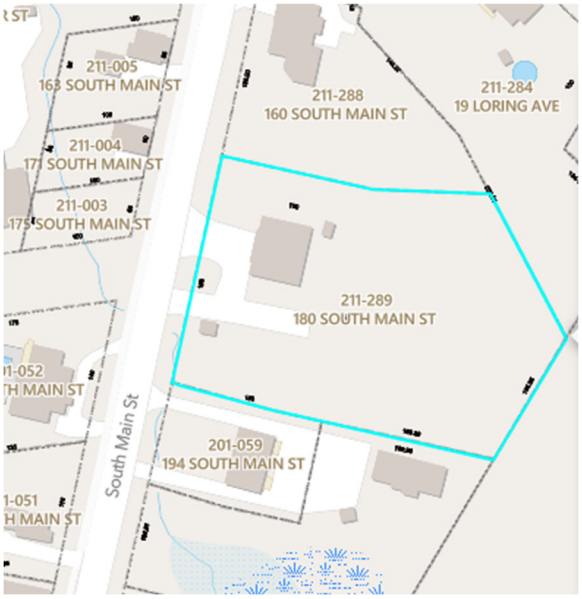
City of Auburn, Maine
Office of Planning & Permitting
www.auburnmaine.gov | 60 Court Street
Auburn, Maine 04210 207.333.6601

To: Auburn Planning Board
From: Natalie Thomsen, Planning Coordinator
Re: Engine II: The Planning Board will host a public hearing and act on a site plan review application submitted by Woodard & Curran on behalf of the City of Auburn proposing a redevelopment of the Auburn Fire Department Engine II public safety project the subject property is located at 180 South Main Street, Tax Map Lot 211-289 and within the T-4.2B - Traditional Neighborhood Development District. The proposed project should be considered pursuant to Chapter 60, Article XVI, Division 2- Site Plan Review, Division 3 – Special Exception,
Date: February 11, 2025



I. PROPOSAL – The City of Auburn, in collaboration with Woodard & Curran, has submitted a Site Plan Review application for the redevelopment of the Auburn Fire Department Engine II public safety project. The project site is located at 180 South Main Street, identified as Tax Map Lot 211-289 within the T-4.2B - Traditional Neighborhood Development District. The proposal includes the demolition of the existing fire station and construction of a new 9,400 square foot fire station adjacent to the current structure. The new facility will include a double apparatus bay, dormitories, kitchen, fitness room, conference room, office space, and decontamination areas. The project will be completed in phases, allowing the existing facility to remain operational during construction. Once the new facility is completed, the existing structure will be demolished, and site improvements will be finalized.

II. ZONING CONSIDERATIONS –

The site is located in the T-4.2B Traditional Neighborhood Development District, which falls under Auburn's Form-Based Code. The proposed use is classified as a Public Safety Facility, which is permitted by Special Exception in this district per **Section 60-554, Form Based Code Use and Parking Matrix.** The project must comply with the district's building placement, configuration, and use regulations, including **Sections 60-556, Form Based Code Plan Types, and 60-548, Form Based Code Development Standards,** which establish parameters for site layout and development intensity.

Per **Section 60-548B.2, Building Frontages T-4.2B**, the standard requires that **primary entrances be oriented towards the street, have a minimum transparency of 40% on the ground floor, and incorporate pedestrian-friendly elements such as canopies or stoops**. The proposed fire station meets this standard by orienting the main entrance towards South Main Street, integrating transparent windows along the public-facing façade, and providing a pedestrian-accessible pathway from the street to the entrance. They are asking for a waiver to reduce the transparency to **34%**, which falls short of the requirement but is justified due to operational needs.

Per **Section 60-548B.3, External Elements T-4.2B**, the standard mandates that **mechanical equipment must be screened from public view, lighting should be designed to avoid glare on adjacent properties, and refuse storage should be enclosed**. The project meets this requirement by incorporating landscaping elements and fencing to screen mechanical units, using full-cutoff light fixtures to prevent light spillover, and enclosing the dumpster area within a dedicated screening enclosure to minimize visual impact.

While the applicant has made efforts to comply with these zoning requirements, some waivers are being requested to accommodate the functional and operational needs of a fire station. These requests are discussed in detail in the waiver section.

Standards Met WITH Issuance of Waivers ✓

III. WAIVER REQUESTS

The applicant has requested waivers from specific zoning requirements due to the existing lot configuration and operational needs of a fire station.

Sec. 60-558. (c) Waiver requests. (1) Any waiver request of form-based code standards and requirements must identify what regulation is being requested for the waiver and include a narrative explaining how the waiver, if approved, will allow the project to meet the purpose of the form-based code and the objective of Section 60-1277, site plan review.

Sec. 60-1277 - Objective.
In considering a site plan, the planning board shall make findings that the development has made provisions for:
(1) Protection of adjacent areas against detrimental or offensive uses on the site by provision of adequate surface water drainage, buffers against artificial and reflected light, sight, sound, dust and vibration; and preservation of light and air.
(2) Convenience and safety of vehicular and pedestrian movement within the site and in relation to adjacent areas.
(3) Adequacy of the methods of disposal for wastes.
(4) Protection of environmental features on the site and in adjacent areas.

1. **Waiver from Section 60-548B.1, Building Placement and Configuration – Front Setback**
    - **Standard:** The maximum front setback allowed is **25 feet**.
    - **Request:** The proposed building is set back **86 feet** from the front property line to accommodate visitor parking, emergency apparatus drive aisles, and site operations.
    - **Suggested Motion:** I make a motion to approve the requested waiver from Section 60-548B.1, Building Placement and Configuration, to allow a front setback of 86 feet where a maximum of 25 feet is permitted.
2. **Waiver from Section 60-548B.2, Building Frontages – Window and Door Coverage**
    - **Standard:** Windows and doors must comprise a minimum of **40%** of the total ground story frontage façade.

- **Request:** The proposed building includes **34%** coverage due to functional needs, energy efficiency, and operational considerations.
- **Suggested Motion:** I make a motion to approve the requested waiver from Section 60-548B.2, Building Frontages, to allow window and door coverage of 34% where a minimum of 40% is required.

3. **Waiver from Section 60-548B.3, External Elements – Parking Location**
   - **Standard:** Parking for commercial developments shall be located to the rear of the property, with side yard parking limited to **60 feet** wide or **40%** of the lot width. Screening is required for parking areas along a street.
   - **Request:** Parking is divided into two dedicated areas: a **68-foot-wide** staff parking area on the west and a **public parking area in front of the building** to allow safe and accessible public access. Screening is provided through plantings.
   - **Suggested Motion:** I make a motion to approve the requested waiver from Section 60-548B.3, External Elements, to allow a parking area of 68 feet in width where a maximum of 60 feet is permitted.

4. **Waiver from Section 60-801, Access Management – Driveway Spacing and Number of Driveways**
   - **Standard:** The minimum spacing for curb cuts and driveways is **150 feet**, with a limit of **one two-way access** per roadway.
   - **Request:** Two curb cuts are proposed, less than 150 feet apart, to separate emergency and public access. The site's limited frontage makes compliance infeasible. Stop signs will be installed for traffic control.
   - **Suggested Motion:** I make a motion to approve the requested waiver from Section 60-801, Access Management, to allow two curb cuts less than 150 feet apart.

5. **Waiver from Section 60-548B.3 and Section 60-607, External Elements and General Provisions – Driveway Width**
   - **Standard:** Driveways shall be a maximum of **20 feet wide**.
   - **Request:** The emergency vehicle driveway is **34 feet wide**, and the public access driveway is **24 feet wide** to accommodate fire apparatus and traffic flow.
   - **Suggested Motion:** I make a motion to approve the requested waiver from Sections 60-548B.3 and 60-607, External Elements and General Provisions, to allow driveway widths of 34 feet and 24 feet where a maximum of 20 feet is permitted.

PARKING & ACCESS MANAGEMENT STANDARDS -

Vehicular access to the site has been designed to accommodate emergency vehicles, with a drive-through double apparatus bay ensuring efficient entry and exit. Parking will be provided on-site for staff and visitors in compliance with **Section 60-608, Off-Street Parking and Loading Standards**. Given that the site is designated for emergency services, the primary concern is ensuring clear and unobstructed access for fire trucks rather than traditional parking.

The project does not meet the threshold for a Traffic Movement Permit under MDOT regulations as it does not generate more than 100 peak-hour trips. However, the site circulation plan has been reviewed by the City Engineer to ensure compliance with **Article X – Access Management Standards,** particularly regarding driveway placement and curb cut regulations. The engineering department recommends the acceptance of the waivers.

Pedestrian access is also considered, with sidewalks and crosswalks designed in accordance with **Section 60-607, Pedestrian Access Standards,** ensuring safe movement within and around the site for personnel and visitors.

Standards Met WITH issuance of waivers%✓

IV. WETLANDS/STORMWATER -
The project will not create more than one acre of new impervious surface, and the stormwater management system has been designed to ensure post-development runoff does not exceed pre-development conditions for the **2, 10, and 25-year storm events**. The applicant has provided a **Stormwater Management Plan**, which has been reviewed by the City' s Engineering Department and found to be compliant with **Sec. 60-1301(10)**

The applicant has designed a **comprehensive stormwater system** that incorporates multiple strategies to manage both water quantity and quality. The system includes **catch basins** strategically placed to collect runoff from impervious surfaces such as paved parking areas and the building roof. These basins direct water into an **underground storm drain system**, which conveys runoff to a **subsurface detention basin**. This basin is designed to temporarily store stormwater and release it at **pre-development flow rates**, ensuring that downstream areas are not adversely affected by increased runoff.

Additionally, **underdrains** are installed beneath paved areas to manage groundwater levels and prevent surface water accumulation. A **foundation drain** around the building perimeter helps mitigate potential infiltration and groundwater pressure, further protecting the facility from water-related damage. To enhance water quality, **oil-water separators** will be installed to filter pollutants from runoff generated in the fire station's apparatus bay, ensuring compliance with environmental protection standards.

To further mitigate environmental impacts, the project includes **low-impact development (LID) practices**, such as the incorporation of green space and vegetative buffers where feasible. These elements aid in reducing runoff volume, filtering pollutants, and improving groundwater recharge. The applicant has also coordinated with the **Auburn Engineering Department** to ensure that stormwater outfalls are properly directed and stabilized to minimize erosion risks.

The revised stormwater plan submitted in response to city comments ensures compliance with **Auburn's stormwater regulations**, and the Engineering Department has reviewed the updated information to confirm that best management practices (BMPs) have been integrated effectively.

Standards Met%✓

V. OTHER PERTINENT ITEMS -
The project includes a **lighting plan** utilizing **full cut-off LED wall packs** mounted on the building to provide adequate illumination while minimizing glare and light spillover. The **photometric plan** complies

with **Sec. 60-607(11), Lighting Standards**, ensuring that lighting is directed downward and does not negatively impact adjacent properties. Additional **pole-mounted lighting** is planned for the parking area to enhance visibility and security.

A **waste management plan** has been submitted, detailing that sewage will be connected to the **Auburn Water and Sewerage District main**, and an **oil-water separator** will be installed in the apparatus bay to manage hazardous materials. A **dedicated dumpster pad** is included for periodic waste disposal. The dumpster area will be enclosed with an **8-foot-high privacy-screened chain-link fence** to reduce visual impacts and contain debris

Landscaping improvements include **low-maintenance plantings** that provide screening while maintaining visibility for emergency vehicles. The landscaping plan includes **shrubs and small trees** in designated areas, focusing on enhancing site aesthetics while ensuring open sight lines for emergency response operations. Some existing vegetation will be preserved where feasible

VI. DEPARTMENT REVIEW-

a. Police- ✓

b. Auburn Water and Sewer- ✓

c. Fire Department/Code Enforcement – ✓

d. Engineering – Current conditions are roughly two entrances of 36' and 50' and understand the need to keep the public separated from emergency responders. Crash data from the immediate area does not indicate an issue with the two entrances as they are currently laid out . The proposed driveways are a slight improvement to existing conditions and would support the waivers.

e. Public Services- ✓

f. Airport – ✓

VII. PLANNING BOARD ACTION- The proposed project requires review and findings for approval of Sections 60-1277 and 60- 1336 :

A. Site Plan Review, Section 60-1277:

1. Does the site plan protect adjacent areas against detrimental or offensive uses on the site by provision of adequate surface water drainage, buffers against artificial and reflected light, sight, sound, dust and vibration; and preservation of light and air?
2. Is the convenience and safety of vehicular and pedestrian movement within the site and in relation to adjacent areas adequately addressed?
3. Are the proposed methods of disposal for wastes adequately addressed?
4. Does the site plan provide adequate protection of environment features on the site and adjacent areas?

B. Special Exception, Section 60-1336. - The board shall require evidence of the following:

1. That the special exception sought fulfills the specific requirements, if any, set forth in the zoning ordinance relative to such exception.
2. That the special exception sought will neither create nor aggravate a traffic hazard, a fire hazard or any other safety hazard.
3. That the special exception sought will not block or hamper the master development plan pattern of highway circulation or of planned major public or semipublic land acquisition.

4. That the exception sought will not alter the essential characteristics of the neighborhood and will not tend to depreciate the value of property adjoining and neighboring the property under application.
5. That reasonable provisions have been made for adequate land space, lot width, lot area, stormwater management in accordance with section 60-1301 (14), green space, driveway layout, road access, off-street parking, landscaping, building separation, sewage disposal, water supply, fire safety, and where applicable, a plan or contract for perpetual maintenance of all the common green space and clustered off-street parking areas to ensure all such areas will be maintained in a satisfactory manner.
6. That the standards imposed are, in all cases, at least as stringent as those elsewhere imposed by the city building code and by the provisions of this chapter.
7. That essential city services which will be required for the project are presently available or can be made available without disrupting the city's master development plan.

VIII. STAFF RECOMMENDATIONS -

Staff recommends the Planning Board find that the Site Plan for the proposed development, meets the requirements of Sec. 60-1277, and further that the application meets the requirements of Special Exception Law, Sec. 60-1336, and APPROVE the project application. Staff recommends the following conditions:

- *No development activity until any bonding or inspection fees are determined by the Auburn Engineering Department.*
- *Blasting permit in advance of blasting from the City of Auburn, Planning, Permitting and Code Department.*

Suggested Motions:

I make a motion that the proposal meets the requirements of Sections 60-1277 and 60- 1336 and approve the Site Plan by Woodard & Curran for the phased construction f a new 9,400 square foot fire station adjacent to the current structure. The new facility will include a double apparatus bay, dormitories, kitchen, fitness room, conference room, office space, decontamination areas, and other associated improvements at180 South Main Street, Tax Map Lot 211-289. The proposed project has met the standards pursuant to Chapter 60, Article XVI, Division 2- Site Plan Review and Division 3 – Special Exception with the following conditions:

A. *No development activity until any bonding or inspection fees are determined by the Auburn Engineering Department.*
B. *Blasting permit in advance of blasting from the City of Auburn, Planning, Permitting and Code Department.*

Natalie Thomsen
Planning Coordinator

AUBURN ENGINE 2 FIRE STATION

DEVELOPMENT REVIEW APPLICATION

180 South Main Street
Auburn, Maine

Prepared by:
Woodard & Curran, Inc.
12 Mountfort Street
Portland, ME 04101

woodardcurran.com

0233981.14
December 2024

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1. PROJECT SUMMARY

On behalf of the City of Auburn (Applicant), Woodard & Curran (W&C) is pleased to submit this Development Review Application for the construction of a new Engine 2 Fire Station (the Project) located at 180 South Main Street in Auburn, Maine (the Site).

The Project will include demolition of the existing fire station building, and construction of a new approximately 9,400 SF fire station building on the same property as the existing station. The new station will be constructed adjacent to the existing station building, to allow for the existing station to remain in operation during construction of the new facility. The construction will be phased such that once the new building is complete, operations will shift into the new facility, and the existing station will be demolished. Once the existing station is demolished, the remainder of the site improvement work will be completed. The new station will include a drive-through double apparatus bay, fitness room, kitchen, conference room, office, dormitories, and supporting spaces such as equipment rooms, turn-out gear room, and decon areas.

The approximately 1.75-acre Site is located in the T-4.2B Traditional Neighborhood zoning district and is subject to the Form Based Code of the City of Auburn Land Use Ordinance.

Figure 1-1: Site Location

1.1 Development Review Application

The Development Review Application requires the following documents for submission:

- Development Review Application Form (included in Attachment 01)
- Development Review Checklist (included in Attachment 02)
- Evidence of Tight, Title and Interest (included in Attachment 03)
- Permit Drawings (included in Attachment 04)
- A Cover Letter stating the nature of the project (this narrative)

1.2 Application Fees

The City of Auburn Planning & Permitting Fee Schedule (January 2022 revision) indicates a Site Plan Review fee of $700 for major projects. The City has determined that the Project is exempt from the Site Plan Review fee, as shown in Attachment 01.

2. EVIDENCE OF RIGHT, TITLE & INTEREST

2.1 Right, Title & Interest

The Project will occur on a portion of the parcel of land identified by the City as Map 211, Lots 288 & 289. The parcel is owned by the City of Auburn. A copy of the deeds, Book 669, Page 170, Book 1045, Page 363, and Book 11534, Page 81, are included in Attachment 03.

Although not required, a list of properties abutting and within 500 feet of the Engine 2 station has been provided for this application. The site's zoning and abutting properties are shown in Figure 2-1 below. A GIS Parcel Map and list of properties abutting the project area are included in Attachments 05 and 06.

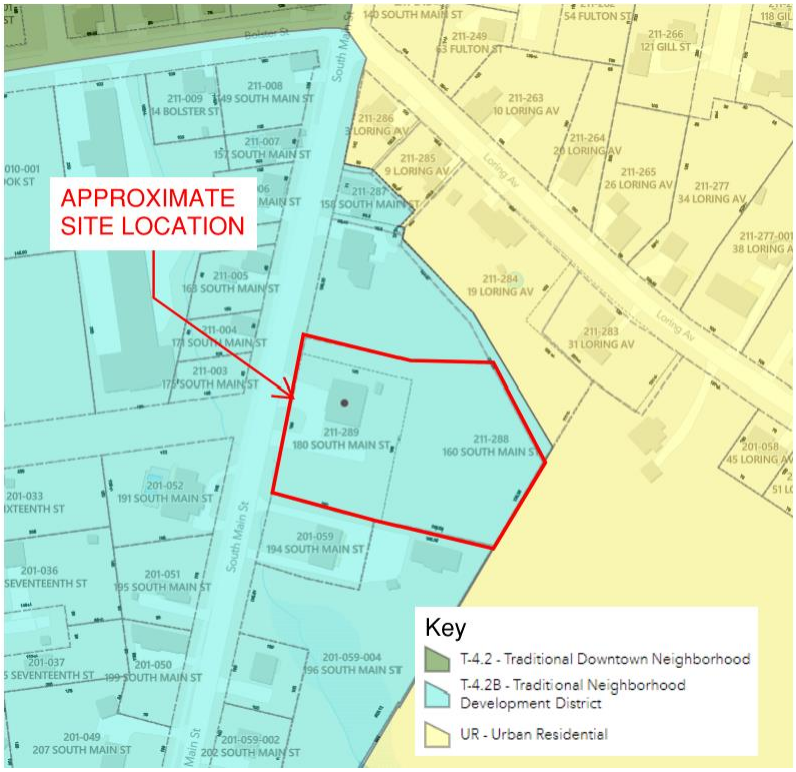


Figure 2-1: General Overview of Site Zoning and Abutters from City of Auburn GIS

2.2 Easements & Other Burdens

There are no known easements on the property.

3. SITE PLAN REVIEW ORDINANCE

3.1 Applicability

Per the City of Auburn Code of Ordinances, Chapter 60, Article IV, Division 14, Section 60-556, the Project will require review by the Planning Board for Special Exception and Site Plan Review, and will seek waivers from the adopted form-based code regulating developing standards.

The Project is considered a Civil Use of Public Safety Services, which is a use allowed by Special Exception in the Form Based Code Traditional Neighborhood T-4.2B (per Sec. 60-554, Form based code and parking matrix table).

3.2 Submission Requirements

Section 60-1301. (1)-(24) of the Ordinance lists submission requirements for Site Review Applications as listed below in *italics*, followed by a description of the materials provided.

1. *General information including the following:*

    a. *Name and address of the owner and developer*

    Owner & Applicant:
    City of Auburn, Maine
    60 Court Street
    Auburn, ME 04210
    (207)-333-6601 Ext. 2156
    Attn: Dan Goyette, Director of Engineering

    Applicant Agent:
    Woodard & Curran, Inc.
    12 Mountfort Street
    Portland, ME 04101
    (207) 558-3707
    Attn: Caitlin Glass, PE, Project Manager

2. *Name of development, scale, and meridian arrow, with specific definition of representation, date of plan and legend.*

    Drawings with this information are included in Attachment 04.

3. *Names and addresses of all owners of record of all adjacent property as appear on assessor's records.*

    A List of Abutters is provided in Attachment 06.

4. *Zoning boundaries and 100-year floodplain boundaries including surrounding areas to a distance of 300 feet from the perimeter of the property.*

   A copy of the City of Auburn GIS Map showing the zoning for site and surrounding areas is included in Attachment 05. The project is outside of the 100-year floodplain. A firmette showing the site and surrounding areas is provided as Attachment 07.

5. *Easements; rights-of-way, existing, planned or proposed; or other reservations adjacent to or intersecting the property.*

   There are no existing or proposed easements anticipated as part of the project.

6. *Topographic map of the site, containing the following:*

   a. *Existing contours, where the slope of existing ground surface is generally two percent or more, the topographic map shall show contours at intervals of five feet of elevation (or lesser intervals as the planning board or engineering department may prescribe). Where the slope of the existing ground surface is generally less than two percent, contour intervals of one foot shall be shown. These contours shall not be copied from the city topographic maps and shall be determined from an on-site survey certified by a registered land surveyor.*

   b. *Proposed contours shall be shown at intervals to be determined by the city engineer.*

      Existing topography based on a survey performed by Main-Land Development Consultants, Inc. is shown on Drawing C-0-101. Proposed contours are shown on Drawing C-0-104. See Attachment 04.

7. *The location of watercourses, wetlands, marshes, surface water, rock outcroppings, wooded areas, single trees with a diameter of ten inches measured three feet from the base of the trunk –*

   An Existing Conditions Plan showing the approximate limits of the wetlands, wooded areas, and single trees with diameter greater than or equal to ten inches is included as Attachment 04, Sheet C-0-101.

8. *Location of buildings existing on the tract to be developed and on adjacent tracts within a distance of 100 feet from the property line, indicating whether existing buildings on the tract are to be retained, modified or removed.*

   A Site Preparation and Demolition Plan showing the demolition scope for the project is included in Attachment 04, Sheet C-0-102.

9. *The location of water mains, sewer mains, wells, fire hydrants, culverts, drains, pipe sizes, grades and direction of flow. existing within 200 feet of the subject property.*

   An Existing Conditions Plan for the project is included in Attachment 04, Sheet C-0-101.

10. *Existing soil conditions and soil suitability test results.*

    A Soils Map and Geotechnical Report prepared by SW Cole Engineering are appended to the Stormwater Management Report, included as Attachment 08.

11. *Locations of proposed buildings and uses thereof.*

    A Layout and Materials Plan for the project is included in Attachment 04, Sheet C-0-103. Preliminary architectural drawings have also been included in Attachment 04 for reference.

12. *Proposed traffic circulation system:*

    a. *Including streets, parking lots, driveways and other access and egress facilities, curb lines, sidewalk lines and existing streets.*

       A Layout and Materials Plan showing this information is included in the Drawings, Attachment 04, Sheet C-0-103.

    b. *Including the projected traffic flow patterns into and upon the site for both vehicles and pedestrians and an estimate of the projected number of motor vehicle trips to and from the site for an average day and for peak hours.*

       The proposed site is a redevelopment with the same use. There are no anticipated traffic pattern changes.

13. *The location of existing and proposed public utility lines: indicating whether proposed lines will be placed underground.*

    A Utility Plan for the project is included in Attachment 04, Sheet C-0-105.

14. *Site developments requiring stormwater permits pursuant to 38 M.R.S.A. § 420-D shall include the required plan and to the extent permitted under 38 M.R.S.A. § 489-A, be reviewed under the procedures of article XVI of this chapter; and they shall meet and comply with 38 M.R.S.A. § 484(4-A) and those Rules promulgated by the Maine Department of Environmental Protection pursuant to the Site Law and section 420-D, specifically Rules 500, 501 and 502, as last amended August 12, 2015. If a project proposes infiltration and the standards in Rule 500, appendix D are not met, then a waste discharge license may be required from the Maine Department of Environmental Protection. An infiltration system serving a development regulated under the Site Location of Development Act may be required to meet standards in addition to those in appendix D.*

    The project is required to manage stormwater on the Site in accordance with applicable Maine Department of Environmental Protection (DEP) and City of Auburn regulations. The project will disturb approximately 1.35 acres and result in approximately 0.65 acres of impervious area, inclusive of a net increase of approximately 0.43 acres of impervious area. Therefore, the project requires compliance with the Basic Standards (erosion and sedimentation control) of DEP's Chapter 500 Stormwater Regulations.

    The project does not exceed DEP or City of Auburn thresholds for the general standard (stormwater quality treatment) or the flooding standard (stormwater quantity) of DEP Chapter 500 stormwater regulations. The project is not located within the direct watersheds of Lake Auburn or Taylor Pond; therefore, compliance with the City's phosphorous control standard is not required. The proposed stormwater conveyance system will be sized to convey the 25-year storm and the proposed site has been designed to mitigate peak discharge flow rates for the 25-year storm event to prevent adverse impacts to the downstream stormwater infrastructure in compliance with City of Auburn Code of Ordinances Sec. 46-210(a)(3).

Proposed stormwater management systems are shown on the Grading Plan, Attachment 04, C-0-104. Additional information is included in the Stormwater Management Report, Attachment 08

15. *The location and design of proposed off-street parking and loading areas. indicating number and size of stalls.*

    A Layout and Materials Plan showing this information is included in the Drawings, Attachment 04, Sheet C-0-103.

16. *Proposed location and direction of and time of use of outdoor lighting.*

    Outdoor lighting will be provided to light the parking areas outside of the building and will be either building mounted or provided by light poles. The outdoor lighting will be used daily from dusk to dawn and from 4 PM to 6 AM during the winter. The lighting plan and additional information is included Attachment 13.

17. *Existing and proposed planting, fences and walls.*

    a. *Including all landscaping and screening; indicating existing trees to be retained and areas to be left undisturbed.*

       An Existing Conditions Plan for the project is included in Attachment 04, Sheet C-0-101.

    b. *Including design features intended to integrate the proposed new development into the existing landscape to enhance aesthetic assets and to screen objectionable features from neighbors.*

       A Layout and Materials Plan showing this information is included in the Drawings, Attachment 04, Sheet C-0-103.

18. *The location, size, design, and manner of illumination of signs.*

    Not applicable; no illuminating signs are proposed.

19. *The disposal location of sewage, trash, solid waste, oil waste, hazardous waste or radioactive waste showing disposal facilities, receptacles, or areas.*

    Sewage from the proposed building will tie into the existing Auburn Water and Sewerage District sewer main, as shown on the Utility Plan, Attachment 04, C-0-105. An oil water separator is proposed for the floor drains within the apparatus bay. An on-site dumpster pad has been included in the design to allow for periodic removal and storage of on-site solid waste.

    Excess soil that may be generated during construction will be disposed of in accordance with Maine Department of Environmental Protection (DEP) solid waste regulations, with the most likely receiving facility being a Maine DEP licensed landfill.

    The Contractor will be responsible for legal disposal of any oil waste during construction. W&C does not anticipate any other hazardous or radioactive wastes from the construction of this project.

20. *Perimeter boundaries of the site giving complete descriptive lot data by bearings, distances, and radii of curves including the name and seal of the registered land surveyor who prepared the plan.*

    Perimeter boundaries are shown on the Boundary Survey & Abutter Conveyance plan, prepared by Main-Land Development Consultants, Inc. dated June 14, 2023, included in attachment 04.

21. *Description and plan of capacity and location of means of sewage disposal together with approval of sewer district engineer or evidence of soil suitability for such disposal (test pit locations shall be shown on the plans) similarly approved by the city engineer department.*

    Not applicable; no on-site sewage disposal is proposed. Sewage will be disposed of via a sanitary sewer service connected to the existing Auburn Water and Sewerage District sewer.

22. *A statement of the amount of area of land involved in the site including:*

    a. *The percentage of the site proposed to be covered by buildings.*

       The proposed building lot coverage is approximately 12%

    b. *The total number of dwelling units proposed per acre.*

       No dwelling units are proposed as part of the Project.

    c. *The area proposed to be devoted to open space.*

       Approximately 11% of the proposed site qualifies as useable open space.

    d. *The area proposed to be paved for parking, driveways, loading space and sidewalks.*

       Approximately 18,580 square feet of impervious area is being proposed for parking, drive aisles, walkways, a dumpster pad, equipment pads, a patio, and gravel surfaces..

    e. *The total number of parking spaces required by the zoning chapter for the uses proposed.*

       The existing Engine 2 Fire Station has space for approximately 6 parked vehicles in an existing paved driveway southwest of the building. The proposed Engine 2 facility will include 7 parking spaces in a paved lot to the north of the new building for employee parking, and 3 parking spaces in a paved lot to the west of the building for public and visitor parking, including an accessible parking space.

    f. *The number of employees expected per shift and the total floor area of proposed commercial or industrial uses.*

       It is anticipated that there will be 6 staff members at the station per shift

23. *Description and plan of a phase development concept detailing the areas and sequence of phasing.*

    The construction will be completed in three phases: (1) installation of all erosion and sediment control, construction of the stormwater detention system, and construction of access road; (2)

construction of the new fire station building; (3) demolition of existing fire station building and construction of the remaining site work.

24. *A statement by the developer assuring that he has the financial capabilities to fully carry out the project and to comply with the conditions imposed by the planning board.*

    W&C understands that the City of Auburn has financial capacity to manage the Project as a result of successful bonding in fiscal year 2025 and approved Capital Improvement Plan to bond the additional funds to complete the project in fiscal year 2023 as indicated in a letter from the City of Auburn Finance Director included in Attachment 09.

3.3 Development Review Checklist Requirements

The Development Review Checklist lists submission requirements for an application. Several of these requirements have been discussed herein and conformance has already been demonstrated. This section discusses all other Development Review Checklist Requirements in *italics*, followed by descriptions of the relevant materials provided in this application:

1. *Site Plan*

   Most of the requirements listed on the checklist are addressed in the narrative herein or on the Drawings included in Attachment 04. Responses to other checklist requirements are provided below.

   a. *Airport Area of Influence.*

      Not Applicable. The project site is outside of the Airport Area of Influence as shown in Figure 3-1 below.

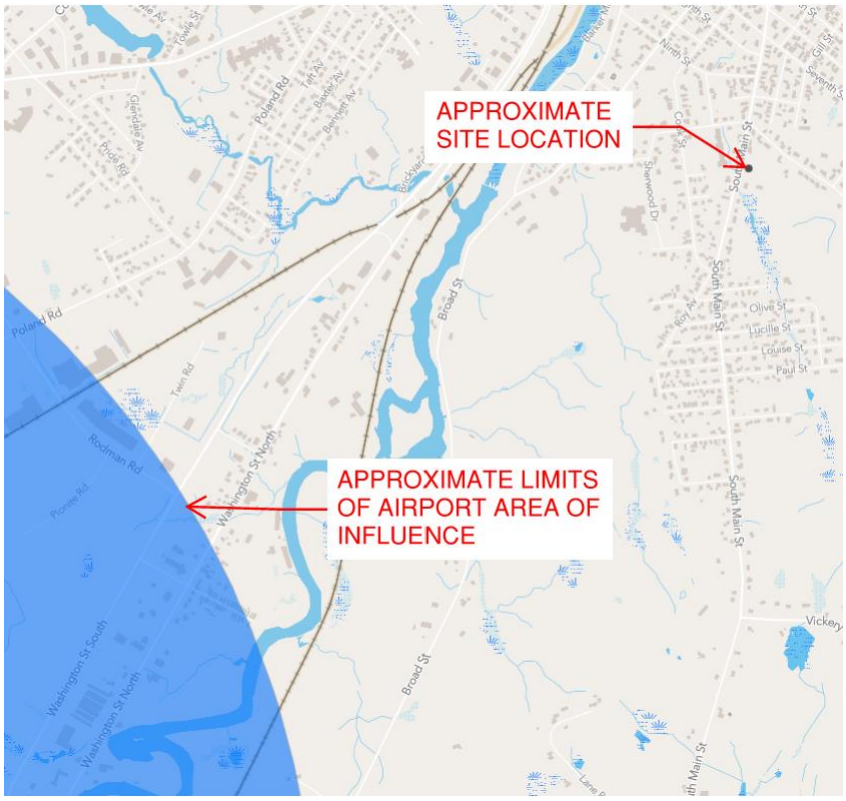


Figure 3-1: Airport Area of Influence Overview from City of Auburn GIS

   b. *Subdivision Restrictions*

      Not Applicable.

   c. Fire Department Review

The City of Auburn Fire and Police Departments will review this application as part of the Site Plan Review process.

2. *Landscape Plan*

Most of the requirements listed on the checklist are addressed in the narrative herein or on the Drawings included in Attachment 04. Responses for other checklist requirements are provided below.

a. *Greenspace Requirements*

The proposed design will result in excess of the 10% minimum useable open space. Useable open space is defined as "open or **green space** [emphasis added] that is accessible for the use and enjoyment of residents…"

b. *Setbacks to Parking*

All permanent parking areas are separated from adjacent property lines by drive aisles as shown on Drawing C-0-103, Attachment 04.

c. *Street Tree Requirements*

Not Applicable.

3. *Stormwater & Erosion Control Plan*

Most of the requirements listed on the checklist are addressed in the narrative herein or on the Drawings included in Attachment 04. Responses for other checklist requirements are provided below.

a. *Maine Construction General Permit*

The final contract documents will require the Contractor to obtain all applicable construction permits and discharge stormwater from construction activities in accordance with the Maine Construction General Permit.

b. *Bonding and Inspection Fees*

Based on discussions with the City, a bonding and inspection fee will be dependent on the construction cost and will require ongoing coordination with the City for implementation prior to construction. The Applicant has requested this requirement be waived from the Application but will continue to coordinate a bonding and inspection fee for the contractor prior to construction.

4. *Traffic Information*

Most of the requirements listed on the checklist are addressed in the narrative herein or on the Drawings included in Attachment 04. Responses for other checklist requirements are provided below.

a. *Access Management*

The proposed site is a redevelopment with the same use and a similar access configuration to the existing condition. There are no anticipated traffic pattern changes.

b. *Signage*

Stop signs have been proposed for traffic leaving the site as shown on the Layout and Materials Plan, Attachment 04, C-0-103.

c. *PCE – Trips in Peak Hours*

The proposed site is a redevelopment with the same use. There are no anticipated traffic pattern changes.

d. *Vehicular Movements*

The proposed site has been designed to accommodate fire apparatus turning.

e. *Safety Concerns*

Not Applicable.

f. *Pedestrian Circulation*

The proposed site includes a separate parking area for pedestrians to visit the fire station. An accessible route has been designed from the parking area to the entrance of the building.

g. *Police Traffic*

The City of Auburn Police Department will review this application as part of the Site Plan Review process.

h. *Engineering Traffic*

The proposed site is a redevelopment with the same use. There are no anticipated traffic pattern changes.

5. *Utility Plan*

The majority of requirements listed on the checklist are addressed in the narrative herein or on the Drawings included in Attachment 04. Responses for other checklist requirements are provided below.

a. *Adequacy of Water Supply*

The Auburn Water and Sewerage District has confirmed that the existing watermain has enough capacity to service the proposed demands as indicated in the 4 December 2024 email included in Attachment 10.

b. *Watermain extension agreement*

Not Applicable.

c. *Available City sewer capacity*

The Auburn Water and Sewerage District has confirmed that the existing sewer line has enough capacity to service the proposed demands as indicated in the 4 December 2024 email included in Attachment 10.

6. *Natural Resources*

a. *Shoreland Zone*

Not Applicable. The project site is outside of the Shoreland Zone as shown in Figure 3-2 below.

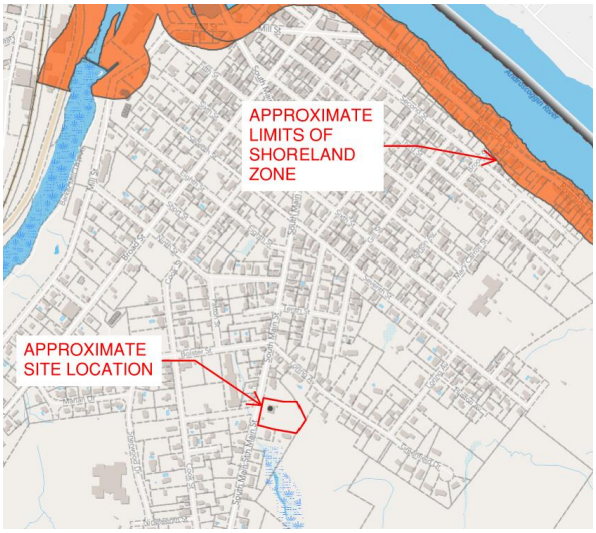


Figure 3-2: Shoreland Zone Overview from City of Auburn GIS

b. Flood Plain

Not Applicable. The project site is outside FEMA identified Flood Zones as shown in Attachment 07.

c. Wetlands or Streams

FB Environmental Associates performed a wetland investigation for the site in March 2023 and found two wetland areas and one ditch. A memo summarizing FB Environmental Associates' findings is included in Attachment 11.

d. Urban Impaired Stream

Not Applicable. Based on the Maine Urban Impaired Stream Watersheds GIS, the project site is not located within an Impaired Stream Watershed as shown below in Figure 3-3.

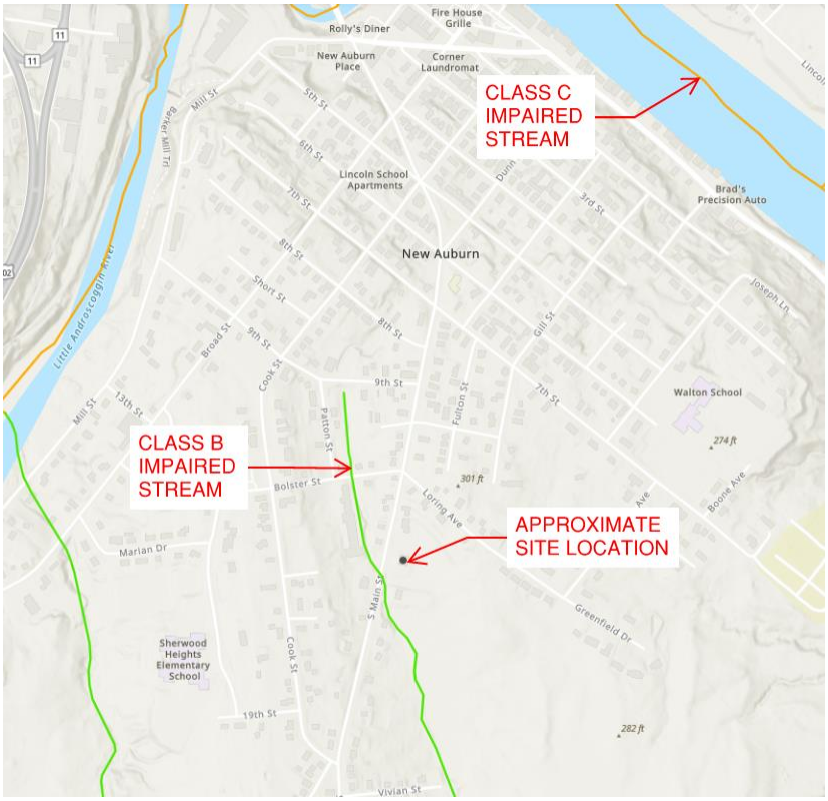


Figure 3-3: Maine Urban Impaired Stream Watersheds Overview from MaineDEP GIS

e. Phosphorus Check

The project is not located within the direct watersheds of Lake Auburn or Taylor Pond; therefore, the City's phosphorous control standard is not required.

f. Aquifer/ Groundwater Protection

The project site is outside of any Significant Sand and Gravel Aquifers as defined by Maine Geological Survey Open-File No. 99-22, included as Attachment 12.

g. Applicable State Permits

A Tier 2 NRPA will be submitted to DEP for the Project, as well as a Maine Construction General Permit (MCGP), as the disturbance area will be greater than one acre.

h. Lake Auburn Watershed

Not Applicable. The project site is outside of the Lake Auburn Watershed as shown in Figure 3-4 below.

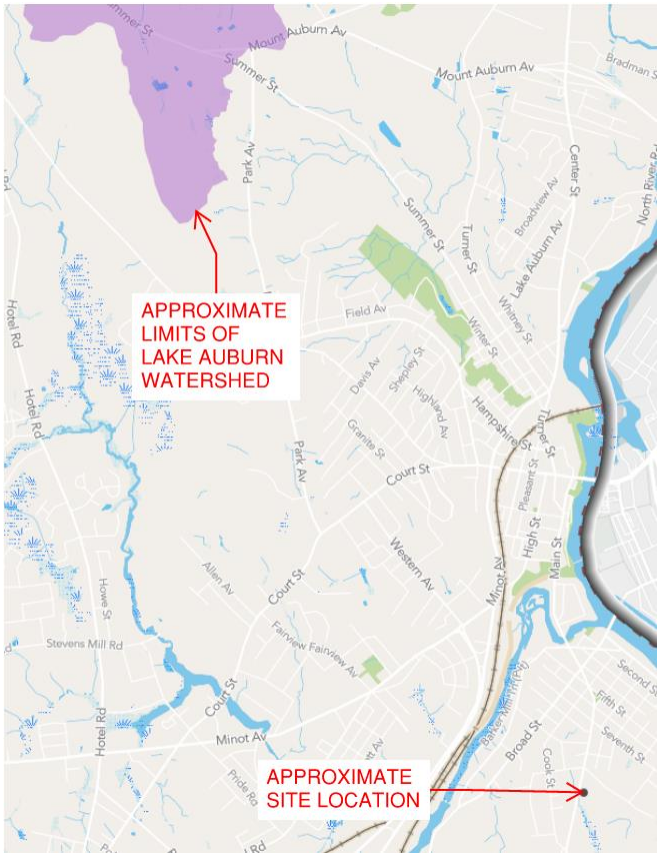


Figure 3-4: Lake Auburn Watershed Overview from City of Auburn GIS

i. Taylor Pond Watershed

Not Applicable. The project site is outside of the Taylor Pond Watershed as shown in Figure 3-5 below.

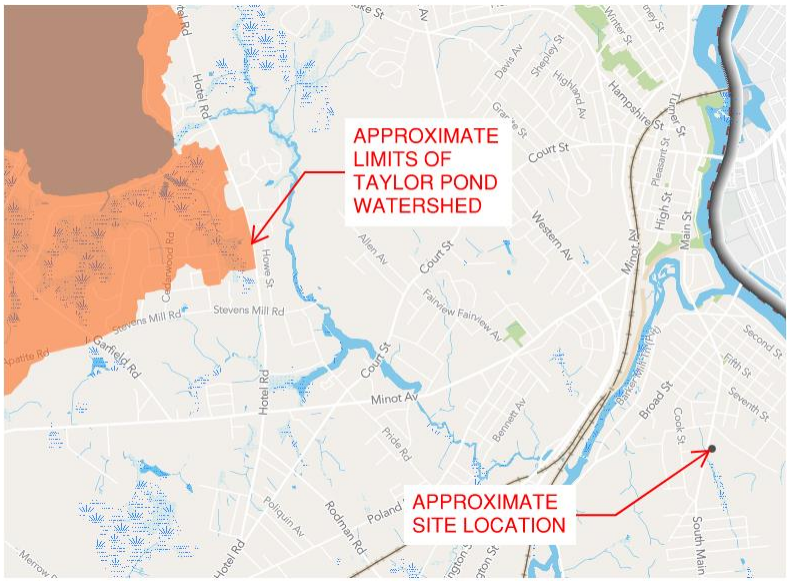


Figure 3-5: Taylor Pond Watershed Overview from City of Auburn GIS

7. Subdivision Law and Additional Subdivision Standards.

Not Applicable.

ATTACHMENT 01: DEVELOPMENT REVIEW APPLICATION FORM

City of Auburn, Maine
Office of Planning & Permitting
Eric J. Cousens, Director
60 Court Street | Auburn, Maine 04210
www.auburnmaine.gov | 207.333.6601

Development Review Application

PROJECT NAME: Auburn Engine #2 Station

PROPOSED DEVELOPMENT ADDRESS: 180 S Main St, Auburn, ME 04210

PARCEL ID #: 211-289

REVIEW TYPE:
Site Plan ☑ Site Plan Amendment □
Subdivision □ Subdivision Amendment □

PROJECT DESCRIPTION: The proposed Engine #2 Station will be located on the same property as the existing station at 180 S Main St as shown in Figure 1-1 below . The new station will be constructed adjacent to the existing station building, to allow for the existing station to remain in operation during construction of the new facility. The construction will be phased such that once the new building is complete, operations will shift into the new facility, and the existing station will be demolished. Once the existing station is demolished, the remainder of the site improvement work will be completed. The new station will include a drive-through double apparatus bay, fitness room, kitchen, conference room, office, dormitories, and supporting spaces such as equipment rooms, turn-out gear room, and decon areas.

The approximately 1.75-acre Site is located in the T-4.2B Traditional Neighborhood zoning district and is subject to the Form Based Code of the City of Auburn Land Use Ordinance.

Name: Dan Goyette (City of Auburn)
Address: 60 Court Street
City / State Auburn, ME
Zip Code 04210
Work #: 207-333-6601 Ext. 2156
Cell #:
Fax #:
Home #:
Email: dgoyette@auburnmaine.gov

Name: City of Auburn, Maine
Address: 60 Court Street
City / State Auburn, ME
Zip Code 04210
Work #: 207-333-6601 Ext. 2156
Cell #:
Fax #:
Home #:
Email: dgoyette@auburnmaine.gov

Project Representative
Name: Woodard & Curran, Inc.
Address: 12 Mountfort St
City / State Portland, ME
Zip Code 04101
Work #: (207) 558-3707
Cell #: N/A
Fax #: N/A
Home #: N/A
Email: cglass@woodardcurran.com

Other professional representatives for the project (surveyors, engineers, etc.),
Name:
Address:
City / State
Zip Code
Work #:
Cell #:
Fax #:
Home #:
Email:

PROJECT DATA

The following information is required where applicable, in order complete the application

IMPERVIOUS SURFACE AREA/RATIO

Existing Total Impervious Area	±8,760	sq. ft.
Proposed Total Paved Area	±18,580	sq. ft.
Proposed Total Impervious Area	±28,160	sq. ft.
Proposed Impervious Net Change	±19,400	sq. ft.
Impervious surface ratio existing	±11.5	% of lot area
Impervious surface ratio proposed	±36.9	% of lot area

BUILDING AREA/LOT COVERAGE

Existing Building Footprint	±5,324*	sq. ft.
Proposed Building Footprint	±9,400**	sq. ft.
Proposed Building Footprint Net change	±4,076	sq. ft.
Existing Total Building Floor Area	±5,324*	sq. ft.
Proposed Total Building Floor Area	±9,400**	sq. ft.
Proposed Building Floor Area Net Change	±9,014***	sq. ft.
New Building	±3,690	sq. ft
Building Area/Lot coverage existing	Yes	(yes or no)
Building Area/Lot coverage proposed	±7	% of lot area
	±12	% of lot area

*Existing Building Footprint is based on information provided by the Auburn Maine Advanced Public Parcel Viewer GIS

**Proposed Building Footprint includes roof overhangs area

***Proposed Total Building Floor Area based on First Floor and Mezzanine Floor Area indicated on preliminary Architectural Drawings. This area is subject to change during design development.

ZONING

Existing	T-4.2B
Proposed, if applicable	N/A

LAND USE

Existing	Public Safety Services****
Proposed	Public Safety Services****

****Existing indicated in this table use is based on the use indicated for Parcel 211-289 on the Auburn Maine Advanced Public Parcel Viewer GIS. The proposed use will not change. Land use designations for this site would be categorized as "public safety services" per the City of Auburn's Ordinances, section 60-554. - form based code use and parking matrix

RESIDENTIAL, IF APPLICABLE

Existing Number of Residential Units	N/A
Proposed Number of Residential Units	N/A
Subdivision, Proposed Number of Lots	N/A

PARKING SPACES

Existing Number of Parking Spaces	3 (Paved, Unmarked)
Proposed Number of Parking Spaces	9 (Paved, marked)
Number of Handicapped Parking Spaces	1 (Paved, marked)
Proposed Total Parking Spaces	10 (Paved, marked)

ESTIMATED COST OF PROJECT: $7M

DELEGATED REVIEW AUTHORITY CHECKLIST

SITE LOCATION OF DEVELOPMENT AND STORMWATER MANAGEMENT

Existing Impervious Area	±8,760	sq. ft.
Proposed Disturbed Area	±58,800	sq. ft.
Proposed Impervious Area	±28,160	sq. ft.

1. ***If the proposed disturbance is greater than one acre, then the applicant shall apply for a Maine Construction General Permit (MCGP) with MDEP.***
2. ***If the proposed impervious area is greater than one acre including any impervious area crated since 11/16/05, then the applicant shall apply for a MDEP Stormwater Management Permit, Chapter 500, with the City.***
3. ***If total impervious area (including structures, pavement, etc) is greater than 3 acres since 1971 but less than 7 acres, then the applicant shall apply for a Site Location of Development Permit with the City. If more than 7 acres then the application shall be made to MDEP unless determined otherwise.***
4. ***If the development is a subdivision of more than 20 acres but less than 100 acres then the applicant shall apply for a Site Location of Development Permit with the City. If more than 100 acres then the application shall be made to MDEP unless determined otherwise.***

TRAFFIC ESTIMATE

Total traffic estimated in the peak hour-existing (Since July 1, 1997) N/A passenger car equivalents (PCE)

Total traffic estimated in the peak hour-proposed (Since July 1, 1997) N/A passenger car equivalents (PCE)

If the proposed increase in traffic exceeds 100 one-way trips in the peak hour then a traffic movement permit will be required.

Zoning Summary

1. Property is located in the T-4.2B zoning district.
2. Parcel Area: 1.75 acres / 76,372 square feet(sf).

Regulations	Required/Allowed	Provided
Min Lot Area	N/A	N/A
Street Frontage	N/A	N/A
Min Front Yard	5 ft, min.	±86 ft
Min Rear Yard	10 ft, min.	±134 ft
Min Side Yard	5 ft, min.	±58 ft
Max. Building Height	3 Story max.	2 Story
Use Designation	Public Safety Services*	
Parking Requirement	1 space/ per N/A square feet of floor area	
Total Parking:	10 Spaces	
Overlay zoning districts (if any):	N/A	
Urban impaired stream watershed?	YES/(NO) If yes, watershed name	

*Existing indicated in this table use is based on the use indicated for Parcel 211-289 on the Auburn Maine Advanced Public Parcel Viewer GIS. The proposed use will not change. Land use designations for this site would be categorized as "public safety services" per the City of Auburn's Ordinances, section 60-554. - form based code use and parking matrix

DEVELOPMENT REVIEW APPLICATION SUBMISSION

Submissions shall include fifteen (15) complete packets containing the following materials:

1. 5 Full size plans and 10 smaller (no larger than 11" x 17") plans containing the information found in the attached sample plan checklist.
2. Application form that is completed and signed by the property owner or designated representative. (NOTE: All applications will be reviewed by staff and any incomplete application will not be accepted until all deficiencies are corrected.
3. Cover letter stating the nature of the project.
4. All written submittals including evidence of right, title and interest.
5. Copy of the checklist completed for the proposal listing the material contained in the submitted application.

Refer to the application checklist for a detailed list of submittal requirements.

To view the City of Auburn Zoning Ordinance, go to:
www.auburnmaine.gov under City Departments / Planning, Permitting & Code / Subdivisions / Land Use /Zoning Ordinance

I hereby certify that I am the Owner of record of the named property, or that the owner of record authorizes the proposed work and that I have been authorized by the owner to make this application as his/her authorized agent. I agree to conform to all applicable laws of this jurisdiction. In addition, I certify that the City's authorized representative shall have the authority to enter all areas covered by this permit at any reasonable hour to enforce the provisions of the codes applicable to this permit.

This application is for development review only; a Performance Guarantee, Inspection Fee, Building Permit Application and other associated fees and permits will be required prior to construction.

Signature of Applicant:	Date:
	12.12.2024

Caitlin Suhr

From: Eric Cousens <ECousens@auburnmaine.gov>
Sent: Thursday, November 14, 2024 1:01 PM
To: Caitlin Suhr
Subject: Re: [External]Engine 2 Fire Station Site Plan Review Fee

Yes, Caitlin, we can waive the fee for all local permits and site plan reviews except for Plumbing when we get to that stage.

Eric J. Cousens
Director of Planning and Permitting
60 Court Street | Auburn, Maine 04210 | 207.333.6601 X1154
www.auburnmaine.gov

From: Caitlin Suhr <CSuhr@woodardcurran.com>
Sent: Thursday, November 14, 2024 12:43 PM
To: Eric Cousens <ECousens@auburnmaine.gov>
Subject: [External]Engine 2 Fire Station Site Plan Review Fee

Hi Eric,

We are preparing to submit the Engine 2 Site Plan Review application to the City on December 6, to get on the January 14, 2025 Planning Board meeting agenda.

Can you please confirm that the Site Plan Review application fee would be waived for the project, given that the City is the applicant?

Thank you,
Caitlin

Caitlin Suhr, PE
Project Manager | Associate Principal
Woodard & Curran

ATTACHMENT 02: DEVELOPMENT REVIEW CHECKLIST

City of Auburn, Maine
Office of Planning & Permitting
Eric J. Cousens, Director
60 Court Street | Auburn, Maine 04210
www.auburnmaine.gov | 207.333.6601

Development Review Checklist

The following information is required where applicable to be submitted for an application to be complete

PROJECT NAME: Auburn Engine 2 Fire Station
PROPOSED DEVELOPMENT ADDRESS: 180 Main St, Auburn, ME 04210
PARCEL #: 211-289

Required Information		*Check when Submitted*		*Applicable Ordinance*
Site Plan		*Applicant*	*Staff*	
	Owner's Names/Address	X		
	Names of Development	X		
	Professionally Prepared Plan	X		
	Tax Map or Street/Parcel Number	X		
	Zoning of Property	X		
	Distance to Property Lines	X		
	Boundaries of Abutting land	X		
	Show Setbacks, Yards and Buffers	X		
	Airport Area of Influence	N/A		
	Parking Space Calcs	X		
	Drive Openings/Locations	X		
	Subdivision Restrictions	N/A		
	Proposed Use	X		
	PB/BOA/Other Restrictions	X		
	Fire Department Review	X		
	Open Space/Lot Coverage	X		

Required Information		*Check when Submitted*		*Applicable Ordinance*
Landscape Plan		*Applicant*	*Staff*	
	Greenspace Requirements	N/A		
	Setbacks to Parking	N/A		
	Buffer Requirements	N/A		
	Street Tree Requirements	N/A		
	Screened Dumpsters	X		
	Additional Design Guidelines	N/A		
	Planting Schedule	N/A		
Stormwater & Erosion Control Plan		*Applicant*	*Staff*	
	Compliance w/ chapter 500	X		
	Show Existing Surface Drainage	X		
	Direction of Flow	X		
	Location of Catch Basins, etc.	X		
	Drainage Calculations	X		
	Erosion Control Measures	X		
	Maine Construction General Permit	X		
	Bonding and Inspection Fees	N/A		
	Post-Construction Stormwater Plan	X		
	Inspection/monitoring requirements	X		
Lighting Plan		*Applicant*	*Staff*	
	Full cut-off fixtures	X		
	Meets Parking Lot Requirements	X		
Traffic Information		*Applicant*	*Staff*	
	Access Management	X		
	Signage	X		
	PCE - Trips in Peak Hour	N/A		

Required Information		*Check when Submitted*		*Applicable Ordinance*
	Vehicular Movements	X		
	Safety Concerns	X		
	Pedestrian Circulation	X		
	Police Traffic	X		
	Engineering Traffic	X		
Utility Plan		*Applicant*	*Staff*	
	Water	X		
	Adequacy of Water Supply	X		
	Water main extension agreement	N/A		
	Sewer	X		
	Available city capacity	X		
	Electric	X		
	Natural Gas	X		
	Cable/Phone	X		
Natural Resources		*Applicant*	*Staff*	
	Shoreland Zone	X		
	Flood Plain	X		
	Wetlands or Streams	X		
	Urban Impaired Stream	X		
	Phosphorus Check	X		
	Aquifer/Groundwater Protection	X		
	Applicable State Permits	N/A		
	Lake Auburn Watershed	N/A		
	Taylor Pond Watershed	N/A		
Right, Title or Interest		*Applicant*	*Staff*	
	Verify	X		
	Document Existing Easements, Covenants, etc.	X		

Required Information		*Check when Submitted*		*Applicable Ordinance*
Technical & Financial Capacity		***Applicant***	***Staff***	
	Cost Est./Financial Capacity	X		
	Performance Guarantee			
State Subdivision Law		***Applicant***	***Staff***	
	Verify/Check	N/A		
	Covenants/Deed Restrictions	N/A		
	Offers of Conveyance to City	N/A		
	Association Documents	N/A		
	Location of Proposed Streets & Sidewalks	N/A		
	Proposed Lot Lines, etc.	N/A		
	Data to Determine Lots, etc.	N/A		
	Subdivision Lots/Blocks	N/A		
	Specified Dedication of Land	N/A		
Additional Subdivision Standards		***Applicant***	***Staff***	
	Mobile Home Parks	N/A		
	PUD	N/A		
A JPEG or PDF of the proposed site plan		***Applicant***	***Staff***	
Final sets of the approved plans shall be submitted digitally to the City, on a CD or DVD, in AutoCAD format R 14 or greater, along with PDF images of the plans for archiving				

ATTACHMENT 03: EVIDENCE OF RIGHT, TITLE & INTEREST

Bk 11534 Pg81 #3071
03-01-2024 @ 02:49p

AFTER RECORDING RETURN TO:
Jeffrey B. Herbert, Esq.
Jensen Baird Gardner & Henry
P.O. Box 4510
Portland, Maine 04112-4510

WARRANTY DEED
Maine Statutory Short Form
DLN: 1002440266127

KNOW ALL PERSONS BY THESE PRESENTS that **DIANE LABONTE**, whose address is 160 South Main Street, Auburn, Maine 04210, for consideration paid, grants to the **CITY OF AUBURN**, a municipal corporation existing under the laws of the State of Maine whose address is 60 Court Street, Auburn, Maine 04210, WITH WARRANTY COVENANTS, that certain property located in the City of Auburn, County of Androscoggin and State of Maine, being more particularly described on Exhibit A attached hereto and made a part hereof.

IN WITNESS WHEREOF, Diane Labonte has caused this instrument to be executed and delivered this 1st day of March, 2024.

WITNESS:

Diane M Labonte
Diane Labonte

STATE OF MAINE
COUNTY OF CUMBERLAND, ss. March 1, 2024

Then personally appeared the above-named Diane Labonte and acknowledged the foregoing instrument to be her free act and deed.

Before me,

~~Notary Public~~ Attorney-At-Law
Print Name: Jeffrey B. Herbert
Bar No: 009965

EXHIBIT A

A certain lot or parcel of land, situated on the easterly side of South Main Street, so-called, in the City of Auburn, County of Androscoggin, and State of Maine, being more particularly bounded and described as follows, to wit:

Beginning at a point on the easterly side of South Main Street at the northwesterly corner of land now or formerly of the Grantee herein (Book 669, Page 170);

Thence, from the Point of Beginning, North 12° 44' 40" East, along the easterly side of South Main Street, a distance of 30.00 feet to a 5/8 inch rebar capped "Buker 2397", to be set;

Thence, South 77° 06' 04" East, along remaining land of the Grantor herein, a distance of 148.76 feet to a 5/8 inch rebar capped "Buker 2397", to be set;

Thence, South 87° 22' 24" East, along said remaining land of the Grantor herein, a distance of 112.15 feet to a 5/8 inch rebar capped "Buker 2397", to be set, on the westerly side of land now or formerly of Robert R. & Diana K. Pontbriand (Book 6469, Page 316);

Thence, South 27° 41' 47" East, along land now or formerly of Pontbriand, a distance of 156.26 feet to a 5/8 inch rebar capped "PLS 1278" on the northwesterly side of land now or formerly of James E. & Steven M. Pollard (Book 6627, Page 324);

Thence, South 31° 24' 15" West, along land now or formerly of Pollard, a distance of 136.36 feet to a 5/8 inch rebar on the northeasterly corner of land now or formerly of JFM No. 3 Corp (Book 7824, Page 274);

Thence, North 77° 10' 05" West, along land now or formerly of JFM No. 3 Corp, a distance of 169.14 feet to a 5/8 inch rebar on the southeasterly corner of other land now or formerly of the Grantee herein (Book 1045, Page 363);

Thence, North 13° 00' 37" East, along said other land now or formerly of the Grantee herein and said land now or formerly of the Grantee herein, a distance of 198.16 feet to a 5/8 inch rebar capped "PLS 1278";

Thence, North 77° 06' 04" West, along said land now or formerly of the Grantee herein, a distance of 148.76 feet to the Point of Beginning.

The above-described parcel of land contains 1.08 acres, more or less.

All bearings are referenced to Maine State Grid, West Zone, NAD 83 and based on a plan entitled, "Plan showing a Standard Boundary Survey & Abutter Conveyance Engine 2 Fire

Station City of Auburn", dated June 9, 2023, made for the City of Auburn, surveyed by Main-Land Development Consultants, Inc.

All Book and Pages refer to the Androscoggin County Registry of Deeds.

Meaning and intending to convey a portion, and only a portion, of a parcel of land conveyed from George E. Richardson and Robert L. Pontbriand, duly appointed and acting as co-personal representatives of the Estate of Fernand L. Pontbriand to James Labonte and Diane Labonte, by a deed dated October 29, 2004, and recorded in Book 6123, Page 131 on November 1, 2004. James Labonte died August 8, 2016, leaving Diane Labonte as the surviving joint tenant.

Know all Men by these Presents,

$ 2.20 Doc. Rev. Stamps Cancelled

That we, Arthur J. Pontbriand and Ida A. Pondbriand, both of Auburn, in the County of Androscoggin and State of Maine in consideration of one dollar and other valuable consideration paid by City of Auburn, a municipal corporation located in Androscoggin and State of Maine the receipt whereof we do hereby acknowledge, do hereby give, grant, bargain, sell, and convey unto the said City of Auburn, its successors and assigns forever a certain lot or parcel of land situated in said Auburn, and bounded and described as follows, to wit: Beginning at a point on the easterly line of South Main Street, two hundred (200) feet southerly from the southerly line of land of Wilfred L. Chandler and Velma Chandler; thence southerly one hundred (100) feet by the easterly line of South Main Street; thence easterly at right angles with the easterly line of South Main Street one hundred fifty (150) feet; thence northerly and parallel with the easterly line of South Main Street one hundred (100) feet; thence westerly one hundred fifty (150) feet to the easterly line of South Main Street at the point of beginning.

Being part of the same premises conveyed to us by Katherine M. Small, by deed dated June 23, 1944, and recorded in Book 550, Page 93.

To Have and to Hold the aforegranted and bargained premises, with all the privileges and appurtenances thereof, to the said City of Auburn, its successors and assigns to its and their use and behoof forever. And we do covenant with the said Grantee, its successors and assigns, that we are lawfully seized in fee of the premises; that they are free of all incumbrances; that we have good right to sell and convey the same to the said grantee to hold as aforesaid; and that we and our heirs shall and will warrant and defend the same to the said Grantee, its successors and assigns forever, against the lawful claims and demands of all persons.

In Witness Whereof, we the said Arthur J. Pontbriand and Ida A. Pondbriand, husband and wife, joining in this deed as Grantors, and relinquishing and conveying our right by descent and all other rights in the above described premises have hereunto set our hands and seals this - - - - - day of - - - - in the year of our Lord one thousand nine hundred and fifty-two.

Signed, Sealed and Delivered in the Presence of

Laureat E. Roy — Arthur J. Pontbriand (SEAL)

Laureat E. Roy — Ida A. Pontbriand (SEAL)

State of Maine, Androscoggin } ss. March 31, 1952, 1952.

Personally appeared the above named Arthur J. Pontbriand and acknowledged the foregoing instrument to be his free act and deed.

Before me, Laureat E. Roy, Notary Public (SEAL)

Received April 1, 1952 *at* 9 *o'clock* - *M.* A. *M. and recorded from the original.*

MAINE SHORT FORM WARRANTY DEED

We, BERTRAND L. PONTBRIAND, GERALD R. PONTBRIAND, FERNAND L. PONTBRIAND, being umarried, and LEO P. PONTBRIAND, all of Auburn, County of Androscoggin, State of Maine, and MURIEL BARTASIUS, of Poland, said County and State, for consideration paid, grant to THE INHABITANTS OF THE CITY OF AUBURN, a Municipal Corporation located in the County of Androscoggin and State of Maine, with WARRANTY COVENANTS the land situated in said Auburn, bounded and described as follows:

> Beginning at a point on the easterly line of South Main Street at the southwesterly corner of land conveyed by Arthur J. and Ida A. Pontbriand to this grantee by deed dated 1952 and acknowledged on March 31, 1952, recorded in the Androscoggin County Registry of Deeds in Book 669, Page 170; thence the line runs in an easterly direction perpendicular to South Main Street along the southerly line of this grantee a distance of one hundred fifty (150) feet to the southeasterly corner of the land of this grantee; thence the line runs in a southerly direction parallel with South Main Street a distance of ninety-eight (98) feet to a point; thence the line runs in a westerly direction parallel with said southerly line of this grantee a distance of one hundred fifty (150) feet to a point in said line of South Main Street; thence the line runs in a northerly direction along said line of South Main Street ninety-eight (98) feet to the point of beginning.
>
> For the source of title of said Pontbriands, see deed from Katherine M. Small dated June 23, 1944, recorded in said Registry of Deeds in Book 550, Page 93. See also probate records of the estates of said Arthur J. and Ida A. Pontbriand duly recorded in the Androscoggin County Registry of Probate.

ALSO hereby conveying all rights, easements, privileges, and appurtenances belonging to the premises hereinabove described.

CARMEN PONTBRIAND, wife of the said BERTRAND L. PONTBRIAND, THELMA R. PONTBRIAND, wife of the said GERALD R. PONTBRIAND, EDWINA D. PONTBRIAND, wife of the said LEO P. PONTBRIAND, and FRANCIS BARTASIUS, husband of the said MURIEL BARTASIUS, join as grantors and release all rights by descent and all other rights.

WITNESS our hands and seals this day of July, 1971.

_____ Bertrand L. Pontbriand

_____ Gerald R. Pontbriand

_____ Fernand L. Pontbriand

J.P. Leo Pontbriand

M.B. Muriel Bartasavic

C.P. Carmen St. Pontbriand

J.R.P. Helena Pontbriand

C.S.P. Edwina D. Pontbriand

F.B. Francis Bartasavic

STATE OF MAINE
ANDROSCOGGIN, SS.

July 7, 1971

Then personally appeared the above named BERTRAND L. PONTBRIAND and acknowledged the foregoing instrument to be his free act and deed,

Before me,

June Thompson
Notary Public--~~Justice of the Peace~~

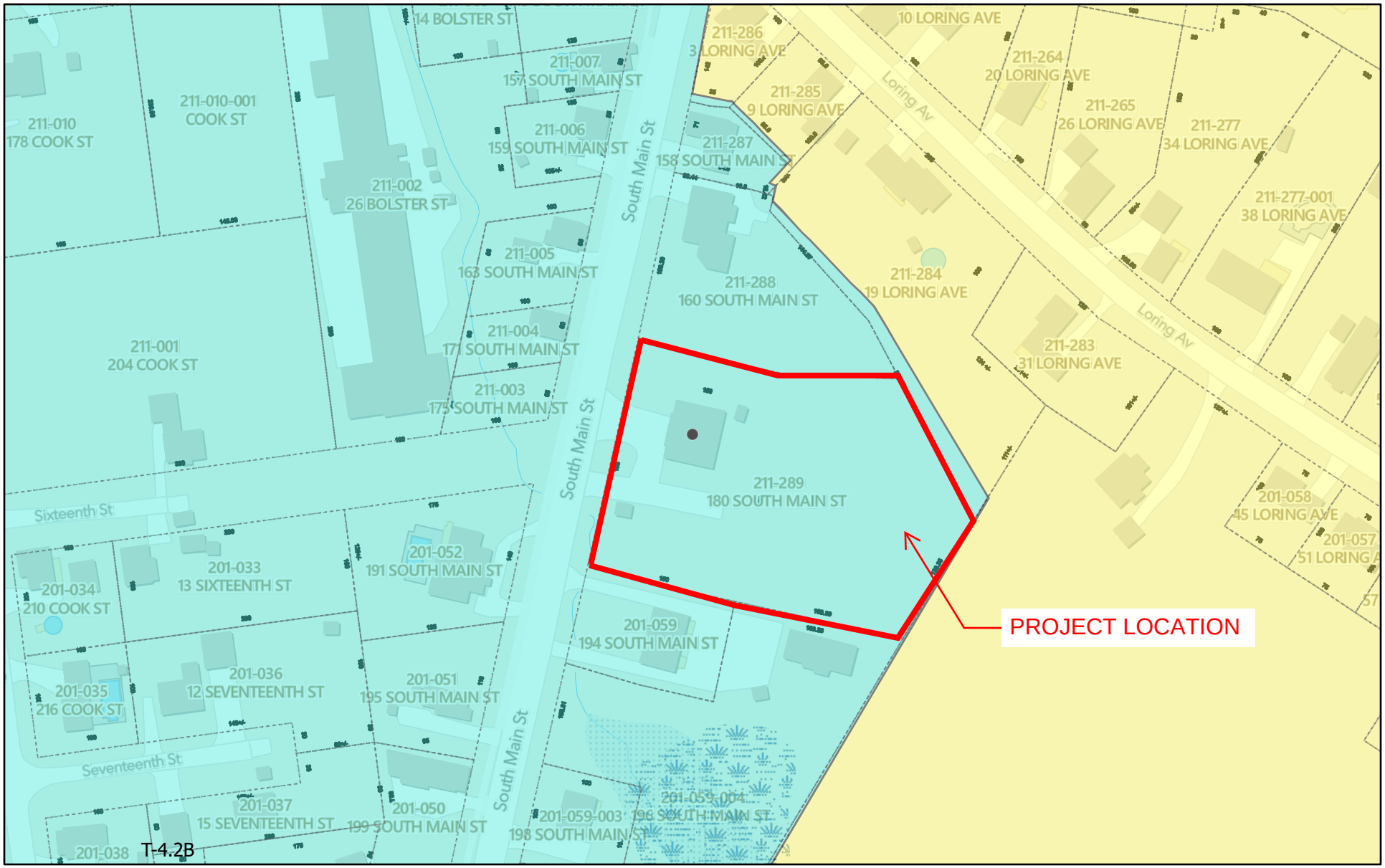
ANDROSCOGGIN, SS.
RECEIVED DEC 13 1971 H. 5 M. P. M.
and recorded from the original

ATTACHMENT 04: PERMIT DRAWINGS

(BOUND SEPARATELY)

ATTACHMENT 05: GIS PARCEL MAP

ArcGIS Web Map



12/3/2024, 4:53:10 PM

1:2,257

0 0.01 0.03 0.05 mi

0 0.02 0.04 0.08 km

Current Parcels _ Public

Auburn Zoning

T-4.2B - Traditional Neighborhood Development District

UR - Urban Residential

Wetlands

ATTACHMENT 06: LIST OF ABUTTING PROPERTIES

Woodard & Curran

Auburn Engine 2 - List of Abutters within 500'

Parcel ID	Owner	Mailing Address
211-288	Diane LaBonte	160 S Main St, Auburn, ME 04210
201-059	JFM No 3 Corp.	800 Center St, Auburn, ME, 04210
201-059-004	JFM No 3 Corp.	800 Center St, Auburn, ME, 04210
211-284	Gabriel Fecteau	314 Fletcher Rd, Auburn, ME 04210
211-282	Matthew M. Fournier	68 Whipple St, Lewiston, ME 04240
201-052	Richard F. Doyon	191 South Main St, Auburn, ME 04210
211-003	City of Auburn	60 Court St, Auburn, ME 04210
211-004	Maurice B. McKenna	171 South Main St, Auburn, ME 04210

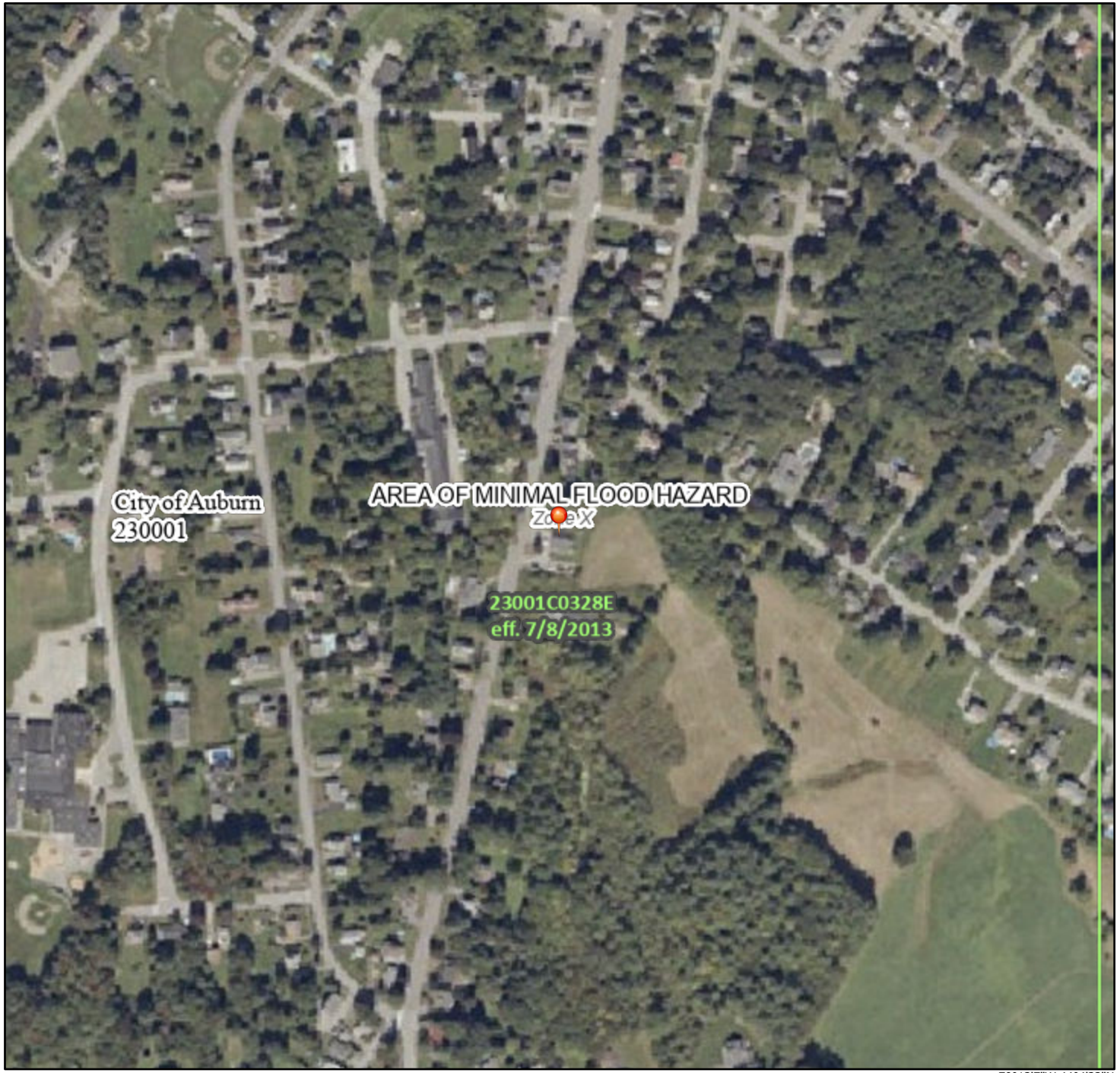
Contact: Robert Angelo, PE | Project Engineer | rangelo@woodardcurran.com | (978) 482-7804

ATTACHMENT 07: FEMA FIRMETTE

National Flood Hazard Layer FIRMette

FEMA

70°13'44"W 44°4'58"N



70°13'7"W 44°4'33"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Basemap Imagery Source: USGS National Map 2023

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
- 513 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 11/11/2024 at 3:35 PM 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.

ATTACHMENT 08: STORMWATER MANAGEMENT REPORT

CITY OF AUBURN, MAINE

ENGINE 2

DESIGN DEVELOPMENT STORMWATER MANAGEMENT REPORT

Prepared for:
City of Auburn
60 Court Street
Auburn, Maine 04210

Prepared By:
12 Mountfort Street
Portland, ME 04101
800.426.4262

0233981.13
December 2024

woodardcurran.com

TABLE OF CONTENTS

SECTION **PAGE NO.**

APPENDICES

1. STORMWATER MANAGEMENT PLAN

This Stormwater Management Plan (SWMP) describes existing site conditions, the proposed redevelopment, erosion and sediment control measures, inspection and maintenance requirements for the proposed stormwater system, and compliance with applicable stormwater standards for the proposed Engine #2 Public Safety Building located at 180 South Main Street, Auburn, Maine.

1.1 Existing Conditions

The existing Engine #2 facility is a one-story building featuring paved parking and a storage shed containing sand to the south. This property, referred to as the "Site" in both its current and redeveloped conditions, is situated between two residential properties to the north and south. To the east, the Site is bordered by a grass meadow, brushed, and wooded areas, as illustrated in **Figure 1** below.

FIGURE 1: AERIAL IMAGERY FROM APRIL 2023 OF THE SITE, OBTAINED FROM GOOGLE EARTH PRO.

The existing Site consists of several different land cover conditions including pavement, roof, grass, meadow, brush, and wooded area. The Site's topography slopes generally from west to east with the developed portion set at a slightly higher elevation. The existing watershed areas for the Site, which also collect run-on from the abutting properties to the north and east, are generally split by a ridge at the fire apparatus bay driveway. Areas contributing run-on and runoff north of the ridge line are regarded as Existing Watershed Area 1 (EWA-1); Areas contributing stormwater run-on and runoff to the south of the ridge line are regarded as Existing Watershed Area 2 (EWA-2) The existing Site drainage infrastructure consists of a catch basin at the northwest of parcel behind the S Main St curb (Design Point 1, DP-1) and a

drainage ditch (Design Point 2, DP-2) with a culvert serving as the outlet control structure at the southwest of the parcel, both ultimately discharging to the same location west of S Main St.

EWA-1 totals 1.60 acres with multiple surface cover types including such as roofs, impervious pavements, wooded areas, grass, meadows, and brush. The Time of Concentration (Tc) path for EWA-1, resulting in a Tc of 16 minutes, is based on runoff from residential parcels along Loring Avenue which sheet and shallow concentrated flows through wooded areas, meadow, brush, and grass areas that slope gradually from the northeast to the southwest before discharging to DP-1. Once collected at DP-1 the stormwater flows are conveyed through the municipal system along S Main Street before discharging to an outfall west of S Main St across from DP-2.

EWA-2 totals 2.67 acres with multiple surface cover types including roofs, impervious surfaces, wooded areas, grass, meadows, and brush. The Time of Concentration (Tc) path for EWA-2, resulting in a Tc of 19.5 minutes, is also based on runoff from residential parcels at Loring Avenue sheet flow and shallow concentrated flow from Loring Avenue through wooded areas, meadow, brush, and grass areas that slope gradually from the northeast to the southwest before discharging to DP-2. Flows through the culvert at DP-2 are then conveyed and discharged to an outfall west of S Main St.

The existing drainage areas, land cover types, and Time of Concentration paths are shown in more detail on the Existing Watershed Area Plan included in **Appendix A**.

The United States Department of Agriculture (USDA) Natural Resource Conservation Service's (NRCS) Web Soil Survey classifies the existing subsurface soils for EWA-1 and EWA-2 into three main soils. Hartland very fine sandy loam (with a Hydrologic Soils Group B), Lyman-Tunbridge complex (with a Hydrologic Soils Group D), and Scantic silt loam (with a Hydrologic Soils Group D). We understand that the existing in-situ soil includes several different types of stratified soil types, ranging from organic silts to clay, based on geotechnical exploration and assessment performed by SW Cole in 2024. Geotechnical information is provided in **Appendix B**.

1.2 Proposed Development

The proposed redevelopment of the existing Auburn Engine #2 Site includes the construction of a new approximately 8,300-square-foot fire station directly east of the existing building, along with the redevelopment of the surrounding Site. The existing facility will remain in use for the majority of the construction period. Additional Site improvements include a paved wrap-around fire apparatus drive aisle on the north side of the building, designed to allow fire apparatus to enter through the rear entrance and exit at the front, removing the need for turning around to park after emergency calls. The proposed design also includes seven parking spaces on the north side of the building, along with a paved walkway around the building. Additionally, a second entrance is planned for a small parking lot to the right of the emergency vehicle entrance for visitor parking. The new building will have two different roof. The northern most roof above the apparatus bay will be flat and will have a roof drain system that discharges to the site's stormwater system. The southernmost roof above the dormitory area will be sloped without dedicated roof drainage.

Proposed stormwater improvements include the addition of catch basin inlets, drainage manholes, a subsurface detention system with an outlet control structure, and associated storm drain piping. ADS Stormtech SC-800 chambers are proposed for subsurface detention.

The proposed Site will manage stormwater runoff from portions of EWA-1 and EWA-2. Under the redeveloped conditions, these areas conveyed to DP-1 are now referred to as Proposed Watershed Area #1A (PWA-1A) and Proposed Watershed Area #1B (PWA-1B). The stormwater conveyed to DP-2 is now referred to as Proposed Watershed Area #2 (PWA-2).

PWA-1A includes most of the EWA-1 area for flows that will bypass the Site's redevelopment and some periphery portions of the redeveloped area. PWA-1A totals 1.50 acres and consists of multiple surface cover types including roofs, impervious area, wooded areas, grass, meadow, brush, and gravel. The Tc for PWA-1A remains 16.0 minutes, as this remains relatively unchanged to the existing condition.

PWA-1B totals 0.50 acres including 0.10 acres of redeveloped area from EWA-1 and 0.40 acres of redeveloped area from EWA-2. The subcatchment features multiple surface cover types including impervious area, roofs, and grass. Runoff in this subcatchment is collected by deep sump hooded catch basins, conveyed through a closed drainage system, attenuated by the subsurface detention system, and then discharged through the outlet control structure to DP-1. The subsurface detention system's outlet control structure has been designed with a narrow-slotted weir to attenuate flows from the redeveloped area. PWA-1B consists predominantly of impervious areas; therefore the minimum Tc of 6 minutes was assumed

PWA-2 includes most of the EWA-2 flows that will bypass the Site's redevelopment and the southern side of the redevelopment, totaling 2.28 acres. The subcatchment features multiple surface cover types including impervious areas, roofs, wooded areas, grass, meadow, brush, and gravel. Runoff is conveyed via overland flow to the existing drainage ditch and culvert on Site (DP-2). Through the grading adjustments made for the redevelopment of the Site, the new Tc for the sheet flow and shallow concentration flow increases to 20.7 minutes.

The proposed drainage areas, land cover types, and Time of Concentration paths are shown in more detail on the Proposed Watershed Area Plan included in **Appendix A**.

1.3 Inspection & Maintenance Requirements

General inspection and maintenance of stormwater systems will take place during and after construction. During construction, the Contractor will be responsible for inspecting and maintaining the Site, as described in **Section 1.4.1** of this Report. Upon completion of construction, the property owner will be responsible for implementing the Operations and Maintenance Plan for the proposed stormwater system, which is provided in **Appendix C** of this Report.

1.4 Stormwater Standards and Applicable Criteria

The project is required to manage stormwater on the Site in accordance with applicable Maine Department of Environmental Protection (DEP) and City of Auburn regulations. The project will disturb approximately 1.35 acres and result in approximately 0.65 acres of impervious area, inclusive of a net increase of approximately 0.43 acres of impervious area. Therefore, the project will requires compliance with Basic Standards (erosion and sedimentation control) of DEP's Chapter 500 Stormwater Regulations. Anticipated non-stormwater discharges may be on Site including discharges from firefighting activity, vehicle wash water if detergents are not used, dust control runoff, and uncontaminated groundwater dewatering.

The project does not exceed DEP or City of Auburn thresholds for the general standard (stormwater quality treatment) or the flooding standard (stormwater quantity) of DEP Chapter 500 stormwater regulations. The

project is not located within the direct watersheds of Lake Auburn or Taylor Pond; therefore, compliance with the City's phosphorous control standard is not required. The proposed stormwater conveyance system will be sized to convey the 25-year storm and the proposed site has been designed to mitigate peak discharge flow rates for the 25-year storm event to prevent adverse impacts to the downstream stormwater infrastructure in compliance with City of Auburn Code of Ordinances Sec. 46-210(a)(3).

1.4.1 Basic Standard (Soil Erosion & Sediment Control)

A variety of erosion and sediment control measures will be utilized during construction, including but not limited to the following:

- Stabilized construction entrances;
- Up-gradient runoff diversion barriers;
- Downgradient sediment barriers;
- Catch basin inlet protection devices;
- Preservation and maintenance of vegetated areas to the maximum extent possible;
- Temporary stabilization of disturbed areas to be exposed for more than seven days;
- Permanent stabilization of final graded areas;
- Controls for fugitive dust, debris, and other materials; and
- Inspection of all measures until the Site is permanently stabilized.

Structural measures will be installed as shown on the design drawings. Details and specifications for these measures are included on the drawings. All measures will be implemented in accordance with the "Maine Erosion and Sedimentation Handbook for Construction: Best Management Practices". All temporary measures will be installed prior to any earth-disturbing activities and will be removed upon permanent stabilization of the Site. The Contractor will be responsible for implementing and maintaining all erosion and sediment control measures in an effective operating condition during construction. Permanent erosion control measures will include vegetation and pavement. After construction, the Owner will be responsible for inspecting and maintaining the Site as described in **Section 1.3** of this Report.

1.4.2 General Standard (Stormwater Quality)

The project does not exceed DEP or City of Auburn thresholds for the general standard (stormwater quality treatment) of DEP Chapter 500 stormwater regulations. The project is not located within the direct watersheds of Lake Auburn or Taylor Pond; therefore, compliance with the City's phosphorous control standard is not required.

Although not required by local or State stormwater regulations, some water quality treatment measures will be provided, such as deep sump catch basins and pretreatment within the subsurface detention system, are proposed as part of the project to help improve the quality of stormwater runoff in accordance with stormwater management best practices.

1.4.3 Flooding Standard (Stormwater Quantity)

The project does not exceed DEP or City of Auburn thresholds for the general standard or the flooding standard (stormwater quantity) of DEP Chapter 500 stormwater regulations.

The proposed stormwater conveyance system will be sized to convey the 25-year storm and the proposed site has been designed to mitigate peak discharge flow rates for the 25-year storm event to prevent adverse impacts to the downstream stormwater infrastructure in compliance with City of Auburn Code of Ordinances Sec. 46-210(a)(3).

Stormwater models were prepared for the pre-development and post-development Site conditions. Adequate provisions have been made to collect and control stormwater via the subsurface detention system. The following sections describe the stormwater modeling methodology and the results of the HydroCAD analysis.

1.4.2.1 Stormwater Modeling Methodology

Stormwater modeling was completed using the HydroCAD 10.20-5c Stormwater Modeling System by HydroCAD Software Solutions, LLC., which uses TR-20 runoff calculation methodology. The HydroCAD output for both the pre- and post-development models are provided in **Appendix C**. A 24-hour duration and Type III rainfall distribution was applied to the rainfall depths for the 2-year, 5-year, 10-year, and 25-year storm events from Appendix H of the DEPs Chapter 500 Rules.

HydroCAD provides a lookup table for curve number (CN), which is a measure of the retention and runoff properties of various surfaces based on the Hydrological Soil Group (HSG) and land cover type using TR-55 methodology. The Site contains subsurface soils within Hydrologic Soil Group B and D. We understand that the existing in-situ soil for five test borings (B-201 through B-205) include several different types of stratified soil types, ranging from organic silts to clay, based on geotechnical exploration and assessment performed by SW Cole in 2024. Conservatively, we have assumed poor infiltration due to the clay layers in the areas with a corresponding Hydrologic Soils Group of D. The area of each land cover type was delineated utilizing topographical survey information and HydroCAD computed the final CN for each subcatchment based on an area-weighted average.

The Time of Concentration is the time required for runoff to travel from the most hydrologically distant point of a watershed to the point of discharge. The longest hydraulic flow path is partitioned into segments based on flow types, land cover, and slopes. The Tc for each watershed is computed within HydroCAD as the sum of the travel times for each consecutive flow segment along the longest hydraulic flow path. The primary types of flow consist of sheet flow, shallow concentrated flow, and channel flows; sheet flow typically occurs within the first 100-feet of runoff. A minimum Tc of six minutes is typically utilized for urban developed areas that are predominantly impervious.

As previously described, the project area ultimately discharges runoff in two locations; these two discharge points have been utilized as the Design Points for the stormwater analysis:

- Design Point #1: the existing catch basin located on northwest of the Site.
- Design Point #2: the existing ditch at the southwest of the Site.

Existing and proposed drainage patterns and features are shown in the drawings provided in **Appendix A**.

1.4.2.2 Pre- and Post-Development Peak Runoff Rate Results

The table below provides a summary of the peak runoff rates for the 24-hour, 2-, 5-, 10-, and 25-year Type III storm events:

Design Point		Peak Runoff Rate (cfs)			
		2-Year Storm	5-Year Storm	10-Year Storm	25-Year Storm
#1	Pre-Development	1.08	1.74	2.35	3.56
	Post-Development	1.03	1.65	2.24	3.51
	Net Change	-0.05	-0.09	-0.11	-0.05
#2	Pre-Development	1.66	2.67	3.62	5.47
	Post-Development	1.60	2.49	3.31	4.90
	Net Change	-0.06	-0.18	-0.31	-0.57

The proposed stormwater management system has been designed to maintain current runoff conditions to the maximum extent possible. The table above demonstrates an overall reduction in the net peak runoff rates from the Site during the 2-, 5-, 10- and 25-year storm events.

APPENDIX A: WATERSHED AREA PLANS.

NOTES:

1. EXISTING CONDITIONS INFORMATION IS BASED ON EXISTING CONDITIONS LAND SURVEY PERFORMED BY MAIN-LAND DEVELOPMENT CONSULTANTS, INC. PERFORMED IN DECEMBER 2023 AND SUPPLEMENTED WITH ONSITE OBSERVATIONS PERFORMED BY WOODARD AND CURRAN IN 2024, RECORD DRAWINGS, AND LIDAR TOPOGRAPHY.
2. HYDROLOGIC SOILS GROUP (HSG) BOUNDARIES ARE BASED DATA PROVIDED BY THE UNITED STATES DEPARTMENT OF AGRICULTURE'S NATURAL RESOURCES CONSERVATION SERVICES WEB SOIL SURVEY.

LEGEND

- IMPERVIOUS AREA, HSG B
- ROOF AREA, HSG B
- GRASS AREA, HSG B
- BRUSH AREA, HSG B
- MEADOW AREA, HSG B
- WOODED AREA, HSG B
- IMPERVIOUS AREA, HSG D
- ROOF AREA, HSG D
- GRASS AREA, HSG D
- BRUSH AREA, HSG D
- MEADOW AREA, HSG D
- WOODED AREA, HSG D
- EWA — SUBCATCHMENT AREAS
- DP — DESIGN POINT
- P — POND/CATCH BASIN
- TIME OF CONCENTRATION (Tc) FLOW LINE
- DRAINAGE AREA BOUNDARY
- HSG BOUNDARY

30' 0 30' 60'

BAR SCALE
1" = 30'
CHECK GRAPHIC SCALE BEFORE USING

THIS PLAN SHOULD BE REVIEWED IN COLOR

Woodard & Curran
12 Mountfort Street
Portland, Maine 04101
800.426.4262 | www.woodardcurran.com

simons architects
designed for human potential

Allied Engineering
Structural Mechanical Electrical Plumbing

context ARCHITECTURE

Thornton Tomasetti

PE SEAL:

NOT FOR CONSTRUCTION

CLIENT INFO:

CITY OF AUBURN
AUBURN, MAINE

AUBURN ENGINE 2

REV	MM/DD/YY	DESCRIPTION

JOB NO:	233981.13
DATE:	DECEMBER 2024
SCALE:	AS NOTED
DESIGNED BY:	CC
DRAWN BY:	CC
CHECKED BY:	RA
FILENAME:	233981.13 EXISTING WATE*.dwg

DRAWING TITLE:
CIVIL
EXISTING WATERSHED PLAN

DRAWING NO:
EWP

NOTES:

1. EXISTING CONDITIONS INFORMATION IS BASED ON EXISTING CONDITIONS LAND SURVEY PERFORMED BY MAIN-LAND DEVELOPMENT CONSULTANTS, INC. PERFORMED IN DECEMBER 2023 AND SUPPLEMENTED WITH ONSITE OBSERVATIONS PERFORMED BY WOODARD AND CURRAN IN 2024, RECORD DRAWINGS, AND LIDAR TOPOGRAPHY.
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- GRASS AREA, HSG B
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- WOODED AREA, HSG B
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- BRUSH AREA, HSG D
- MEADOW AREA, HSG D
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30' 0 30' 60'

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context ARCHITECTURE

Thornton Tomasetti

PE SEAL:

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CLIENT INFO:

CITY OF AUBURN
AUBURN, MAINE

AUBURN ENGINE 2

REV	MM/DD/YY	DESCRIPTION

JOB NO:	233981.13
DATE:	DECEMBER 2024
SCALE:	AS NOTED
DESIGNED BY:	CC
DRAWN BY:	CC
CHECKED BY:	RA
FILENAME:	233981.13 POST-DEV WATE*.dwg

DRAWING TITLE:

CIVIL
POST-DEVELOPMENT WATERSHED PLAN

DRAWING NO:

PWP

APPENDIX B: GEOTECHNICAL INFORMATION

REPORT – rev. 1

21-0920.1 S

September 16, 2024

Explorations and Geotechnical Engineering Services

Proposed Engine 2 Fire Station Replacement
180 South Main Street
Auburn, Maine

Prepared For:
Woodard & Curran, Inc.
Attention: Barry Sheff, P.E.
12 Mountfort Street
Portland, ME 04101

Prepared By:
S. W. Cole Engineering, Inc.
286 Portland Road
Gray, ME 04039
T: 207-657-2866

TABLE OF CONTENTS

21-0920.1 S

September 16, 2024

Woodard & Curran, Inc.
Attention: Barry Sheff, P.E.
12 Mountfort Street
Portland, ME 04101

Subject: Explorations and Geotechnical Engineering Services – Rev. 1
Proposed Engine 2 Fire Station Replacement
180 South Main Street
Auburn, Maine

Dear Barry:

In accordance with our Agreement, dated April 18, 2024, and Contract Addendum, dated August 1, 2024, we have performed subsurface explorations for the subject project. This report summarizes our findings and geotechnical recommendations and its contents are subject to the limitations set forth in Appendix A.

1.0 INTRODUCTION

1.1 Scope and Purpose

The purpose of our services was to obtain subsurface information at the site in order to develop geotechnical recommendations relative to foundations, earthwork, and pavement associated with the proposed construction. Our scope of services included a review of preliminary phase explorations, design phase explorations, soils laboratory testing, a geotechnical analysis of the subsurface findings, and preparation of this report.

1.2 Site and Proposed Construction

The site is located at 180 South Main Street in Auburn, Maine and is comprised of the existing Engine 2 Fire Station and an undeveloped open field and low laying vegetated areas south and east of the existing station. Existing grades generally rise across the

site to the east, ranging from approximately elevation 252 (project datum) in the southwest corner to elevation 269 feet in the southeast corner.

S. W. Cole Engineering, Inc. (S.W.COLE) provided preliminary explorations and geotechnical engineering services for the prior proposed fire station concept in 2023. Since that time, we understand the proposed development has been revised and now includes a new approximate 8,300 SF fire station with associated paved and landscape areas. We understand the building will be on-grade and single-story except for a partial mezzanine level. High apparatus bays are proposed on the northerly side of the building. We understand a finish floor elevation of 260 feet is proposed, requiring tapered grade-raise fills approaching 3 feet.

Paved access drives and parking areas will be provided on the north, east, and west sides of the proposed building. A retaining wall up to about 3 feet tall is proposed on the edge of the proposed paved area in the northeast corner of the site.

2.0 EXPLORATION AND TESTING

2.1 Explorations

2.1.2 Current Explorations

Five design-phase test borings (B-201 through B-205) were made at the site on May 2 and 3, 2024 by Seaboard Drilling, LLC. These exploration locations were requested by Thornton Tomasetti (project structural engineer) and established in the field by S. W. Cole Engineering, Inc. (S.W.COLE) using measurements from existing site features. Additionally, three Cone Penetration Tests (CPT-1 through CPT-3) were made at the site on August 26, 2024 by Seaboard Drilling, LLC. These explorations were established in the field by S.W.COLE using measurements from existing site features. The approximate exploration locations are shown on the “Exploration Location Plan” attached in Appendix B. Logs of these explorations and a key to the notes and symbols used on the logs are attached in Appendix C. The elevations shown on the logs were estimated based on topographic information shown on the “Exploration Location Plan”.

2.1.2 Prior Explorations

Five preliminary-phase test borings (B-101 through B-105) were made at the site on May 16, 2023 by S. W. Cole Explorations, LLC. These exploration locations were

selected and established in the field by S. W. Cole Engineering, Inc. (S.W.COLE) using GPS methods. The approximate exploration locations are shown on the "Exploration Location Plan" attached in Appendix B. Logs of these explorations and a key to the notes and symbols used on the logs are attached in Appendix C.

2.2 Field Testing

The test borings were drilled using a combination of hollow stem auger and cased wash-boring techniques. The soils were sampled at 2 to 5 foot intervals using a split spoon sampler and Standard Penetration Testing (SPT) methods. Pocket Penetrometer Tests (PPT) were performed where stiffer cohesive soils were encountered. Shelby tube sampling and Vane Shear Testing (VST) were attempted where softer cohesive soils were encountered. SPT blow counts, PPT, and VST results are shown on the logs.

The CPT's were made by pushing a Vertek digital cone to collect cone resistance (q_c), sleeve friction (f_s), and pore water pressure (u) data. Additionally, shear wave velocity (V_s) testing was performed at approximate 1-meter intervals during CPT advancement. CPT data and shear wave velocity testing results are noted on the CPT logs.

2.3 Laboratory Testing

The soils encountered in the test borings were visually classified. Soil samples obtained from the explorations were returned to our laboratory for further classification and testing. Moisture content test results are noted on the boring logs.

3.0 SUBSURFACE CONDITIONS

3.1 Soil and Bedrock

The test borings encountered a soils profile generally consisting of uncontrolled fill and buried relic organics, or a relatively thick surficial layer of topsoil and organics, overlying native glaciomarine sand, silt, and clay, overlying glacial till and refusal surfaces (probable boulder or bedrock) with depth. The principal soils encountered at the explorations are summarized below. Not all of the strata were encountered at each exploration; refer to the attached boring logs for more detailed subsurface information.

Uncontrolled Fill and Buried Relic Organics: Borings B-202, B-203, and B-204 and CPT-1 encountered uncontrolled fill extending to depths ranging from about 3.5 to 5 feet below ground surface (bgs). The uncontrolled fill consisted of loose brown and gray-brown sand or silt with varying portions of gravel and organics. Underlying the uncontrolled fill, borings B-203 and B-204 encountered layers of buried relic organics up to about 1-foot thick.

Topsoil and Organics: Outside the areas of encountered uncontrolled fill, the remaining explorations encountered a surficial layer of topsoil, organics, and clayey silt with roots up to about 2 feet thick. We anticipate portions of the site were once cultivated for agricultural purposes and, therefore, thicker layers of topsoil and organics may be present.

Glaciomarine Deposits: Underlying the surficial organics, uncontrolled fill, and buried relic organics, the explorations encountered glaciomarine soil deposits. The glaciomarine deposits generally consisted of an upper "crust" of layered sand, silt and, very stiff to stiff brown to gray-brown silty clay which extended to depths of about 10 to 15 feet below ground surface (bgs). Underlying the upper crust, the glaciomarine deposit transitioned to layers of relatively softer gray silty clay with frequent sand seams and layers which extended to depths varying from about 13 to 30 feet bgs.

Glacial Till: Underlying the glaciomarine deposits, borings B-101, B-102, B-103, B-201, B-202, B-203, and B-205 encountered glacial till consisting of loose to very dense, gray to brown, silty sand or silt and sand with varying portions of gravel and cobbles. Rod probing performed at borings B-104 and B-105 and the CPTs also encountered granular soils underlying the glaciomarine deposits.

Refusal Surface: Underlying the glacial till, borings B-103 and B-204, encountered refusal surfaces (probable boulder or bedrock) at depths ranging from about 19 and 22 feet bgs. The CPTs also encountered refusal surfaces at depths ranging from about 19 to 30 feet bgs.

3.2 Groundwater

The soils encountered at the test borings were moist to wet from the ground surface. Saturated soils were encountered at depths varying from 5 to 16 feet. Standing water was present in the lower laying wet areas of the site during the explorations. Groundwater likely becomes perched on the relatively impervious silty clay and glacial till encountered at

the test borings. Long term groundwater information is not available. It should be anticipated that groundwater levels will fluctuate, particularly in response to periods of snowmelt and precipitation, as well as changes in site use.

4.0 EVALUATION AND RECOMMENDATIONS

4.1 General Findings

Based on the subsurface findings, the proposed construction appears feasible from a geotechnical standpoint. The principle geotechnical considerations include:

- The explorations made in the undeveloped portions of the site encountered relatively thick layers of topsoil and organics. We recommend all existing topsoil and organics be removed from beneath the proposed building, paved areas, and retaining wall. Considering the subsurface findings and probable prior agricultural cultivation at the site, the contractor should anticipate a relatively deep stripping and grubbing depth.

- The explorations made around the existing Engine 2 fire station and developed areas of the site encountered layers of uncontrolled fill and buried relic organics which are unsuitable for support of the proposed building and paved areas. We recommend all existing fill, buried relic organics, pavement, utilities, structures, and foundations be removed from beneath the proposed building, pavement, and retaining walls, and backfilled with compacted Granular Borrow.

- The layers of softer gray silty clay underlying the site are compressible under new loading from grade-raise fills, building foundations, and floor slab loads; however, the layers are relatively thin and appears overconsolidated. We recommend that grade-raise fills beneath the building be placed a minimum of 30 days prior to excavating for foundations to help reduce post-construction settlement.

- Spread footing foundations and slab-on-grade floors bearing on properly prepared subgrades appear suitable for the proposed building. Footings should bear on at least 6-inches of compacted Crushed Stone overlying undisturbed native non-organic soils. On-grade floor slabs in the apparatus bays should bear on at least 6 inches of MaineDOT 703.06 Aggregate Base Type A, overlying at least 12-inches

of compacted Structural Fill, overlying properly prepared subgrades. On-grade floor slabs in less heavily loaded areas should bear on at least 12-inches of compacted Structural Fill overlying properly prepared subgrades.

- Existing uncontrolled fill and buried relic organics should be removed beneath proposed paved areas and backfilled with compacted Granular Borrow.

- Woven geotextile should be provided over pavement subgrades consisting of silty clay, anticipated in proposed cut areas of the site.

- Subgrades across the site will consist of sensitive, wet silts and clays. Earthwork and grading activities should occur during drier, non-freezing weather of Spring, Summer, and Fall. Rubber tired construction equipment should not operate directly on the native clays when wet. Temporary haul roads overlying woven geotextile will likely be needed Excavation of bearing surfaces should be completed with a smooth-edged bucket to lessen subgrade disturbance.

- Imported Crushed Stone, Structural Fill, and Granular Borrow will be needed for construction; Granular Borrow for Underwater Backfill will be needed over wet subgrades. The site soils are unsuitable for reuse in building and paved areas, but may be suitable for reuse as compacted Common Borrow in landscape areas provided they are at a compactable moisture content at the time of reuse.

4.2 Site and Subgrade Preparation

We recommend that site preparation begin with the construction of an erosion control system to protect adjacent drainage ways and areas outside the construction limits. Organics, roots and topsoil should be completely removed from areas of proposed fill and construction. As much vegetation as possible should remain outside the construction areas to lessen the potential for erosion and site disturbance.

Building Pad and Footings: We recommend topsoil, soils with organics, uncontrolled fill, buried relic organics, pavement, utilities, structures, and foundations be removed from beneath the proposed building and retaining walls and backfilled with compacted Granular Borrow. The extent of removal should extend 1 foot laterally outward from outside edge of perimeter footings for every 1-foot of excavation depth (1H:1V bearing splay). The overexcavated area should be backfilled with compacted Granular Borrow.

As discussed, we recommend grade-raise fills beneath the building be placed a minimum of 30 days prior to excavating for foundations to reduce post-construction settlement due to the underlying silty clay.

We recommend that footings be excavated using a smooth-edged bucket and that footings be underlain by at least 6 inches of compacted Crushed Stone. On-grade floor slabs in the apparatus bays should bear on at least 6 inches of MaineDOT 703.06 Aggregate Base Type A, overlying at least 12-inches of compacted Structural Fill, overlying properly prepared subgrades. On-grade floor slabs in less heavily loaded areas should bear on at least 12-inches of compacted Structural Fill overlying properly prepared subgrades.

Paved and Utilities: Uncontrolled fills and buried relic topsoil should be removed beneath proposed paved areas and backfilled with compacted Granular Borrow. A woven geotextile fabric, such as Mirafi 600X, should be installed over pavement subgrades consisting of native silty clay, anticipated in proposed cut areas.

Beneath pipes and utility structures with soft trench bottoms, we recommend overexcavating with a smooth edged bucket and installing at least 1 foot of Underdrain Sand below customary bedding materials wrapped in geotextile fabric. The depth of customary bedding materials for soft trench bottoms should be at least 12 inches for pipes and 24 inches for structures.

We recommend that stormdrains installed beneath paved areas in the rear of the site where cuts are proposed and silty clay subgrades are anticipated, be designed and installed as MaineDOT Type C Underdrains.

4.3 Excavation and Dewatering

Excavation work will generally encounter uncontrolled fills, buried relic organics, relatively thick surficial layers of topsoil and organics, and sensitive wet silty clay soils. Care must be exercised during construction to limit disturbance of the bearing soils. Earthwork and grading activities should occur during drier, non-freezing weather of Spring, Summer and Fall. Rubber tired construction equipment should not operate directly on the native silts and clays, when wet. Low ground pressure tracked equipment may be needed and temporary haul roads overlying geotextile fabric may be necessary. Final cuts to subgrade

should be performed with a smooth-edged bucket to help reduce strength loss from soil disturbance.

Vibrations from construction should be controlled below threshold limits of 0.5 in/sec for structures, water supply wells and infrastructure within 500 feet of the project site. More restrictive vibration limits may be warranted in specific cases with sensitive equipment, historic structures or artifacts on-site or within close proximity.

Sumping and pumping dewatering techniques should be adequate to control groundwater in excavations. Controlling the water levels to at least one foot below planned excavation depths will help stabilize subgrades during construction. Excavations must be properly shored or sloped in accordance with OSHA Regulations to prevent sloughing and caving of the sidewalls during construction. Care must be taken to preclude undermining adjacent structures, utilities and roadways. The design and planning of excavations, excavation support systems, and dewatering is the responsibility of the contractor.

4.4 Foundations

We recommend the proposed buildings be supported on spread footings founded on at least 6-inches of compacted Crushed Stone bearing on undisturbed, non-organic, native silty clay, or compacted Granular Borrow used to backfill overexcavations overlying undisturbed, non-organic, native silty clay. For foundations bearing on properly prepared subgrades, we recommend the following geotechnical parameters for design consideration:

Geotechnical Parameters for Spread Footings and Foundation Walls	
Design Frost Depth (100 year AFI)	4.5 feet
Net Allowable Soil Bearing Pressure	2.0 ksf
Base Friction Factor	0.35
Total Unit Weight of Backfill	125 pcf
At-Rest Lateral Earth Pressure Coefficient	0.5
Internal Friction Angle of Backfill	30°
Seismic Soil Site Class	D (IBC 2015 – Shear Wave Velocity)
Estimated Total Settlement	1-inch
Differential Settlement	½-inch

4.5 Foundation Drainage

We recommend an underdrain system be installed on the outside edge of perimeter footings. The underdrain pipe should consist of 4-inch diameter, perforated SDR-35 foundation drain pipe bedded in Crushed Stone and wrapped in non-woven geotextile fabric. The underdrain pipe must have a positive gravity outlet protected from freezing, clogging and backflow. Surface grades should be sloped away from the building for positive surface water drainage.

4.6 Slab-On-Grade

On-grade floor slabs in heated areas may be designed using a subgrade reaction modulus of 100 pci (pounds per cubic inch). On-grade floor slabs in the apparatus bays should bear on at least 6 inches of compacted MaineDOT 703.06 Aggregate Base Type A, overlying at least 12-inches of compacted Structural Fill, overlying properly prepared subgrades. On-grade floor slabs in less heavily loaded areas should bear on at least 12-inches of compacted Structural Fill overlying properly prepared subgrades.. The structural engineer or concrete consultant must design steel reinforcing and joint spacing appropriate to slab thickness and function, as well as cracking and curling.

We recommend a sub-slab vapor retarder particularly in areas of the building where the concrete slab will be covered with an impermeable surface treatment or floor covering that may be sensitive to moisture vapors. The vapor retarder must have a permeance that is less than the floor cover or surface treatment that is applied to the slab. The vapor retarder must have sufficient durability to withstand direct contact with the sub-slab base material and construction activity. The vapor retarder material should be placed according to the manufacturer's recommended method, including the taping and lapping of all joints and wall connections. The architect and/or flooring consultant should select the vapor retarder products compatible with flooring and adhesive materials.

The floor slab should be appropriately cured using moisture retention methods after casting. Typical floor slab curing methods should be used for at least 7 days. The architect or flooring consultant should assign curing methods consistent with current applicable American Concrete Institute (ACI) procedures with consideration of curing method compatibility to proposed surface treatments, flooring and adhesive materials.

4.7 Entrance Slabs and Sidewalks

Entrance slabs and sidewalks adjacent to the building must be designed to reduce the effects of differential frost action between adjacent pavement, doorways, and entrances. We recommend that non-frost susceptible Structural Fill be provided to a depth of at least 4.5 feet below the top of entrance slabs. This thickness of Structural Fill should extend the full footprint of the entrance slab, thereafter transitioning up to the bottom of the adjacent sidewalk or pavement gravels at a 3H:1V or flatter slope.

4.8 Fill, Backfill and Compaction

We recommend the following fill and backfill materials: recycled products must also be tested in accordance with applicable environmental regulations and approved by a qualified environmental consultant.

Common Borrow: Fill to raise grades in landscape areas should be non-organic compactable earth meeting the requirements of 2020 MaineDOT Standard Specification 703.18 Common Borrow.

Granular Borrow: Fill to raise grades in building and paved areas, as well as to repair soft areas, should be sand or silty sand meeting the requirements of 2020 MaineDOT Standard Specification 703.19 Granular Borrow.

Structural Fill: Backfill for foundations, slab base material and material below exterior entrances slabs should be clean, non-frost susceptible sand and gravel meeting the gradation requirements for Structural Fill as given below:

Structural Fill	
Sieve Size	**Percent Finer by Weight**
4 inch	100
3 inch	90 to 100
¼ inch	25 to 90
No. 40	0 to 30
No. 200	0 to 6

Underdrain Sand: Sand used for bedding materials in soft trench bottoms should be clean, free-draining sand meeting the requirements of 2020 MaineDOT Standard Specification 703.22 Underdrain Backfill Material Type B.

Crushed Stone: Crushed Stone, used beneath foundations, for pipe bedding, and for underdrain aggregate should be washed ¾-inch crushed stone meeting the requirements of 2020 MaineDOT Standard Specification 703.13 Crushed Stone ¾-Inch.

Reuse of Site Soils: The non-organic on-site soils are unsuitable for reuse in building and paved areas, but may be suitable for reuse as Common Borrow in landscape areas, provided they are at a compactable moisture content at the time of reuse.

Placement and Compaction: Fill should be placed in horizontal lifts and compacted such that the desired density is achieved throughout the lift thickness with 3 to 5 passes of the compaction equipment. Loose lift thicknesses for grading, fill and backfill activities should not exceed 12 inches. We recommend that fill and backfill in building and paved areas be compacted to at least 95 percent of its maximum dry density as determined by ASTM D-1557. Crushed Stone should be compacted with 3 to 5 passes of a vibratory plate compactor having a static weight of at least 500 pounds.

4.9 Weather Considerations

Construction activity should be limited during wet and freezing weather and the site soils may require drying or thawing before construction activities may continue. The contractor should anticipate the need for water to temper fills in order to facilitate compaction during dry weather. If construction takes place during cold weather, subgrades, foundations and floor slabs must be protected during freezing conditions. Concrete and fill must not be placed on frozen soil; and once placed, the concrete and soil beneath the structure must be protected from freezing.

4.10 Paved Areas

We anticipate heavy duty paved areas will be subjected emergency vehicle and fire truck traffic and standard duty paved areas will be subjected to passenger vehicles. Considering the site soils, and proposed usage, we offer the following pavement section for consideration:

FLEXIBLE (HMA) PAVEMENT SECTION – 2020 MaineDOT Standard Specs		
Pavement Layer	**Standard Duty**	**Heavy Duty**
MaineDOT 9.5 mm Hot Mix Asphalt	1 ½ inches	1 ½ inches
MaineDOT 19.0 mm Hot Mix Asphalt	2 ½ inches	3 ½ inches
MaineDOT 703.06 Aggregate Base Type A	6 inches	6 inches
MaineDOT 703.06 Aggregate Subbase Type D	12 inches	18 inches
Woven Geotextile (Mirafi 600X) provided over silty clay subgrades		

The base and subbase materials should be compacted to at least 95 percent of their maximum dry density as determined by ASTM D-1557. Hot mix asphalt pavement should be compacted to 92 to 97 percent of its theoretical maximum density as determined by ASTM D-2041. A tack coat should be used between successive lifts of bituminous pavement.

It should be understood that frost penetration can be on the order of 4.5 feet in this area. In the absence of full depth excavation of frost susceptible soils below paved areas and subsequent replacement with non-frost susceptible compacted fill, frost penetration into the subgrade will occur and some heaving and distress of pavement must be anticipated.

We recommend that stormdrains installed beneath paved areas in the rear of the site where cuts are proposed and silty clay subgrades are anticipated, be designed and installed as MaineDOT Type C Underdrains.

4.11 Design Review and Construction Testing

S.W.COLE should be retained to review the construction documents prior to bidding to determine that our earthwork, foundation, and pavement recommendations have been properly interpreted and implemented.

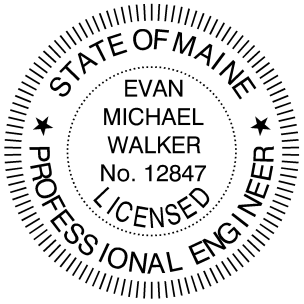
A construction materials testing and quality assurance program should be implemented during construction to observe compliance with the design concepts, plans, and specifications. S.W.COLE is available to observe earthwork activities, the preparation of foundation bearing surfaces and pavement subgrades, as well as to provide testing and IBC Special Inspection services for soils, concrete, steel, spray-applied fireproofing, fire-stopping, structural masonry and asphalt construction materials.

5.0 CLOSURE

It has been a pleasure to be of assistance to you with this phase of your project. We look forward to working with you during the construction phase of the project.

Sincerely,

S. W. Cole Engineering, Inc.



Evan M. Walker, P.E.
Senior Geotechnical Engineer

EMW:tjb

APPENDIX A

Limitations

This report has been prepared for the exclusive use of Woodard & Curran, Inc. for specific application to the proposed Engine 2 Fire Station Replacement at 180 South Main Street in Auburn, Maine. S. W. Cole Engineering, Inc. (S.W.COLE) has endeavored to conduct our services in accordance with generally accepted soil and foundation engineering practices. No warranty, expressed or implied, is made.

The soil profiles described in the report are intended to convey general trends in subsurface conditions. The boundaries between strata are approximate and are based upon interpretation of exploration data and samples.

The analyses performed during this investigation and recommendations presented in this report are based in part upon the data obtained from subsurface explorations made at the site. Variations in subsurface conditions may occur between explorations and may not become evident until construction. If variations in subsurface conditions become evident after submission of this report, it will be necessary to evaluate their nature and to review the recommendations of this report.

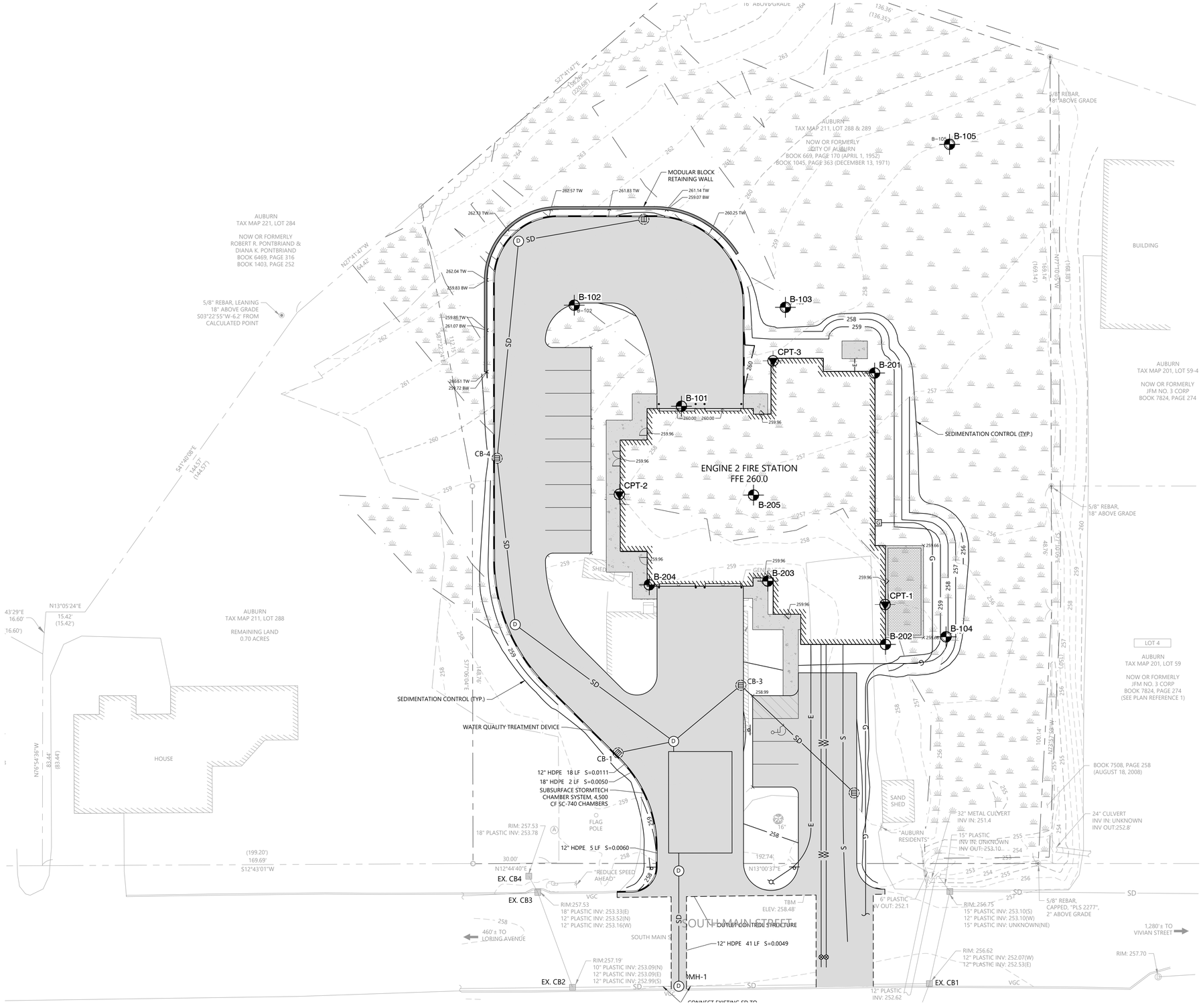
Observations have been made during exploration work to assess site groundwater levels. Fluctuations in water levels will occur due to variations in rainfall, temperature, and other factors.

S.W.COLE's scope of services has not included the investigation, detection, or prevention of any Biological Pollutants at the project site or in any existing or proposed structure at the site. The term "Biological Pollutants" includes, but is not limited to, molds, fungi, spores, bacteria, and viruses, and the byproducts of any such biological organisms.

Recommendations contained in this report are based substantially upon information provided by others regarding the proposed project. In the event that any changes are made in the design, nature, or location of the proposed project, S.W.COLE should review such changes as they relate to analyses associated with this report. Recommendations contained in this report shall not be considered valid unless the changes are reviewed by S.W.COLE.

APPENDIX B

Figures



LEGEND:

- APPROXIMATE BORING LOCATION
- APPROXIMATE CONE PENETRATION TEST LOCATION

NOTES:

1. EXPLORATION LOCATION PLAN WAS PREPARED FROM A 1"=20' SCALE PLAN OF THE SITE ENTITLED "CIVIL GRADING AND DRAINAGE PLAN," PREPARED BY WOODARD & CURRAN, DATED APRIL 20204, RECEIVED VIA E-MAIL 6/3/2024.
2. BORINGS B-101 THROUGH B-105 WERE LOCATED IN THE FIELD BY S. W. COLE ENGINEERING, INC. USING A MAPPING GRADE GPS RECEIVER.
3. BORINGS B-201 THROUGH B-205 WERE LOCATED BY MEASUREMENTS FROM EXISTING SITE FEATURES.
4. CONE PENETRATION TESTS CPT-1 THROUGH CPT-3 WERE LOCATED IN THE FIELD BY MEASUREMENTS FROM BESTING SITE FEATURES.
5. THIS PLAN SHOULD BE USED IN CONJUNCTION WITH THE ASSOCIATED S. W. COLE ENGINEERING, INC. GEOTECHNICAL REPORT.
6. THE PURPOSE OF THIS PLAN IS ONLY TO DEPICT THE LOCATION OF THE EXPLORATIONS IN RELATION TO THE EXISTING CONDITIONS AND PROPOSED CONSTRUCTION AND IS NOT TO BE USED FOR CONSTRUCTION.

NO.	DATE	DESCRIPTION	BY
2	09/12/2024	ADD CPT-1 THROUGH CPT-3	CEM
1	06/06/2024	FINAL REPORT SUBMISSION	CEM
0	05/24/2023	PRELIMINARY REPORT SUBMISSION	CEM

S.W.COLE ENGINEERING, INC.

WOODARD & CURRAN, INC.

EXPLORATION LOCATION PLAN

PROPOSED ENGINE 2 FIRE STATION REPLACEMENT
180 SOUTH MAIN STREET
AUBURN, MAINE

Job No.: 21-0920 Scale: 1" = 20'
Date : 05/24/2023 Sheet: 1

APPENDIX C

Exploration Logs and Key

BORING LOG

BORING NO.: B-201
SHEET: 1 of 1
PROJECT NO. 21-0920.1
DATE START: 5/3/2024
DATE FINISH: 5/3/2024

CLIENT: Woodard & Curran, Inc.
PROJECT: Proposed Engine 2 Fire Station Replacement
LOCATION: 180 South Main Street, Auburn, ME

Drilling Information

LOCATION: See Exploration Location Plan **ELEVATION (FT):** 257.5' +/- **TOTAL DEPTH (FT):** 32.0 **LOGGED BY:** Evan Walker
DRILLING CO.: Seaboard Drilling **DRILLER:** Kevin Hanscom **DRILLING METHOD:** Cased Boring
RIG TYPE: Track Mounted Diedrich D-50 **AUGER ID/OD:** N/A / N/A **SAMPLER:** Standard Split-Spoon
HAMMER TYPE: Automatic / Automatic **HAMMER WEIGHT (lbs):** 140 / 140 **CASING ID/OD:** 4 in / 4 1/2 in **CORE BARREL:** N/A
HAMMER CORRECTION FACTOR: **HAMMER DROP (inch):** 30 / 30
WATER LEVEL DEPTHS (ft): ▽ 7 ft Soils Saturated at Surface and Below 7' +/-
GENERAL NOTES:

KEY TO NOTES AND SYMBOLS:
Water Level: ▽ At time of Drilling; ▼ At Completion of Drilling; ▼ After Drilling
D = Split Spoon Sample; U = Thin Walled Tube Sample; R = Rock Core Sample; V = Field Vane Shear
Pen. = Penetration Length; Rec. = Recovery Length; bpf = Blows per Foot; mpf = Minute per Foot
WOR = Weight of Rods; WOH = Weight of Hammer; RQD = Rock Quality Designation; PID = Photoionization Detector
S_v = Field Vane Shear Strength, kips/sq.ft.; q_U = Unconfined Compressive Strength, kips/sq.ft.; Ø = Friction Angle (Estimated); N/A = Not Applicable

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	SAMPLE INFORMATION: Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_2O Depth	Remarks
			1D		0-2	24/24	1-1-3-4			0.5 Vegetation / Topsoil		
255			2D		2-4	24/22	3-5-6-7	q_P=6-7 ksf		Very stiff to stiff, brown, silty CLAY, with frequent sand seams		
	5		3D		5-7	24/22	3-3-4-3	q_P=3.5-5 ksf				
250			4D		7-9	24/24	5-5-4-4	q_P=2-4 ksf			▽	
										8.0 Stiff, gray-brown, silty CLAY		
										9.0 Medium, gray, silty CLAY		
	10		5D		10-12	24/20	WOH/12"-1-2			11.0 Layered, brown and and gray-brown, medium silty CLAY, and loose silty SAND		
245												
	15		6D		15-17	24/22	WOH/18"-1			15.0 Medium, gray, silty CLAY, with frequent sand seams		
240												
	20		7D		20-22	24/16	5-3-1-4			19.1 Loose to medium dense, gray, silty SAND, trace gravel		
235												
	25		8D		25-27	24/15	10-7-12-15					
230												
	30		9D		30-31.5	18/16	48-46-65			30.0 Very dense, gray, SILT AND SAND, some gravel (Till)		

Bottom of Exploration at 32.0 feet

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

BORING LOG

CLIENT: Woodard & Curran, Inc.
PROJECT: Proposed Engine 2 Fire Station Replacement
LOCATION: 180 South Main Street, Auburn, ME

BORING NO.: B-202
SHEET: 1 of 1
PROJECT NO. 21-0920.1
DATE START: 5/2/2024
DATE FINISH: 5/2/2024

Drilling Information

LOCATION: See Exploration Location Plan | **ELEVATION (FT):** 258' +/- | **TOTAL DEPTH (FT):** 32.0 | **LOGGED BY:** Evan Walker
DRILLING CO.: Seaboard Drilling | **DRILLER:** Kevin Hanscom | **DRILLING METHOD:** Cased Boring
RIG TYPE: Track Mounted Diedrich D-50 | **AUGER ID/OD:** N/A / N/A | **SAMPLER:** Standard Split-Spoon
HAMMER TYPE: Automatic / Automatic | **HAMMER WEIGHT (lbs):** 140 / 140 | **CASING ID/OD:** 4 in / 4 1/2 in | **CORE BARREL:** N/A
HAMMER CORRECTION FACTOR: | **HAMMER DROP (inch):** 30 / 30
WATER LEVEL DEPTHS (ft): ▽ 7 ft Soils Wet to Saturated Below 7' +/-
GENERAL NOTES:

KEY TO NOTES AND SYMBOLS:
Water Level: ▽ At time of Drilling; ▼ At Completion of Drilling; ▼ After Drilling
D = Split Spoon Sample; U = Thin Walled Tube Sample; R = Rock Core Sample; V = Field Vane Shear
Pen. = Penetration Length; Rec. = Recovery Length; bpf = Blows per Foot; mpf = Minute per Foot
WOR = Weight of Rods; WOH = Weight of Hammer; RQD = Rock Quality Designation; PID = Photoionization Detector
S_v = Field Vane Shear Strength, kips/sq.ft.; q_U = Unconfined Compressive Strength, kips/sq.ft.; Ø = Friction Angle (Estimated); N/A = Not Applicable

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_20 Depth	Remarks
			1D		0-2	24/5	4-4-3-3			Loose, gray-brown, SAND, some gravel, some silt, trace organics (FILL)		
255			2D		2-4	24/1	3-3-2-4					
	5		3D		5-7	24/24	4-4-5-6	q_P=6-9 ksf		5.0 Very stiff, gray-brown, silty CLAY, with frequent sand seams and layers	▽	
250			4D		7-9	24/24	4-5-5-4	q_P=5-6 ksf				
	10		5D		10-12	24/20	3-3-4-3	q_P=1-3 ksf		9.0 Stiff, brown, silty CLAY, with frequent sand seams		
			6D		12-14	24/18		q_P=1 ksf		11.5 Stiff, gray, silty CLAY, with frequent sand seams		
245												
	15		7D		15-17	24/18	1-1-2-1			15.0 Layered, gray, medium silty CLAY and loose silty fine SAND		
240										17.0 Medium, gray, silty CLAY, with occasional sand seams		
	20		8D		20-22	24/24	WOH/18"-1					
235												
	25		1U		25-26.6	19/19				25.0 Loose, gray, SILT AND SAND, trace gravel		
			9D		26.6-28.6	24/16	4-5-6-6			27.0 Medium dense, gray, SILT AND SAND, trace gravel (Till)		
230												
	30		10D		30-32	24/18	8-13-18-22			30.0 Dense, gray, silty SAND, some gravel (Till)		

Bottom of Exploration at 32.0 feet

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

BORING LOG

CLIENT: Woodard & Curran, Inc.
PROJECT: Proposed Engine 2 Fire Station Replacement
LOCATION: 180 South Main Street, Auburn, ME

BORING NO.: B-203
SHEET: 1 of 1
PROJECT NO. 21-0920.1
DATE START: 5/2/2024
DATE FINISH: 5/2/2024

Drilling Information

LOCATION: See Exploration Location Plan | **ELEVATION (FT):** 259' +/- | **TOTAL DEPTH (FT):** 32.0 | **LOGGED BY:** Evan Walker
DRILLING CO.: Seaboard Drilling | **DRILLER:** Kevin Hanscom | **DRILLING METHOD:** Cased Boring
RIG TYPE: Track Mounted Diedrich D-50 | **AUGER ID/OD:** N/A / N/A | **SAMPLER:** Standard Split-Spoon
HAMMER TYPE: Automatic / Automatic | **HAMMER WEIGHT (lbs):** 140 / 140 | **CASING ID/OD:** 4 in / 4 1/2 in | **CORE BARREL:** N/A
HAMMER CORRECTION FACTOR: | **HAMMER DROP (inch):** 30 / 30
WATER LEVEL DEPTHS (ft): ▽ 8 ft Soils Wet to Saturated Below 8' +/-
GENERAL NOTES:

KEY TO NOTES AND SYMBOLS:
Water Level: ▽ At time of Drilling; ▼ At Completion of Drilling; ▼ After Drilling
D = Split Spoon Sample; U = Thin Walled Tube Sample; R = Rock Core Sample; V = Field Vane Shear
Pen. = Penetration Length; Rec. = Recovery Length; bpf = Blows per Foot; mpf = Minute per Foot
WOR = Weight of Rods; WOH = Weight of Hammer; RQD = Rock Quality Designation; PID = Photoionization Detector
S_v = Field Vane Shear Strength, kips/sq.ft.; q_U = Unconfined Compressive Strength, kips/sq.ft.; Ø = Friction Angle (Estimated); N/A = Not Applicable

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_20 Depth	Remarks
			1D		0-2	24/16	2-2-2-3			0.5 Vegetation / Topsoil (FILL)		
			2D		2-4	24/18	2-2-3-4			1.6 Loose, dark, gray-brown, silty SAND, some gravel, trace organics (FILL)		
255										Gray-brown and brown, layered, silty CLAY, clayey SILT, and silty SAND, trace organics (FILL)		
	5		3D		5-7	24/24	3-3-5-5	q_P=7 ksf		5.2 Loose, gray, clayey SILT, with rootlets		
			4D		7-9	24/24	6-7-8-9	q_P=5-5.5 ksf		6.0 Gray-brown and brown, layered, very stiff silty CLAY, clayey SILT, and silty fine SAND	▽	
250												
	10		5D		10-12	24/24	5-7-9-6	q_P=7 ksf		10.0 Very stiff, brown, silty CLAY, with frequent sand seams		
			6D		12-14	24/18	5-4-3-2	q_P=0.5 ksf		12.0 Stiff, gray-brown, silty CLAY		
245										13.5 Medium, gray, silty CLAY, with frequent sand seams and layers		
	15		7D		15-17	24/24	WOH/18"-4					
240												
	20		8D		20-22	24/24	WOH/24"	w =37.8 %				
235												
	25		1U		25-27	24/18				25.0 Loose, gray, SILT AND SAND, trace gravel		
			1V		27-27	0						
230										29.0 Very dense, gray, silty SAND, some gravel (Till)		
	30		9D		30-32	24/18	15-33-38-46					

Bottom of Exploration at 32.0 feet

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

BORING LOG

BORING NO.:	**B-204**
SHEET:	1 of 1
PROJECT NO.	21-0920.1
DATE START:	5/2/2024
DATE FINISH:	5/2/2024

CLIENT: Woodard & Curran, Inc.
PROJECT: Proposed Engine 2 Fire Station Replacement
LOCATION: 180 South Main Street, Auburn, ME

Drilling Information

LOCATION: See Exploration Location Plan **ELEVATION (FT):** 259' +/- **TOTAL DEPTH (FT):** 22.3 **LOGGED BY:** Evan Walker
DRILLING CO.: Seaboard Drilling **DRILLER:** Kevin Hanscom **DRILLING METHOD:** Cased Boring
RIG TYPE: Track Mounted Diedrich D-50 **AUGER ID/OD:** N/A / N/A **SAMPLER:** Standard Split-Spoon
HAMMER TYPE: Automatic / Automatic **HAMMER WEIGHT (lbs):** 140 / 140 **CASING ID/OD:** 4 in / 4 1/2 in **CORE BARREL:** N/A
HAMMER CORRECTION FACTOR: **HAMMER DROP (inch):** 30 / 30
WATER LEVEL DEPTHS (ft): ▽ 7 ft Soils Wet to Saturated Below 7' +/-
GENERAL NOTES:

KEY TO NOTES AND SYMBOLS:
Water Level: ▽ At time of Drilling; ▼ At Completion of Drilling; ▼ After Drilling
D = Split Spoon Sample; U = Thin Walled Tube Sample; R = Rock Core Sample; V = Field Vane Shear
Pen. = Penetration Length; Rec. = Recovery Length; bpf = Blows per Foot; mpf = Minute per Foot
WOR = Weight of Rods; WOH = Weight of Hammer; RQD = Rock Quality Designation; PID = Photoionization Detector
S_v = Field Vane Shear Strength, kips/sq.ft.; q_U = Unconfined Compressive Strength, kips/sq.ft.; Ø = Friction Angle (Estimated); N/A = Not Applicable

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	SAMPLE INFORMATION: Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_2O Depth	Remarks
			1D		0-2	24/16	1-1-1-2			0.4 Vegetation / Topsoil (FILL)		
			2D		2-4	24/22	3-3-4-3			Loose, brown and gray-brown, clayey SILT, trace sand, wit rootlets (FILL)		
255										3.5		
	5		3D		5-7	24/22	3-4-5-5	q_P=6-7 ksf		4.0 Loose, dark gray, clayey SILT, with black organics		
			4D		7-9	24/24	5-5-5-5	q_P=4 ksf		Very stiff, brown, silty CLAY, with frequent sand seams	▽	
250										7.0 Brown, layered, stiff silty CLAY, and medium dense silty fine SAND		
	10		5D		10-12	24/24	1-1/12"-1			10.0 Medium, gray, silty CLAY		
			6D		12-14	24/20	1-1-1-2					
245												
	15		7D		15-17	24/18	2-1-1-1			15.0 Loose, brown to gray, silty fine SAND, with frequent silty clay seams		
240												
	20		8D		20-22	24/20	WOH/18"-2			20.0 Gray, layered, medium silty CLAY and loose silty fine SAND		

Bottom of Exploration at 22.3 feet

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

BORING LOG

BORING NO.: B-205
SHEET: 1 of 1
PROJECT NO. 21-0920.1
DATE START: 5/2/2024
DATE FINISH: 5/2/2024

CLIENT: Woodard & Curran, Inc.
PROJECT: Proposed Engine 2 Fire Station Replacement
LOCATION: 180 South Main Street, Auburn, ME

Drilling Information

LOCATION: See Exploration Location Plan | **ELEVATION (FT):** 257' +/- | **TOTAL DEPTH (FT):** 32.0 | **LOGGED BY:** Evan Walker
DRILLING CO.: Seaboard Drilling | **DRILLER:** Kevin Hanscom | **DRILLING METHOD:** Cased Boring
RIG TYPE: Track Mounted Diedrich D-50 | **AUGER ID/OD:** N/A / N/A | **SAMPLER:** Standard Split-Spoon
HAMMER TYPE: Automatic / Automatic | **HAMMER WEIGHT (lbs):** 140 / 140 | **CASING ID/OD:** 4 in / 4 1/2 in | **CORE BARREL:** N/A
HAMMER CORRECTION FACTOR: | **HAMMER DROP (inch):** 30 / 30
WATER LEVEL DEPTHS (ft): ▽ 7 ft Soils Saturated at Surface, and Below 7' +/-
GENERAL NOTES:

KEY TO NOTES AND SYMBOLS:
Water Level: ▽ At time of Drilling; ▼ At Completion of Drilling; ▼ After Drilling
D = Split Spoon Sample; U = Thin Walled Tube Sample; R = Rock Core Sample; V = Field Vane Shear
Pen. = Penetration Length; Rec. = Recovery Length; bpf = Blows per Foot; mpf = Minute per Foot
WOR = Weight of Rods; WOH = Weight of Hammer; RQD = Rock Quality Designation; PID = Photoionization Detector
S_v = Field Vane Shear Strength, kips/sq.ft.; q_U = Unconfined Compressive Strength, kips/sq.ft.; Ø = Friction Angle (Estimated); N/A = Not Applicable

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_20 Depth	Remarks
			1D		0-2	24/18	1/12"-2-2			0.5 Vegetation / Topsoil		
255			2D		2-4	24/20	3-4-4-5	q_P=6-7 ksf		2.0 Loose, gray-brown, clayey SILT AND SAND, with rootlets and organics Very stiff to stiff, brown, silty CLAY, with frequent sand seams		
	5		3D		5-7	24/24	3-5-5-5	q_P=5-7 ksf w =24.5 %				
250			4D		7-9	24/24	5-7-7-5	q_P=7 ksf		7.0 Layered, brown, stiff silty CLAY, clayey SILT, and medium dense silty SAND	▽	
	10		5D		10-12	24/24	WOH-1/12"-2	w =34.3 %		10.0 Medium, gray, silty CLAY, with frequent sand seams		
245												
	15		6D		15-17	24/20	WOH-2-1/12"			15.0 Layered, gray, medium silty CLAY and loose silty SAND		
240												
	20		7D		20-22	24/24	WOH/24"					
235										21.5 Loose, gray, silty SAND, trace gravel		
	25		8D		25-27	24/24	1-1-5-9					
230										26.5 Medium dense to very dense, gray, gravelly silty SAND (Till)		
	30		9D		30-32	24/24	27-36-46-48					
225										Bottom of Exploration at 32.0 feet		

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

BORING LOG

BORING NO.: B-101
SHEET: 1 of 1
PROJECT NO. 21-0920
DATE START: 5/16/2023
DATE FINISH: 5/16/2023

CLIENT: Woodard & Curran, Inc.
PROJECT: Proposed Engine 2 Fire Station Replacement
LOCATION: 180 South Main Street, Auburn, ME

Drilling Information

LOCATION: See Exploration Location Plan | **ELEVATION (FT):** 258' +/- | **TOTAL DEPTH (FT):** 25.4 | **LOGGED BY:** Evan Walker
DRILLING CO.: S. W. Cole Explorations, LLC | **DRILLER:** Matt Bussey | **DRILLING METHOD:** Hollow Stem Auger
RIG TYPE: Track Mounted Mobile Drill B-48 | **AUGER ID/OD:** 2 1/4 in / 5 5/8 in | **SAMPLER:** Standard Split-Spoon
HAMMER TYPE: Automatic | **HAMMER WEIGHT (lbs):** 140 | **CASING ID/OD:** N/A /N/A | **CORE BARREL:**
HAMMER CORRECTION FACTOR: | **HAMMER DROP (inch):** 30
WATER LEVEL DEPTHS (ft): ▽ 10 ft Soils Moist from Surface, Wet to Saturated Below 10' +/-
GENERAL NOTES:

KEY TO NOTES AND SYMBOLS:
Water Level: ▽ At time of Drilling; ▼ At Completion of Drilling; ▼ After Drilling
D = Split Spoon Sample; U = Thin Walled Tube Sample; R = Rock Core Sample; V = Field Vane Shear
Pen. = Penetration Length; Rec. = Recovery Length; bpf = Blows per Foot; mpf = Minute per Foot
WOR = Weight of Rods; WOH = Weight of Hammer; RQD = Rock Quality Designation; PID = Photoionization Detector
S_v = Field Vane Shear Strength, kips/sq.ft.; q_U = Unconfined Compressive Strength, kips/sq.ft.; Ø = Friction Angle (Estimated); N/A = Not Applicable

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_20 Depth	Remarks
			1D		0-2	24/18	1-2-3-3			0.5 Vegetation / Topsoil		
			2D		2-4	24/22	4-6-7-11	q_P=6 to 9 ksf		2.0 Damp, loose, gray-brown, clayey SILT, some fine sand, with roots and organics		
255										Damp, very stiff to stiff, brown, silty CLAY, with frequent sand seams and layers		
	5		3D		5-7	24/22	4-3-4-6	q_P=5 to 6 ksf				
250										8.0 Wet to Saturated, varved, medium gray silty CLAY, loose gray-brown silty fine SAND, and loose SILT AND FINE SAND, some clay	▽	
	10		4D		10-12	24/24	1-2-1-3					
			5D		12-14	24/24	1-1-3-3					
245												
	15		6D		15-17	24/22	WOH-1-2-2			15.0 Saturated, stiff to medium, gray, silty CLAY, with frequent sand seams and layers		
240										18.0 Saturated, loose to medium dense, gray, SILT AND SAND, trace gravel (Till)		
	20		7D		20-22	24/20	2-1-1-5					
235												
	25		8D		25-25.4	5/4	50/5"			Bottom of Exploration at 25.4 feet		

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

BORING LOG

BORING NO.: B-102
SHEET: 1 of 1
PROJECT NO. 21-0920
DATE START: 5/16/2023
DATE FINISH: 5/16/2023

CLIENT: Woodard & Curran, Inc.
PROJECT: Proposed Engine 2 Fire Station Replacement
LOCATION: 180 South Main Street, Auburn, ME

Drilling Information

LOCATION: See Exploration Location Plan **ELEVATION (FT):** 261' +/- **TOTAL DEPTH (FT):** 21.3 **LOGGED BY:** Evan Walker
DRILLING CO.: S. W. Cole Explorations, LLC **DRILLER:** Matt Bussey **DRILLING METHOD:** Hollow Stem Auger
RIG TYPE: Track Mounted Mobile Drill B-48 **AUGER ID/OD:** 2 1/4 in / 5 5/8 in **SAMPLER:** Standard Split-Spoon
HAMMER TYPE: Automatic **HAMMER WEIGHT (lbs):** 140 **CASING ID/OD:** N/A /N/A **CORE BARREL:**
HAMMER CORRECTION FACTOR: **HAMMER DROP (inch):** 30
WATER LEVEL DEPTHS (ft): ▽ 10 ft Soils Damp to Moist from Surface, Wet to Saturated Below 10' +/-
GENERAL NOTES:

KEY TO NOTES AND SYMBOLS:
Water Level: ▽ At time of Drilling; ▼ At Completion of Drilling; ▼ After Drilling
D = Split Spoon Sample; U = Thin Walled Tube Sample; R = Rock Core Sample; V = Field Vane Shear
Pen. = Penetration Length; Rec. = Recovery Length; bpf = Blows per Foot; mpf = Minute per Foot
WOR = Weight of Rods; WOH = Weight of Hammer; RQD = Rock Quality Designation; PID = Photoionization Detector
S_v = Field Vane Shear Strength, kips/sq.ft.; q_U = Unconfined Compressive Strength, kips/sq.ft.; Ø = Friction Angle (Estimated); N/A = Not Applicable

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	SAMPLE INFORMATION: Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_2O Depth	Remarks
260			1D		0-2	24/20	1-3-3-5	q_P=7 ksf		Vegetation / Topsoil		
										1.0 Moist, very stiff, brown, silty CLAY, with roots		
			2D		2-4	24/22	4-6-5-7	q_P=5 to 6 ksf		2.0 Damp, very stiff to stiff, brown, silty CLAY, with frequent sand seams and layers		
	5		3D		5-7	24/24	2-3-3-3	q_P=2 to 5 ksf				
255												
	10		4D		10-12	24/18	1/12"-1-1	q_P=0.5 to 1 ksf		10.0 Wet to saturated, brown to gray, varved medium silty CLAY and loose silty fine SAND	▽	
250			5D		12-14	24/24	1-2-1-1	q_P=0.5 ksf		12.0 Saturated, medium, gray, silty CLAY, with frequent sand seams		
	15		6D		15-17	24/16	5-1-2-17			14.5 Saturated, gray to rust-brown, silty SAND, some gravel, with occasional cobbles (Till)		
245												
	20		7D		20-22	24/16	18-41-50					
240										Bottom of Exploration at 21.3 feet		

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

BORING LOG

BORING NO.: B-103
SHEET: 1 of 1
PROJECT NO. 21-0920
DATE START: 5/16/2023
DATE FINISH: 5/16/2023

CLIENT: Woodard & Curran, Inc.
PROJECT: Proposed Engine 2 Fire Station Replacement
LOCATION: 180 South Main Street, Auburn, ME

Drilling Information

LOCATION: See Exploration Location Plan **ELEVATION (FT):** 258.5' +/- **TOTAL DEPTH (FT):** 19.1 **LOGGED BY:** Evan Walker
DRILLING CO.: S. W. Cole Explorations, LLC **DRILLER:** Matt Bussey **DRILLING METHOD:** Hollow Stem Auger
RIG TYPE: Track Mounted Mobile Drill B-48 **AUGER ID/OD:** 2 1/4 in / 5 5/8 in **SAMPLER:** Standard Split-Spoon
HAMMER TYPE: Automatic **HAMMER WEIGHT (lbs):** 140 **CASING ID/OD:** N/A /N/A **CORE BARREL:**
HAMMER CORRECTION FACTOR: **HAMMER DROP (inch):** 30
WATER LEVEL DEPTHS (ft): ▽ 10 ft Soils Damp to Moist from Surface, Wet to Saturated Below 10' +/-
GENERAL NOTES:

KEY TO NOTES AND SYMBOLS:
Water Level: ▽ At time of Drilling; ▼ At Completion of Drilling; ▼ After Drilling
D = Split Spoon Sample; U = Thin Walled Tube Sample; R = Rock Core Sample; V = Field Vane Shear
Pen. = Penetration Length; Rec. = Recovery Length; bpf = Blows per Foot; mpf = Minute per Foot
WOR = Weight of Rods; WOH = Weight of Hammer; RQD = Rock Quality Designation; PID = Photoionization Detector
S_v = Field Vane Shear Strength, kips/sq.ft.; q_U = Unconfined Compressive Strength, kips/sq.ft.; Ø = Friction Angle (Estimated); N/A = Not Applicable

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	SAMPLE INFORMATION: Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_20 Depth	Remarks
			1D		0-2	24/24	1-3-3-6			Vegetation / Topsoil		
										1.3 Moist, stiff, brown, silty CLAY, with roots		
			2D		2-4	24/22	5-7-7-10	q_P=7 ksf		2.0 Damp to wet, very stiff to stiff, brown, silty CLAY, with frequent sand seams		
255												
	5		3D		5-7	24/24	4-3-5-6	q_P=6 to 7 ksf				
250												
	10		4D		10-12	24/24	1-1-2-2	q_P=1 to 1.5 ksf			▽	
										10.5 Wet to saturated, stiff, gray, silty CLAY, with frequent sand seams and layers		
										12.5 Medium dense, gray, SILT AND SAND, some gravel (Till)		
245												
	15		5D		15-17	24/24	10-7-7-6					
240												

Refusal at 19.1 feet
Probable Boulder or Bedrock

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

BORING LOG

BORING NO.: B-104
SHEET: 1 of 1
PROJECT NO. 21-0920
DATE START: 5/16/2023
DATE FINISH: 5/16/2023

CLIENT: Woodard & Curran, Inc.
PROJECT: Proposed Engine 2 Fire Station Replacement
LOCATION: 180 South Main Street, Auburn, ME

Drilling Information

LOCATION: See Exploration Location Plan **ELEVATION (FT):** 257' +/- **TOTAL DEPTH (FT):** 29.9 **LOGGED BY:** Evan Walker
DRILLING CO.: S. W. Cole Explorations, LLC **DRILLER:** Matt Bussey **DRILLING METHOD:** Hollow Stem Auger
RIG TYPE: Track Mounted Mobile Drill B-48 **AUGER ID/OD:** 2 1/4 in / 5 5/8 in **SAMPLER:** Standard Split-Spoon
HAMMER TYPE: Automatic **HAMMER WEIGHT (lbs):** 140 **CASING ID/OD:** N/A /N/A **CORE BARREL:**
HAMMER CORRECTION FACTOR: **HAMMER DROP (inch):** 30
WATER LEVEL DEPTHS (ft): ▽ 10 ft Soils Damp to Moist from Surface, Saturated Below 10' +/-
GENERAL NOTES:

KEY TO NOTES AND SYMBOLS:
Water Level: ▽ At time of Drilling; ▼ At Completion of Drilling; ▼ After Drilling
D = Split Spoon Sample; U = Thin Walled Tube Sample; R = Rock Core Sample; V = Field Vane Shear
Pen. = Penetration Length; Rec. = Recovery Length; bpf = Blows per Foot; mpf = Minute per Foot
WOR = Weight of Rods; WOH = Weight of Hammer; RQD = Rock Quality Designation; PID = Photoionization Detector
S_v = Field Vane Shear Strength, kips/sq.ft.; q_u = Unconfined Compressive Strength, kips/sq.ft.; Ø = Friction Angle (Estimated); N/A = Not Applicable

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	SAMPLE INFORMATION: Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_20 Depth	Remarks
			1D		0-2	24/24	1-2-2-4			0.5 Vegetation / Topsoil Damp, stiff, brown, silty CLAY, with roots		
255			2D		2-4	24/24	4-7-7-9			2.0 Damp to moist, very stiff, brown, silty CLAY, with frequent sand seams and layers		
	5		3D		5-7	24/22	3-2-3-2					
250												
	10		4D		10-12	24/24	1-1-1-2			10.0 Saturated, stiff, gray-brown, silty CLAY, with frequent sand seams 11.0 Saturated, stiff to medium, gray, silty CLAY, with frequent sand seams	▽	
245												
	15		5D		15-17	24/20	1-2-2-1			15.0 Saturated, loose, gray, silty fine SAND, with frequent silty clay seams and layers ROD PROBE Depth 17-29.5 / Resistance HYD / Interpreted Soil Type Silty Clay		
240												
	20											
235												
	25											
230										29.5 ROD PROBE Depth 29.5-29.9 / Resistance 50 / Interpreted Soil Type Granular Soils		

Bottom of Exploration at 29.9 feet

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

BORING LOG

BORING NO.: B-105
SHEET: 1 of 1
PROJECT NO. 21-0920
DATE START: 5/16/2023
DATE FINISH: 5/16/2023

CLIENT: Woodard & Curran, Inc.
PROJECT: Proposed Engine 2 Fire Station Replacement
LOCATION: 180 South Main Street, Auburn, ME

Drilling Information

LOCATION: See Exploration Location Plan **ELEVATION (FT):** 258' +/- **TOTAL DEPTH (FT):** 23.0 **LOGGED BY:** Evan Walker
DRILLING CO.: S. W. Cole Explorations, LLC **DRILLER:** Matt Bussey **DRILLING METHOD:** Hollow Stem Auger
RIG TYPE: Track Mounted Mobile Drill B-48 **AUGER ID/OD:** 2 1/4 in / 5 5/8 in **SAMPLER:** Standard Split-Spoon
HAMMER TYPE: Automatic **HAMMER WEIGHT (lbs):** 140 **CASING ID/OD:** N/A /N/A **CORE BARREL:**
HAMMER CORRECTION FACTOR: **HAMMER DROP (inch):** 30
WATER LEVEL DEPTHS (ft): ▽ 10 ft Soils Moist to Wet from Surface, Saturated Below 10' +/-
GENERAL NOTES:

KEY TO NOTES AND SYMBOLS:
Water Level: ▽ At time of Drilling; ▼ At Completion of Drilling; ▼ After Drilling
D = Split Spoon Sample; U = Thin Walled Tube Sample; R = Rock Core Sample; V = Field Vane Shear
Pen. = Penetration Length; Rec. = Recovery Length; bpf = Blows per Foot; mpf = Minute per Foot
WOR = Weight of Rods; WOH = Weight of Hammer; RQD = Rock Quality Designation; PID = Photoionization Detector
S_v = Field Vane Shear Strength, kips/sq.ft.; q_u = Unconfined Compressive Strength, kips/sq.ft.; Ø = Friction Angle (Estimated); N/A = Not Applicable

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	SAMPLE INFORMATION: Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_2O Depth	Remarks
			1D		0-2	24/22	WOH/12"-3-5			Vegetation / Wet, dark brown, clayey SILT, with roots and organics		
										1.5 Wet, stiff, gray-brown, silty CLAY, with roots		
255			2D		2-4	24/24	5-6-7-9	q_P=6 to 7 ksf		2.0 Moist to wet, very stiff, gray-brown, silty CLAY, with frequent sand seams and layers		
	5		3D		5-7	24/20	3-3-3-5	q_P=4 to 6 ksf		5.0 Wet, very stiff to stiff, gray-brown, silty CLAY, with frequent sand seams and layers		
250										8.0 Wet to saturated, varved, loose brown gravelly silty SAND, loose brown silty fine sand, and stiff brown silty CLAY		
	10		4D		10-12	24/16	4-3-4-2				▽	
245												
	15		5D		15-17	24/24	1-1-1-2			15.0 Saturated, varved, loose gray silty fine SAND, and medium gray silty CLAY		
240										ROD PROBE: Depth 17-21; Resistance HYD; Interpreted Soil Type Silty Clay		
	20									21.0 ROD PROBE: Depth 21-22, Resistance 52, Granular Soils; Depth 22-23, Resistance 68		
235										Bottom of Exploration at 23.0 feet		

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

KEY TO NOTES & SYMBOLS

Test Boring and Test Pit Explorations

Stratification lines represent the approximate boundary between soil types and the transition may be gradual.

Key to Symbols Used:

w	-	water content, percent (dry weight basis)
q_u	-	unconfined compressive strength, kips/sq. ft. - laboratory test
S_v	-	field vane shear strength, kips/sq. ft.
L_v	-	lab vane shear strength, kips/sq. ft.
q_p	-	unconfined compressive strength, kips/sq. ft. – pocket penetrometer test
O	-	organic content, percent (dry weight basis)
W_L	-	liquid limit - Atterberg test
W_P	-	plastic limit - Atterberg test
WOH	-	advance by weight of hammer
WOM	-	advance by weight of man
WOR	-	advance by weight of rods
HYD	-	advance by force of hydraulic piston on drill
RQD	-	Rock Quality Designator - an index of the quality of a rock mass.
γ_T	-	total soil weight
γ_B	-	buoyant soil weight

Description of Proportions:

Trace:	0 to 5%
Some:	5 to 12%
"Y"	12 to 35%
And	35+%
With	Undifferentiated

Description of Stratified Soils

Parting:	0 to 1/16" thickness
Seam:	1/16" to 1/2" thickness
Layer:	½" to 12" thickness
Varved:	Alternating seams or layers
Occasional:	one or less per foot of thickness
Frequent:	more than one per foot of thickness

REFUSAL: **Test Boring Explorations** - Refusal depth indicates that depth at which, in the drill foreman's opinion, sufficient resistance to the advance of the casing, auger, probe rod or sampler was encountered to render further advance impossible or impracticable by the procedures and equipment being used.

REFUSAL: **Test Pit Explorations** - Refusal depth indicates that depth at which sufficient resistance to the advance of the backhoe bucket was encountered to render further advance impossible or impracticable by the procedures and equipment being used.

Although refusal may indicate the encountering of the bedrock surface, it may indicate the striking of large cobbles, boulders, very dense or cemented soil, or other buried natural or man-made objects or it may indicate the encountering of a harder zone after penetrating a considerable depth through a weathered or disintegrated zone of the bedrock.

CPT-1

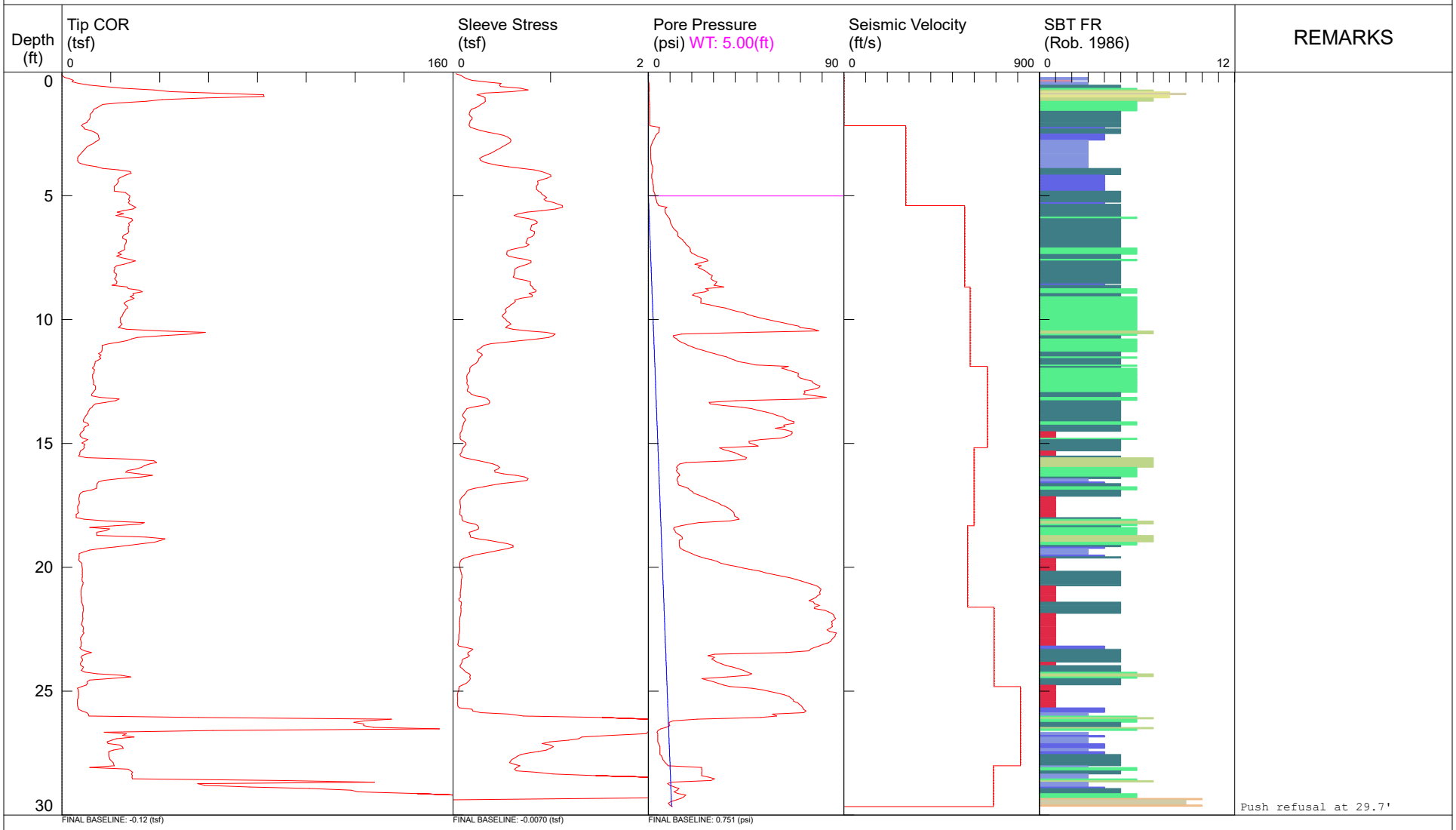
SEABOARD DRILLING

COMPANY: Seaboard Drilling
PROJECT: Proposed Engine 2 Fire Station
SITE: 180 South Main Street
LOCATION: Auburn, ME
CLIENT: S. W. Cole Engineering, Inc.

OPERATOR: Kevin Hanscom

FILENAME: CPT-101.DAT

TEST ID: CPT-1
TEST DATE: Mon 26/Aug/2024
GROUND SURFACE ELEV.: 000 +/-
TOTAL DEPTH: 29.659 ft



PROBE ID: 4644.163XX

1 Sensitive fine grained
2 Organic material
3 Clays
4 Silty clay to clay
5 Clayey silt to silty clay
6 Sandy silt to clayey silt
7 Silty sand to sandy silt
8 sand to silty sand
9 Sand
10 Gravelly sand to sand
11 Very stiff fine grained **
12 Sand to clayey sand **

*SBT: Robertson 1986; **Overconsolidated or Cemented; *SBT/SPT CORRELATION: UBC-1983

CPT-2

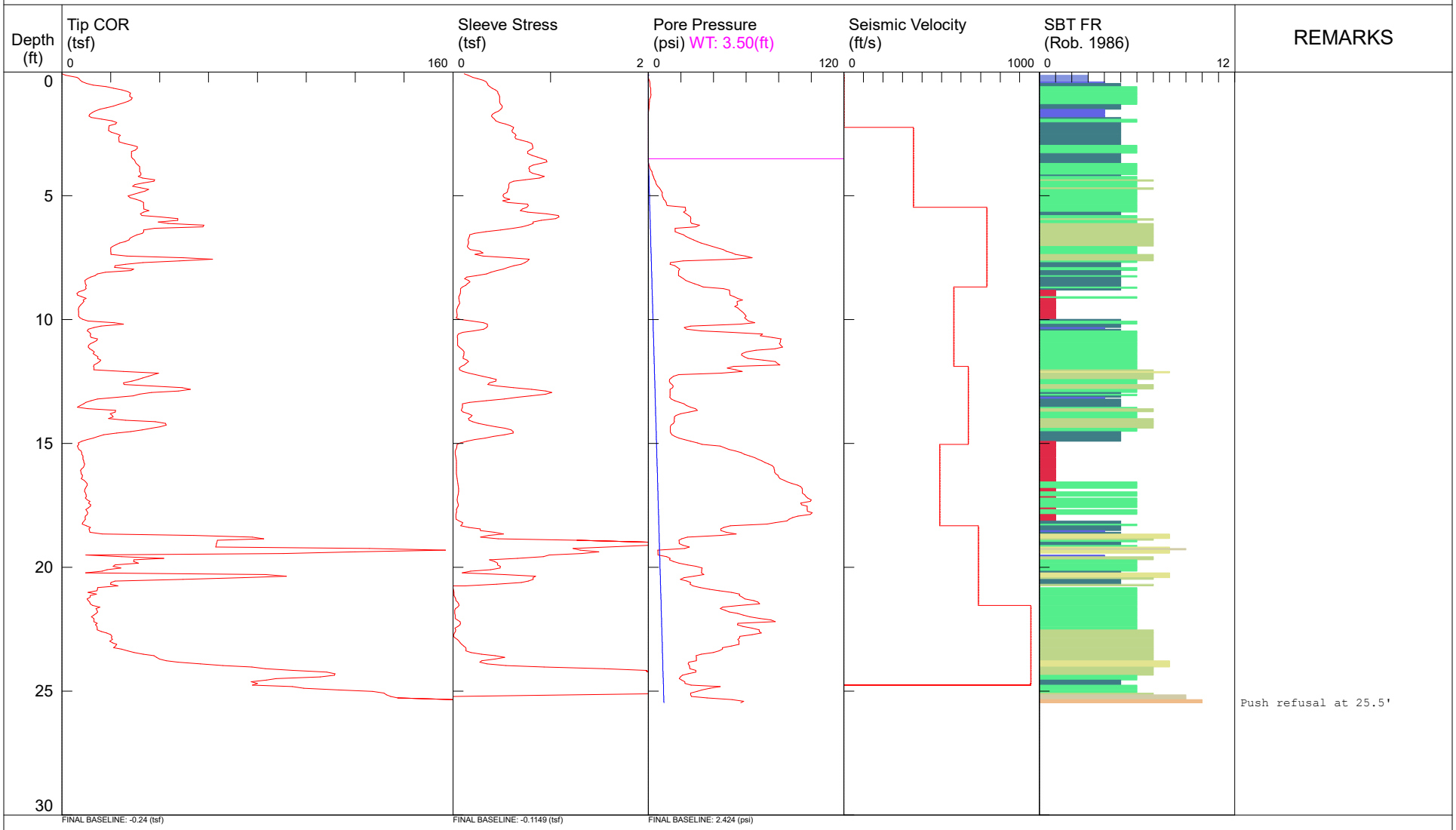
SEABOARD DRILLING

COMPANY: Seaboard Drilling
PROJECT: Proposed Engine 2 Fire Station
SITE: 180 South Main Street
LOCATION: Auburn, ME
CLIENT: S. W. Cole Engineering, Inc.

OPERATOR: Kevin Hanscom

FILENAME: CPT-102 .DAT

TEST ID: CPT-2
TEST DATE: Mon 26/Aug/2024
GROUND SURFACE ELEV.: 000 +/-
TOTAL DEPTH: 25.476 ft



REMARKS

Push refusal at 25.5'

PROBE ID: 4644.163XX

1 Sensitive fine grained
2 Organic material
3 Clays
4 Silty clay to clay
5 Clayey silt to silty clay
6 Sandy silt to clayey silt
7 Silty sand to sandy silt
8 sand to silty sand
9 Sand
10 Gravelly sand to sand
11 Very stiff fine grained **
12 Sand to clayey sand **

*SBT: Robertson 1986; **Overconsolidated or Cemented; *SBT/SPT CORRELATION: UBC-1983

CPT-3

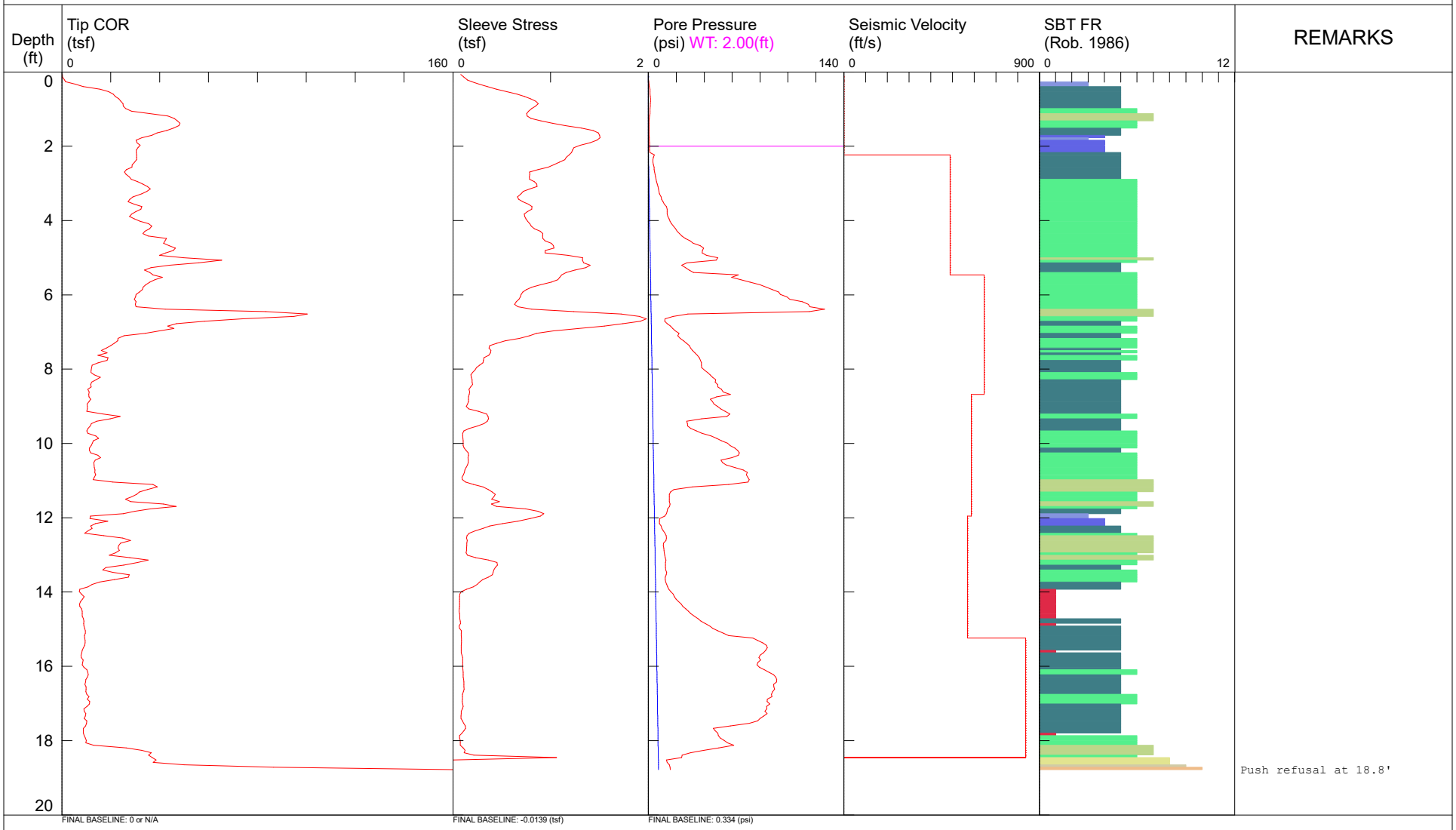
SEABOARD DRILLING

COMPANY: Seaboard Drilling
PROJECT: Proposed Engine 2 Fire Station
SITE: 180 South Main Street
LOCATION: Auburn, ME
CLIENT: S. W. Cole Engineering, Inc.

OPERATOR: Kevin Hanscom

FILENAME: CPT-103.DAT

TEST ID: CPT-3
TEST DATE: Mon 26/Aug/2024
GROUND SURFACE ELEV.: 000 +/-
TOTAL DEPTH: 18.783 ft



REMARKS

Push refusal at 18.8'

PROBE ID: 4644.163XX

1 Sensitive fine grained
2 Organic material
3 Clays
4 Silty clay to clay
5 Clayey silt to silty clay
6 Sandy silt to clayey silt
7 Silty sand to sandy silt
8 sand to silty sand
9 Sand
10 Gravelly sand to sand
11 Very stiff fine grained **
12 Sand to clayey sand **

*SBT: Robertson 1986; **Overconsolidated or Cemented; *SBT/SPT CORRELATION: UBC-1983

Hydrologic Soil Group—Androscoggin and Sagadahoc Counties, Maine
(Auburn Engine #2 HSG)

Map Scale: 1:2,450 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 35 70 140 210

Feet: 0 100 200 400 600

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 Rating Polygons

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

Soil Rating Lines

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

Soil Rating Points

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

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: Androscoggin and Sagadahoc Counties, Maine
Survey Area Data: Version 25, Aug 26, 2024

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

Date(s) aerial images were photographed: Jul 11, 2021—Oct 29, 2021

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

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
BgB	Nicholville very fine sandy loam, 0 to 8 percent slopes	C	4.6	18.4%
BgC	Nicholville very fine sandy loam, 8 to 15 percent slopes	C	0.9	3.7%
HfB	Hartland very fine sandy loam, 2 to 8 percent slopes	B	4.8	19.2%
HfC2	Hartland very fine sandy loam, 8 to 15 percent slopes, eroded	B	4.6	18.2%
HrB	Lyman-Tunbridge complex, 0 to 8 percent slopes, rocky	D	6.0	23.7%
ScA	Scantic silt loam, 0 to 3 percent slopes	D	4.2	16.7%
Totals for Area of Interest			**25.2**	**100.0%**

Description

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

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

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

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

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

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

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

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

APPENDIX C: STORMWATER OPERATIONS & MAINTENANCE PLAN

STORMWATER MANAGEMENT SYSTEM OPERATION AND MAINTENANCE PLAN

City of Auburn, ME
Engine #2

Prepared for:
City of Auburn
60 Court Street
Auburn, Maine 04210

Prepared By:
12 Mountfort Street
Portland, ME 04101
800.426.4262

0233981.13
December 2024

woodardcurran.com

STORMWATER MANAGEMENT SYSTEM OPERATION & MAINTENANCE PLAN

This Stormwater Management System Operations & Maintenance Plan (the Plan) assumes that the City of Auburn, ME will maintain an effective stormwater management system at the following:

180 South Main Street
Auburn, ME 04210

herein referred to as "the Site". Periodic and scheduled inspection and maintenance measures are recommended to prevent deficiencies and to promote the proper performance of the stormwater management system. Failure to implement these measures can reduce the hydraulic capacity and the pollutant removal efficiency of stormwater measures, which may result in poor water quality of stormwater runoff discharging from the Site.

Responsible Party & Estimated Annual Budget

Woodard and Curran (W&C) has been informed that the City of Auburn, ME will define responsibilities for operation and maintenance at the Site. The City of Auburn is responsible for implementing this Plan and identifying the source of necessary funding is as follows:

City of Auburn, Maine
60 Court St
Auburn, ME 04210

The estimated annual budget for implementing this Plan is $10,000.

Good Housekeeping

The Site will be maintained as clean and orderly. Routine inspections of the Site for debris and sediment accumulations shall be performed. Debris and sediment shall be disposed of in accordance with local and State requirements.

Stormwater System Maintenance

Stormwater management is provided by deep sump catch basins, a subsurface detention system, and an outlet control structure. These measures are illustrated on the project plans. Routine inspections and maintenance of the stormwater management system shall be performed in accordance with **Table 1** of this report for the Site. These measures are recommended to prevent deficiencies with the system that may result in poor quality stormwater runoff.

Landscape Management

Lawn and landscaped areas shall be inspected for patches of dead vegetation and erosion. If these conditions occur, effected areas shall be stabilized and replanted with vegetation to prevent sediment from entering the stormwater management system.

The following additional measures are provided in an effort to minimize the potential for runoff pollution due to overwatering, dead vegetation and erosion, direct disposal of lawn clippings, and over-application of materials such as fertilizers and pesticides.

Lawn Mowing

The following mowing practices are recommended:

- Maintain sharp mower blades.
- Grass shall not be cut shorter than 2 to 3 inches to minimize weed growth. Grass can be cut lower in the spring and fall to stimulate root growth, but no shorter than 1½ inches.
- Do not dispose of grass clippings within the stormwater management system.
- Employ practices to minimize the potential for grass clippings to enter the stormwater management system.

Fertilizers & Pesticides

Use of pesticides and fertilizers should be minimized to the extent practicable. Application of these materials may degrade the quality of stormwater runoff and should therefore be applied judiciously. In addition, fertilizers and pesticides shall not be applied when rain is expected. These materials should be stored under cover to prevent their exposure to stormwater.

Inspections & Maintenance Measures

The stormwater management system at the Site consists of a deep sump catch basins, a detention system, and an outlet control structure. The best management practices are illustrated in **FIGURE A**. provides the Inspection Form that is recommended for use during routine inspections of the system. The form includes a table (**Table 1**) that outlines specific inspection and maintenance measures for the detention system, in addition to the following information:

- Name of inspector
- Name of the site and its location
- Date and time of inspection
- Weather conditions during inspection
- Outline of items inspected
- Condition of the stormwater management measures, including corrective measures taken to maintain the system

At a minimum, inspect the stormwater management system twice a year. Completed Inspections Forms should be kept at the Site to enable both facility managers and regulatory agencies to ensure that operation of the system is in compliance with permit requirements and submitted to the City Engineer's office.

Long-Term Pollution Prevention Plan

Good Housekeeping Practices

Prevent or reduce pollutant runoff from the project development through the use of street sweeping, and erosion and catch basin cleaning.

Provisions for storing materials and waste products inside or under cover: All materials stored on site shall be stored in a neat and orderly fashion in their appropriate containers and under a roof or other secure enclosure. Waste products should be placed in secure receptacles until they are emptied by a licensed solid waste management company in Massachusetts.

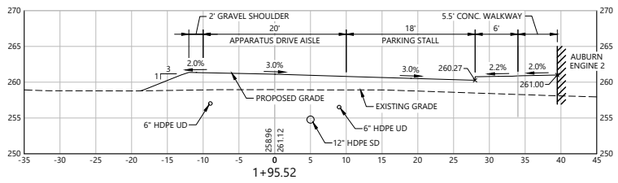
Spill Prevention and Response Plans

Prevention: All materials and equipment stored on site shall be stored in a neat and orderly fashion in their appropriate containers and under a roof or other secure enclosure. Products will be kept in their original containers with the original manufacturer's label. Products should not be mixed with one another unless recommended by the manufacturer. If possible, all of the product should be used up before disposing of the container. The manufacturer's recommendations for proper use and disposal should be followed.

Response: Manufacturer's recommended methods for cleanup shall be followed. Spills should be cleaned up immediately after discovery. The spill area shall be kept well-ventilated, and personnel shall wear appropriate protective clothing to prevent injury from contact with a hazardous substance. Spills of toxic or hazardous material shall be reported to the appropriate State and/or local authority in accordance with local and/or State regulations.

FIGURE A – STORMWATER BEST MANAGEMENT PRACTICES

24x36



STRUCTURE TABLE				
NAME	DIA.	RIM	INV IN/SIZE/FROM	INV OUT/SIZE/TO
CB-1	4'	257.50		253.62/18"HDPE/DMH-1
CB-2	4'	257.99	253.52/6"HDPE/	254.23/12"HDPE/DMH-3
CB-3	4'	260.05	254.65/6"HDPE/	253.77/12"HDPE/DMH-2
CB-4	4'	260.23		254.78/12"HDPE/DMH-3
CB-5	4'	259.74		255.00/12"HDPE/DMH-4
CB-6	4'	259.88	254.26/6"HDPE/	255.11/12"HDPE/DMH-4
DMH-1	4'	257.83	253.38/12"HDPE/OCS-1 253.52/18"HDPE/CB-1 252.68/18"HDPE/CB-5	253.35/18"HDPE/EX. CB3
DMH-2	5'	260.33	253.83/12"HDPE/CB-3 253.92/12"HDPE/DMH-3 254.10/6"HDPE/ROOL	
DMH-3	5'	260.87	254.11/12"HDPE/CB-4 256.26/6"HDPE/CO 256.26/6"HDPE/ROOF DRAIN	254.01/12"HDPE/DMH-2
DMH-4	4'	260.37	254.83/12"HDPE/CB-6 254.83/12"HDPE/CB-5	254.72/12"HDPE/DMH-3
DMH-5	4'	258.15	253.68/12"HDPE/CB-2	253.68/12"HDPE/
OCS-1	???	257.99	253.47/15"HDPE/	253.47/15"HDPE/DMH-1

Woodard & Curran
12 Mountfort Street
Portland, Maine 04101
800.426.4262 | www.woodardcurran.com

simons architects
designed for human potential
Allied Engineering
Structural Mechanical Electrical Plumbing
context ARCHITECTURE
Thornton Tomasetti

PE SEAL:

PERMIT DESIGN NOT FOR CONSTRUCTION

CLIENT INFO:

CITY OF AUBURN
180 SOUTH MAIN STREET
AUBURN, MAINE 04210

AUBURN ENGINE 2

REV.	MM/DD/YY	DESCRIPTION

JOB NO:	233981.13
DATE:	DECEMBER 2024
SCALE:	AS NOTED
DESIGNED BY:	RA
DRAWN BY:	JBC
CHECKED BY:	CGS
FILENAME:	233981.13 C-0-104.dwg

DRAWING TITLE:

O&M PLAN
BMP
LOCATIONS

DRAWING NO:

FIGURE A

\\woodardcurran.net\shares\Projects\02\233981.13 auburn me engine 2 fs design\wip\Drawings\Civil\233981.13 C-0-104.dwg, Dec 03, 2024 - 8:07pm JCOUCOMBE

ATTACHMENT A – INSPECTION FORM

STORMWATER MANAGEMENT SYSTEM INSPECTION FORM

Engine 2 Fire Station
Auburn, Maine

Name of Inspector: _____

Date/Time: _____

Weather: _____

Date of Last Inspection: _____

Items Inspected (Refer to **Table 1**. Provide additional sheets if necessary.):

Comments & Corrective Actions Taken (Provide additional sheets if necessary.):

TABLE 1 – OPERATIONS & MAINTENANCE MEASURES

Subsurface Detention System	
Objective: *Maintain the storage capacity and removal efficiency of the proprietary structure.*	
Frequency	***Measure***
Ongoing/As Needed	• Remove obstructions that may limit runoff from entering the subsurface detention system, including sediment, trash, debris, and leaves. Remove sediment and other trapped pollutants at the frequency or level specified by the manufacturer. • A post-installation inspection should be performed to allow the owner to measure the invert prior to the accumulation of sediment. This survey will allow the monitoring of sediment build-up without requiring access to the detention system. The following is the recommended procedure for pre-inspections: 1) Locate the riser section or cleanouts of the retention/detention system. The riser will typically be 24" in diameter or larger and the cleanouts are usually 4", 6" or 8" in diameter. 2) Remove the lid of the riser or cleanouts. 3) Insert a measuring device into the opening and make note to a point of reference on the stick or string. (This is done so that sediment buildup can be determined in the future without having to enter the system.) • If measured sediment build-up is between 5% - 20% of the pipe diameter, cleaning should be considered; if sediment build-up exceeds 20%, cleaning should be performed at the earliest opportunity. A thorough cleaning of the system (manifolds and laterals) shall be performed by either manual methods or by a vacuum truck. • Inspect in accordance with manufacturer requirements, but no less than twice a year following installation, and no less than once a year thereafter.
After Heavy Rainfall Events[1]	• Inspect in accordance with manufacturer requirements.
As needed	• Note any standing water that may be present in the subsurface detention system. If standing water is evident in the system, repairs may be necessary. If repairs are not deemed necessary and standing water persists, the Owner should implement a yearly mosquito spray for the system during the spring of each year using EPA-registered products that do not pose unreasonable risks to human health, wildlife, or the environment. • Notify Owner of any system repairs needed and/or operational problems. The City is responsible for repairs and correcting operational problems not caused by improper construction.

[1] *At a minimum, an event accumulating approximately 2.71 inches of rainfall in a 24-hour period.*

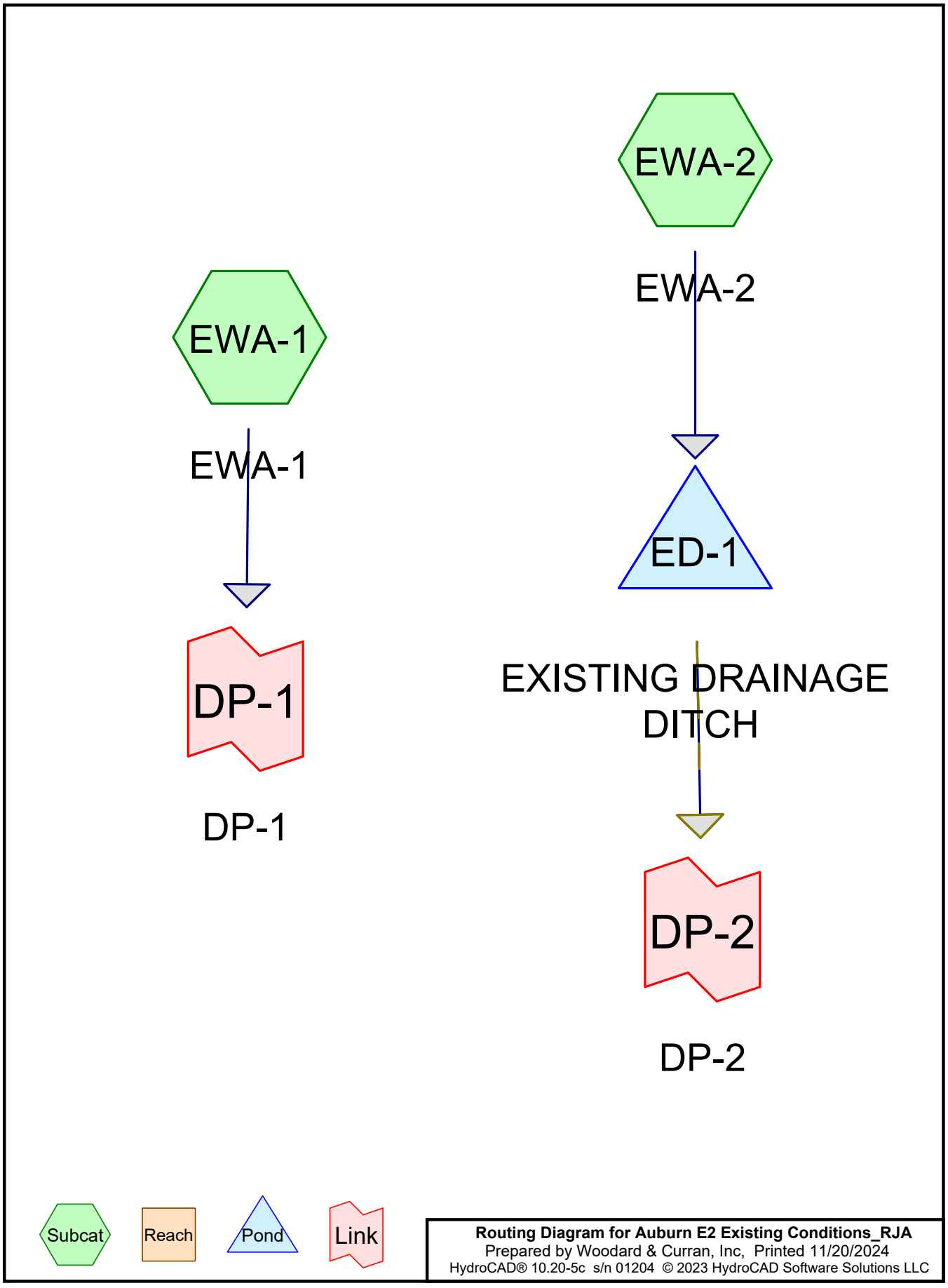
Closed Drainage System	
Objective: *Preserve the hydraulic capacity of the closed conduit drainage systems, including maintenance of the manholes. Drainage piping, deep sump hooded catch basins, and outlet control structures.*	
Frequency	***Measure***
INSPECTION:	
Ongoing/As Needed[1]	• Inspect drainage structure grates and covers for damage. Repair as necessary. Covers and grates shall not be welded to the frame so that the structure can be inspected and maintained.
MAINTENANCE:	
Ongoing/As Needed[1]	• Avoid placement of snow on top of drainage structure grates and covers. • Remove sediment from bottom of drainage structures whenever the depth of sediment is greater than or equal to half the sump depth. Dispose of sediment in accordance with all applicable regulations. • Remove obstructions that may impede flow through grates, including trash, debris, and accumulated grass clippings and leaves. Dispose of material in accordance with all applicable regulations. • Inspect drainage piping for structural deficiency and debris accumulation. Repair piping as required. Dispose material in accordance with all applicable regulations.
Annually	• Remove sediment from bottom of drainage structures when using ½ sump depth with sediment. Dispose of sediment in accordance with all applicable regulations.

Culvert	
Objective: *Preserve the hydraulic capacity of the culvert, including maintenance of the drainage ditch.*	
Frequency	***Measure***
INSPECTION:	
Ongoing/As Needed[1]	• Inspect drainage structure for damage and obstructions. Repair as necessary.
MAINTENANCE:	
Ongoing/As Needed[1]	• Remove obstructions that may impede flow through culvert, including trash, debris, and accumulated grass clippings and leaves. Dispose of material in accordance with all applicable regulations. • Inspect drainage piping for structural deficiency and debris accumulation. Repair piping as required. Dispose material in accordance with all applicable regulations.
Annually	• Remove vegetation and sediment from bottom of culvert when necessary. Dispose of sediment in accordance with all applicable regulations.

Grassed Drainage Ditches	
Objective: *Maintain the conveyance capacity and mitigate erosion through drainage channel.*	
Frequency	***Measure***
INSPECTION:	
Ongoing/As Needed	• Inspect channel for adequate vegetation and signs of rilling and gullying the first few months after construction and twice a year thereafter. • Inspect the channel for signs of soil erosion, ponding, and sediment accumulation.
MAINTENANCE:	
Ongoing/As Needed	• Repair any damaged rills or gullies as needed. • Replace dead vegetation as needed. • Mow grass as necessary. Grass height shall not exceed 6 inches. • Remove sediment and debris manually at least once a year. • Reseed as necessary.
NOTIFICATION:	
As Needed	• Notify Owner of any system repairs needed and/or operational problems.

Vegetated Areas	
Objective: *Identify active or potential erosion problems.*	
Frequency	***Measure***
INSPECTION:	
Ongoing/As Needed	• Inspect vegetated areas, particularly slopes and embankments, for signs of erosion during the growing season or after heavy rainfall.
MAINTENANCE:	
Ongoing/As Needed	• Replace dead vegetation as needed. • Mow grass as necessary. Grass height shall not exceed 6 inches. • Reseed as necessary.
NOTIFICATION:	
As Needed	• Notify Owner of any system repairs needed and/or operational problems.

APPENDIX D: HYDROCAD CALCULATIONS



Routing Diagram for Auburn E2 Existing Conditions_RJA
Prepared by Woodard & Curran, Inc, Printed 11/20/2024

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-Year	Type III 24-hr		Default	24.00	1	3.00	2
2	5-Year	Type III 24-hr		Default	24.00	1	3.70	2
3	10-Year	Type III 24-hr		Default	24.00	1	4.30	2
4	25-Year	Type III 24-hr		Default	24.00	1	5.40	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.306	69	50-75% Grass cover, Fair, HSG B (EWA-1, EWA-2)
0.163	84	50-75% Grass cover, Fair, HSG D (EWA-1, EWA-2)
0.301	56	Brush, Fair, HSG B (EWA-1, EWA-2)
0.357	77	Brush, Fair, HSG D (EWA-2)
0.660	58	Meadow, non-grazed, HSG B (EWA-1, EWA-2)
0.023	78	Meadow, non-grazed, HSG D (EWA-2)
0.011	98	Paved parking, HSG B (EWA-2)
0.326	98	Paved parking, HSG D (EWA-2)
0.078	98	Roofs, HSG B (EWA-1)
0.058	98	Unconnected roofs, HSG B (EWA-2)
0.172	98	Unconnected roofs, HSG D (EWA-1, EWA-2)
0.645	60	Woods, Fair, HSG B (EWA-1, EWA-2)
1.175	79	Woods, Fair, HSG D (EWA-1, EWA-2)
4.275	**73**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
2.059	HSG B	EWA-1, EWA-2
0.000	HSG C	
2.216	HSG D	EWA-1, EWA-2
0.000	Other	
4.275		**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	0.306	0.000	0.163	0.000	0.469	50-75% Grass cover, Fair	EWA-1, EWA-2
0.000	0.301	0.000	0.357	0.000	0.658	Brush, Fair	EWA-1, EWA-2
0.000	0.660	0.000	0.023	0.000	0.683	Meadow, non-grazed	EWA-1, EWA-2
0.000	0.011	0.000	0.326	0.000	0.337	Paved parking	EWA-2
0.000	0.078	0.000	0.000	0.000	0.078	Roofs	EWA-1
0.000	0.058	0.000	0.172	0.000	0.230	Unconnected roofs	EWA-1, EWA-2
0.000	0.645	0.000	1.175	0.000	1.820	Woods, Fair	EWA-1, EWA-2
0.000	**2.059**	**0.000**	**2.216**	**0.000**	**4.275**	**TOTAL AREA**	

Summary for Subcatchment EWA-1: EWA-1

Runoff = 1.08 cfs @ 12.25 hrs, Volume= 0.103 af, Depth> 0.77"
Routed to Link DP-1 : DP-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.00"

Area (ac)	CN	Description
0.078	98	Roofs, HSG B
0.244	69	50-75% Grass cover, Fair, HSG B
0.063	58	Meadow, non-grazed, HSG B
0.083	56	Brush, Fair, HSG B
0.354	60	Woods, Fair, HSG B
0.081	98	Unconnected roofs, HSG D
0.074	84	50-75% Grass cover, Fair, HSG D
0.627	79	Woods, Fair, HSG D
1.604	73	Weighted Average
1.445		90.09% Pervious Area
0.159		9.91% Impervious Area
0.081		50.94% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	100	0.0880	0.20		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
0.7	103	0.2340	2.42		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.7	123	0.0310	1.23		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
5.5	105	0.0040	0.32		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
16.0	431	Total			

Summary for Subcatchment EWA-2: EWA-2

Runoff = 1.66 cfs @ 12.30 hrs, Volume= 0.172 af, Depth> 0.77"
Routed to Pond ED-1 : EXISTING DRAINAGE DITCH

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.00"

Area (ac)	CN	Description
0.011	98	Paved parking, HSG B
0.058	98	Unconnected roofs, HSG B
0.062	69	50-75% Grass cover, Fair, HSG B
0.218	56	Brush, Fair, HSG B
0.597	58	Meadow, non-grazed, HSG B
0.291	60	Woods, Fair, HSG B
0.326	98	Paved parking, HSG D
0.091	98	Unconnected roofs, HSG D
0.089	84	50-75% Grass cover, Fair, HSG D
0.357	77	Brush, Fair, HSG D
0.023	78	Meadow, non-grazed, HSG D
0.548	79	Woods, Fair, HSG D
2.671	73	Weighted Average
2.185		81.80% Pervious Area
0.486		18.20% Impervious Area
0.149		30.66% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.5	100	0.0840	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.00"
1.0	126	0.1880	2.17		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.7	213	0.0360	1.33		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.3	212	0.0240	1.08		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
19.5	651	Total			

Summary for Pond ED-1: EXISTING DRAINAGE DITCH

Inflow Area = 2.671 ac, 18.20% Impervious, Inflow Depth > 0.77" for 2-Year event
Inflow = 1.66 cfs @ 12.30 hrs, Volume= 0.172 af
Outflow = 1.66 cfs @ 12.30 hrs, Volume= 0.172 af, Atten= 0%, Lag= 0.2 min
Primary = 1.66 cfs @ 12.30 hrs, Volume= 0.172 af
Routed to Link DP-2 : DP-2
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Routed to Link DP-2 : DP-2
Tertiary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Routed to Link DP-2 : DP-2

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 252.08' @ 12.31 hrs Surf.Area= 55 sf Storage= 22 cf

Plug-Flow detention time= 0.4 min calculated for 0.171 af (100% of inflow)
Center-of-Mass det. time= 0.3 min (834.4 - 834.1)

Volume	Invert	Avail.Storage	Storage Description
#1	251.40'	15,186 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
251.40	20	0	0
252.00	41	18	18
253.00	212	127	145
254.00	550	381	526
255.00	1,071	811	1,336
256.00	5,591	3,331	4,667
257.00	15,446	10,519	15,186

Device	Routing	Invert	Outlet Devices
#1	Primary	251.40'	**32.0" Round Culvert** L= 55.0' CMP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 251.40' / 251.09' S= 0.0056 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 5.59 sf
#2	Secondary	256.75'	**4.0" x 4.0" Horiz. Orifice/Grate X 5.00 columns** X 4 rows C= 0.600 in 24.0" x 24.0" Grate (56% open area) Limited to weir flow at low heads
#3	Tertiary	256.95'	**55.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=1.66 cfs @ 12.30 hrs HW=252.08' (Free Discharge)
└**1=Culvert** (Barrel Controls 1.66 cfs @ 2.21 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=251.40' (Free Discharge)
└**2=Orifice/Grate** (Controls 0.00 cfs)

Tertiary OutFlow Max=0.00 cfs @ 5.00 hrs HW=251.40' (Free Discharge)
└**3=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Link DP-1: DP-1

Inflow Area = 1.604 ac, 9.91% Impervious, Inflow Depth > 0.77" for 2-Year event
Inflow = 1.08 cfs @ 12.25 hrs, Volume= 0.103 af
Primary = 1.08 cfs @ 12.25 hrs, Volume= 0.103 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Link DP-2: DP-2

Inflow Area = 2.671 ac, 18.20% Impervious, Inflow Depth > 0.77" for 2-Year event
Inflow = 1.66 cfs @ 12.30 hrs, Volume= 0.172 af
Primary = 1.66 cfs @ 12.30 hrs, Volume= 0.172 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Subcatchment EWA-1: EWA-1

Runoff = 1.74 cfs @ 12.24 hrs, Volume= 0.160 af, Depth> 1.20"
Routed to Link DP-1 : DP-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 5-Year Rainfall=3.70"

Area (ac)	CN	Description
0.078	98	Roofs, HSG B
0.244	69	50-75% Grass cover, Fair, HSG B
0.063	58	Meadow, non-grazed, HSG B
0.083	56	Brush, Fair, HSG B
0.354	60	Woods, Fair, HSG B
0.081	98	Unconnected roofs, HSG D
0.074	84	50-75% Grass cover, Fair, HSG D
0.627	79	Woods, Fair, HSG D
1.604	73	Weighted Average
1.445		90.09% Pervious Area
0.159		9.91% Impervious Area
0.081		50.94% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	100	0.0880	0.20		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
0.7	103	0.2340	2.42		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.7	123	0.0310	1.23		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
5.5	105	0.0040	0.32		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
16.0	431	Total			

Summary for Subcatchment EWA-2: EWA-2

Runoff = 2.68 cfs @ 12.29 hrs, Volume= 0.267 af, Depth> 1.20"
Routed to Pond ED-1 : EXISTING DRAINAGE DITCH

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 5-Year Rainfall=3.70"

Area (ac)	CN	Description
0.011	98	Paved parking, HSG B
0.058	98	Unconnected roofs, HSG B
0.062	69	50-75% Grass cover, Fair, HSG B
0.218	56	Brush, Fair, HSG B
0.597	58	Meadow, non-grazed, HSG B
0.291	60	Woods, Fair, HSG B
0.326	98	Paved parking, HSG D
0.091	98	Unconnected roofs, HSG D
0.089	84	50-75% Grass cover, Fair, HSG D
0.357	77	Brush, Fair, HSG D
0.023	78	Meadow, non-grazed, HSG D
0.548	79	Woods, Fair, HSG D
2.671	73	Weighted Average
2.185		81.80% Pervious Area
0.486		18.20% Impervious Area
0.149		30.66% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.5	100	0.0840	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.00"
1.0	126	0.1880	2.17		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.7	213	0.0360	1.33		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.3	212	0.0240	1.08		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
19.5	651	Total			

Summary for Pond ED-1: EXISTING DRAINAGE DITCH

Inflow Area = 2.671 ac, 18.20% Impervious, Inflow Depth > 1.20" for 5-Year event
Inflow = 2.68 cfs @ 12.29 hrs, Volume= 0.267 af
Outflow = 2.67 cfs @ 12.29 hrs, Volume= 0.267 af, Atten= 0%, Lag= 0.3 min
Primary = 2.67 cfs @ 12.29 hrs, Volume= 0.267 af
Routed to Link DP-2 : DP-2
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Routed to Link DP-2 : DP-2
Tertiary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Routed to Link DP-2 : DP-2

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 252.26' @ 12.29 hrs Surf.Area= 86 sf Storage= 35 cf

Plug-Flow detention time= 0.4 min calculated for 0.267 af (100% of inflow)
Center-of-Mass det. time= 0.2 min (824.6 - 824.3)

Volume	Invert	Avail.Storage	Storage Description
#1	251.40'	15,186 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
251.40	20	0	0
252.00	41	18	18
253.00	212	127	145
254.00	550	381	526
255.00	1,071	811	1,336
256.00	5,591	3,331	4,667
257.00	15,446	10,519	15,186

Device	Routing	Invert	Outlet Devices
#1	Primary	251.40'	**32.0" Round Culvert** L= 55.0' CMP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 251.40' / 251.09' S= 0.0056 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 5.59 sf
#2	Secondary	256.75'	**4.0" x 4.0" Horiz. Orifice/Grate X 5.00 columns** X 4 rows C= 0.600 in 24.0" x 24.0" Grate (56% open area) Limited to weir flow at low heads
#3	Tertiary	256.95'	**55.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=2.66 cfs @ 12.29 hrs HW=252.26' (Free Discharge)
└**1=Culvert** (Barrel Controls 2.66 cfs @ 2.56 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=251.40' (Free Discharge)
└**2=Orifice/Grate** (Controls 0.00 cfs)

Tertiary OutFlow Max=0.00 cfs @ 5.00 hrs HW=251.40' (Free Discharge)
└**3=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Link DP-1: DP-1

Inflow Area = 1.604 ac, 9.91% Impervious, Inflow Depth > 1.20" for 5-Year event
Inflow = 1.74 cfs @ 12.24 hrs, Volume= 0.160 af
Primary = 1.74 cfs @ 12.24 hrs, Volume= 0.160 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Link DP-2: DP-2

Inflow Area = 2.671 ac, 18.20% Impervious, Inflow Depth > 1.20" for 5-Year event
Inflow = 2.67 cfs @ 12.29 hrs, Volume= 0.267 af
Primary = 2.67 cfs @ 12.29 hrs, Volume= 0.267 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Subcatchment EWA-1: EWA-1

Runoff = 2.35 cfs @ 12.23 hrs, Volume= 0.214 af, Depth> 1.60"
Routed to Link DP-1 : DP-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.30"

Area (ac)	CN	Description
0.078	98	Roofs, HSG B
0.244	69	50-75% Grass cover, Fair, HSG B
0.063	58	Meadow, non-grazed, HSG B
0.083	56	Brush, Fair, HSG B
0.354	60	Woods, Fair, HSG B
0.081	98	Unconnected roofs, HSG D
0.074	84	50-75% Grass cover, Fair, HSG D
0.627	79	Woods, Fair, HSG D
1.604	73	Weighted Average
1.445		90.09% Pervious Area
0.159		9.91% Impervious Area
0.081		50.94% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	100	0.0880	0.20		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
0.7	103	0.2340	2.42		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.7	123	0.0310	1.23		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
5.5	105	0.0040	0.32		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
16.0	431	Total			

Summary for Subcatchment EWA-2: EWA-2

Runoff = 3.62 cfs @ 12.28 hrs, Volume= 0.356 af, Depth> 1.60"
Routed to Pond ED-1 : EXISTING DRAINAGE DITCH

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.30"

Area (ac)	CN	Description
0.011	98	Paved parking, HSG B
0.058	98	Unconnected roofs, HSG B
0.062	69	50-75% Grass cover, Fair, HSG B
0.218	56	Brush, Fair, HSG B
0.597	58	Meadow, non-grazed, HSG B
0.291	60	Woods, Fair, HSG B
0.326	98	Paved parking, HSG D
0.091	98	Unconnected roofs, HSG D
0.089	84	50-75% Grass cover, Fair, HSG D
0.357	77	Brush, Fair, HSG D
0.023	78	Meadow, non-grazed, HSG D
0.548	79	Woods, Fair, HSG D
2.671	73	Weighted Average
2.185		81.80% Pervious Area
0.486		18.20% Impervious Area
0.149		30.66% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.5	100	0.0840	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.00"
1.0	126	0.1880	2.17		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.7	213	0.0360	1.33		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.3	212	0.0240	1.08		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
19.5	651	Total			

Summary for Pond ED-1: EXISTING DRAINAGE DITCH

Inflow Area = 2.671 ac, 18.20% Impervious, Inflow Depth > 1.60" for 10-Year event
Inflow = 3.62 cfs @ 12.28 hrs, Volume= 0.356 af
Outflow = 3.62 cfs @ 12.29 hrs, Volume= 0.356 af, Atten= 0%, Lag= 0.3 min
Primary = 3.62 cfs @ 12.29 hrs, Volume= 0.356 af
Routed to Link DP-2 : DP-2
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Routed to Link DP-2 : DP-2
Tertiary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Routed to Link DP-2 : DP-2

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 252.40' @ 12.29 hrs Surf.Area= 109 sf Storage= 48 cf

Plug-Flow detention time= 0.4 min calculated for 0.356 af (100% of inflow)
Center-of-Mass det. time= 0.2 min (818.2 - 818.0)

Volume	Invert	Avail.Storage	Storage Description
#1	251.40'	15,186 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
251.40	20	0	0
252.00	41	18	18
253.00	212	127	145
254.00	550	381	526
255.00	1,071	811	1,336
256.00	5,591	3,331	4,667
257.00	15,446	10,519	15,186

Device	Routing	Invert	Outlet Devices
#1	Primary	251.40'	**32.0" Round Culvert** L= 55.0' CMP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 251.40' / 251.09' S= 0.0056 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 5.59 sf
#2	Secondary	256.75'	**4.0" x 4.0" Horiz. Orifice/Grate X 5.00 columns** X 4 rows C= 0.600 in 24.0" x 24.0" Grate (56% open area) Limited to weir flow at low heads
#3	Tertiary	256.95'	**55.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=3.59 cfs @ 12.29 hrs HW=252.40' (Free Discharge)
└**1=Culvert** (Barrel Controls 3.59 cfs @ 2.80 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=251.40' (Free Discharge)
└**2=Orifice/Grate** (Controls 0.00 cfs)

Tertiary OutFlow Max=0.00 cfs @ 5.00 hrs HW=251.40' (Free Discharge)
└**3=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Link DP-1: DP-1

Inflow Area = 1.604 ac, 9.91% Impervious, Inflow Depth > 1.60" for 10-Year event
Inflow = 2.35 cfs @ 12.23 hrs, Volume= 0.214 af
Primary = 2.35 cfs @ 12.23 hrs, Volume= 0.214 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Link DP-2: DP-2

Inflow Area = 2.671 ac, 18.20% Impervious, Inflow Depth > 1.60" for 10-Year event
Inflow = 3.62 cfs @ 12.29 hrs, Volume= 0.356 af
Primary = 3.62 cfs @ 12.29 hrs, Volume= 0.356 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Subcatchment EWA-1: EWA-1

Runoff = 3.56 cfs @ 12.23 hrs, Volume= 0.321 af, Depth> 2.40"
Routed to Link DP-1 : DP-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.40"

Area (ac)	CN	Description
0.078	98	Roofs, HSG B
0.244	69	50-75% Grass cover, Fair, HSG B
0.063	58	Meadow, non-grazed, HSG B
0.083	56	Brush, Fair, HSG B
0.354	60	Woods, Fair, HSG B
0.081	98	Unconnected roofs, HSG D
0.074	84	50-75% Grass cover, Fair, HSG D
0.627	79	Woods, Fair, HSG D
1.604	73	Weighted Average
1.445		90.09% Pervious Area
0.159		9.91% Impervious Area
0.081		50.94% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	100	0.0880	0.20		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
0.7	103	0.2340	2.42		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.7	123	0.0310	1.23		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
5.5	105	0.0040	0.32		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
16.0	431	Total			

Summary for Subcatchment EWA-2: EWA-2

Runoff = 5.48 cfs @ 12.28 hrs, Volume= 0.534 af, Depth> 2.40"
Routed to Pond ED-1 : EXISTING DRAINAGE DITCH

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.40"

Area (ac)	CN	Description
0.011	98	Paved parking, HSG B
0.058	98	Unconnected roofs, HSG B
0.062	69	50-75% Grass cover, Fair, HSG B
0.218	56	Brush, Fair, HSG B
0.597	58	Meadow, non-grazed, HSG B
0.291	60	Woods, Fair, HSG B
0.326	98	Paved parking, HSG D
0.091	98	Unconnected roofs, HSG D
0.089	84	50-75% Grass cover, Fair, HSG D
0.357	77	Brush, Fair, HSG D
0.023	78	Meadow, non-grazed, HSG D
0.548	79	Woods, Fair, HSG D
2.671	73	Weighted Average
2.185		81.80% Pervious Area
0.486		18.20% Impervious Area
0.149		30.66% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.5	100	0.0840	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.00"
1.0	126	0.1880	2.17		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.7	213	0.0360	1.33		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
3.3	212	0.0240	1.08		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
19.5	651	Total			

Summary for Pond ED-1: EXISTING DRAINAGE DITCH

Inflow Area = 2.671 ac, 18.20% Impervious, Inflow Depth > 2.40" for 25-Year event
Inflow = 5.48 cfs @ 12.28 hrs, Volume= 0.534 af
Outflow = 5.47 cfs @ 12.28 hrs, Volume= 0.533 af, Atten= 0%, Lag= 0.4 min
Primary = 5.47 cfs @ 12.28 hrs, Volume= 0.533 af
Routed to Link DP-2 : DP-2
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Routed to Link DP-2 : DP-2
Tertiary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Routed to Link DP-2 : DP-2

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 252.63' @ 12.28 hrs Surf.Area= 149 sf Storage= 79 cf

Plug-Flow detention time= 0.4 min calculated for 0.533 af (100% of inflow)
Center-of-Mass det. time= 0.2 min (809.3 - 809.1)

Volume	Invert	Avail.Storage	Storage Description
#1	251.40'	15,186 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
251.40	20	0	0
252.00	41	18	18
253.00	212	127	145
254.00	550	381	526
255.00	1,071	811	1,336
256.00	5,591	3,331	4,667
257.00	15,446	10,519	15,186

Device	Routing	Invert	Outlet Devices
#1	Primary	251.40'	**32.0" Round Culvert** L= 55.0' CMP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 251.40' / 251.09' S= 0.0056 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 5.59 sf
#2	Secondary	256.75'	**4.0" x 4.0" Horiz. Orifice/Grate X 5.00 columns** X 4 rows C= 0.600 in 24.0" x 24.0" Grate (56% open area) Limited to weir flow at low heads
#3	Tertiary	256.95'	**55.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=5.43 cfs @ 12.28 hrs HW=252.63' (Free Discharge)
└**1=Culvert** (Barrel Controls 5.43 cfs @ 3.17 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=251.40' (Free Discharge)
└**2=Orifice/Grate** (Controls 0.00 cfs)

Tertiary OutFlow Max=0.00 cfs @ 5.00 hrs HW=251.40' (Free Discharge)
└**3=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Link DP-1: DP-1

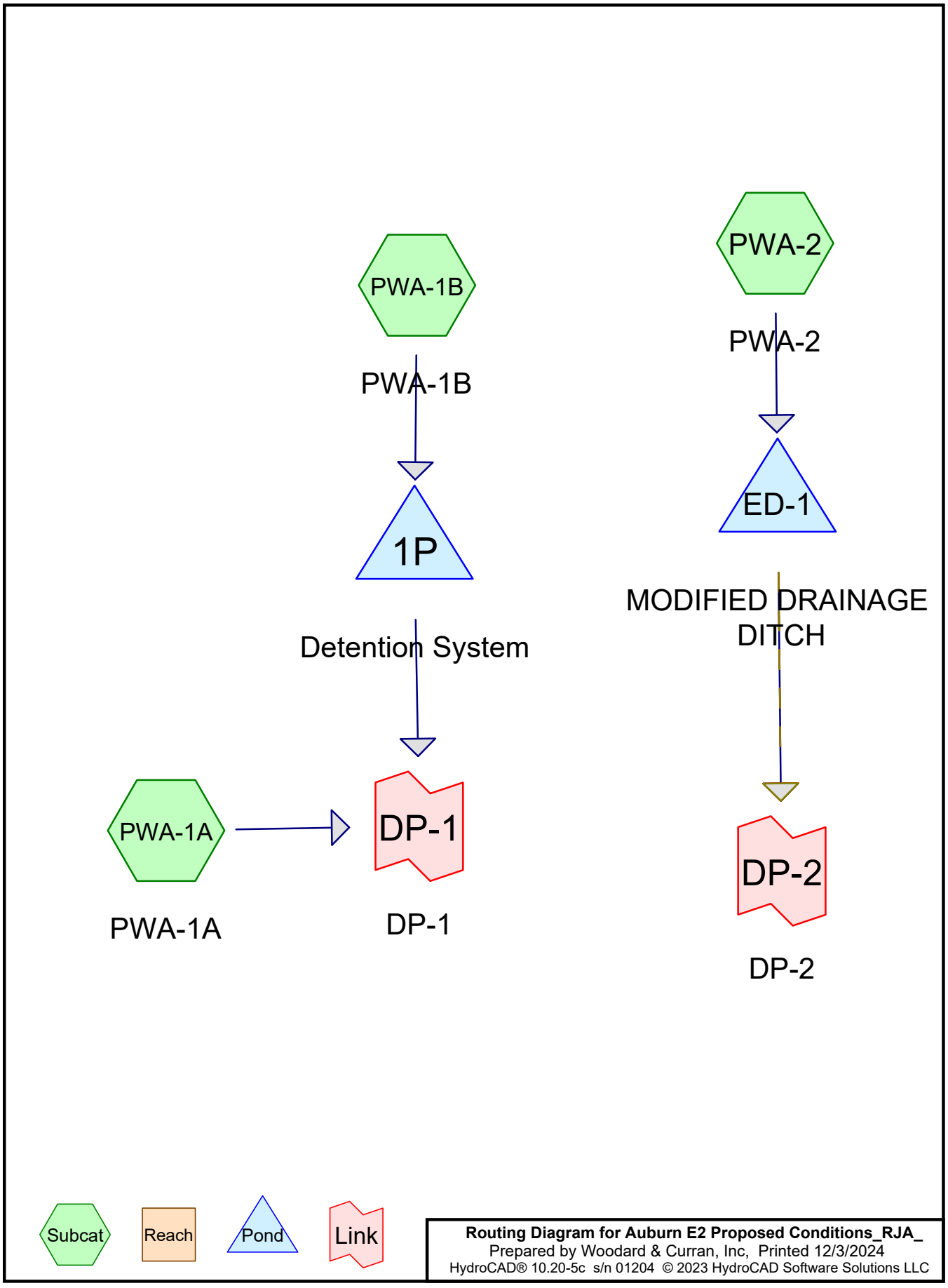
Inflow Area = 1.604 ac, 9.91% Impervious, Inflow Depth > 2.40" for 25-Year event
Inflow = 3.56 cfs @ 12.23 hrs, Volume= 0.321 af
Primary = 3.56 cfs @ 12.23 hrs, Volume= 0.321 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Link DP-2: DP-2

Inflow Area = 2.671 ac, 18.20% Impervious, Inflow Depth > 2.40" for 25-Year event
Inflow = 5.47 cfs @ 12.28 hrs, Volume= 0.533 af
Primary = 5.47 cfs @ 12.28 hrs, Volume= 0.533 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs



Routing Diagram for Auburn E2 Proposed Conditions_RJA_
Prepared by Woodard & Curran, Inc, Printed 12/3/2024

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.479	69	50-75% Grass cover, Fair, HSG B (PWA-1A, PWA-1B, PWA-2)
0.212	84	50-75% Grass cover, Fair, HSG D (PWA-1A, PWA-2)
0.214	56	Brush, Fair, HSG B (PWA-1A, PWA-2)
0.283	77	Brush, Fair, HSG D (PWA-2)
0.025	96	Gravel surface, HSG B (PWA-1A, PWA-2)
0.006	96	Gravel surface, HSG D (PWA-1A, PWA-2)
0.235	58	Meadow, non-grazed, HSG B (PWA-1A, PWA-2)
0.267	98	Paved parking, HSG B (PWA-1B, PWA-2)
0.327	98	Paved parking, HSG D (PWA-1B, PWA-2)
0.246	98	Unconnected roofs, HSG B (PWA-1A, PWA-1B, PWA-2)
0.215	98	Unconnected roofs, HSG D (PWA-1A, PWA-1B, PWA-2)
0.595	60	Woods, Fair, HSG B (PWA-1A, PWA-2)
1.175	79	Woods, Fair, HSG D (PWA-1A, PWA-2)
4.279	**78**	**TOTAL AREA**

Summary for Subcatchment PWA-1A: PWA-1A

Runoff = 1.01 cfs @ 12.25 hrs, Volume= 0.107 af, Depth= 0.86"
Routed to Link DP-1 : DP-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Adj	Description
2,081	98		Unconnected roofs, HSG B
13,042	69		50-75% Grass cover, Fair, HSG B
940	58		Meadow, non-grazed, HSG B
1,275	56		Brush, Fair, HSG B
13,166	60		Woods, Fair, HSG B
3,526	98		Unconnected roofs, HSG D
3,597	84		50-75% Grass cover, Fair, HSG D
27,316	79		Woods, Fair, HSG D
460	96		Gravel surface, HSG B
103	96		Gravel surface, HSG D
65,506	74	73	Weighted Average, UI Adjusted
59,899			91.44% Pervious Area
5,607			8.56% Impervious Area
5,607			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	100	0.0880	0.20		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
0.7	103	0.2340	2.42		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.7	123	0.0310	1.23		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
5.5	105	0.0040	0.32		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
16.0	431	Total			

Summary for Subcatchment PWA-1B: PWA-1B

Runoff = 1.25 cfs @ 12.09 hrs, Volume= 0.094 af, Depth= 2.25"
Routed to Pond 1P : Detention System

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
3,994	98	Unconnected roofs, HSG B
3,437	69	50-75% Grass cover, Fair, HSG B
11,073	98	Paved parking, HSG B
105	98	Unconnected roofs, HSG D
3,130	98	Paved parking, HSG D
21,739	93	Weighted Average
3,437		15.81% Pervious Area
18,302		84.19% Impervious Area
4,099		22.40% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PWA-2: PWA-2

Runoff = 1.60 cfs @ 12.31 hrs, Volume= 0.182 af, Depth= 0.96"
Routed to Pond ED-1 : MODIFIED DRAINAGE DITCH

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Adj	Description
567	98		Paved parking, HSG B
4,630	98		Unconnected roofs, HSG B
4,366	69		50-75% Grass cover, Fair, HSG B
8,044	56		Brush, Fair, HSG B
9,309	58		Meadow, non-grazed, HSG B
12,736	60		Woods, Fair, HSG B
11,099	98		Paved parking, HSG D
5,731	98		Unconnected roofs, HSG D
5,659	84		50-75% Grass cover, Fair, HSG D
12,326	77		Brush, Fair, HSG D
23,886	79		Woods, Fair, HSG D
634	96		Gravel surface, HSG B
166	96		Gravel surface, HSG D
99,153	77	75	Weighted Average, UI Adjusted
77,126			77.78% Pervious Area
22,027			22.22% Impervious Area
10,361			47.04% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.5	100	0.0840	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.00"
1.0	126	0.1880	2.17		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.4	48	0.0870	2.06		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.4	136	0.0180	0.94		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
4.4	277	0.0220	1.04		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
20.7	687	Total			

Summary for Pond 1P: Detention System

Inflow Area = 0.499 ac, 84.19% Impervious, Inflow Depth = 2.25" for 2-Year event
Inflow = 1.25 cfs @ 12.09 hrs, Volume= 0.094 af
Outflow = 0.03 cfs @ 17.06 hrs, Volume= 0.059 af, Atten= 98%, Lag= 298.3 min
Primary = 0.03 cfs @ 17.06 hrs, Volume= 0.059 af
Routed to Link DP-1 : DP-1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 255.1654' @ 17.06 hrs Surf.Area= 0.054 ac Storage= 0.071 af

Plug-Flow detention time= 893.9 min calculated for 0.059 af (63% of inflow)
Center-of-Mass det. time= 795.3 min (1,590.2 - 794.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	253.4700'	0.041 af	**34.75'W x 67.82'L x 3.25'H Field A** 0.176 af Overall - 0.074 af Embedded = 0.102 af x 40.0% Voids
#2A	253.4700'	0.074 af	**ADS_StormTech SC-800 +Cap** x 63 Inside #1 Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap 63 Chambers in 7 Rows Cap Storage= 3.4 cf x 2 x 7 rows = 47.9 cf
		0.115 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	253.4700'	**12.0" Round Culvert** L= 13.5' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 253.4700' / 253.3300' S= 0.0104 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Primary	256.2500'	**5.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.2000 0.4000 0.6000 0.8000 1.0000 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#3	Device 1	256.7000'	**5.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#4	Primary	253.4700'	**Asymmetrical Weir, C= 3.27** Offset (feet) 0.0000 0.1000 0.1000 0.1042 0.1042 0.2100 Height (feet) 3.23 3.23 0.00 0.00 3.23 3.23

Primary OutFlow Max=0.03 cfs @ 17.06 hrs HW=255.1654' TW=0.0000' (Dynamic Tailwater)
- **1=Culvert** (Passes 0.00 cfs of 4.13 cfs potential flow)
  - **3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)
- **2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
- **4=Asymmetrical Weir** (Weir Controls 0.03 cfs @ 4.26 fps)

Pond 1P: Detention System - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-800 +Cap (ADS StormTech®SC-800 with cap volume)
Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf
Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap
Cap Storage= 3.4 cf x 2 x 7 rows = 47.9 cf

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

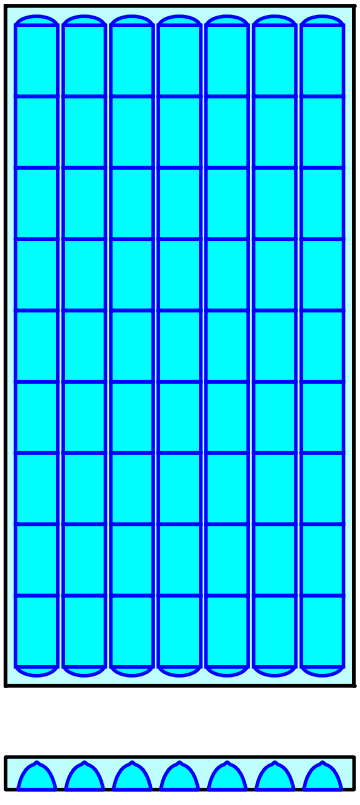
9 Chambers/Row x 7.12' Long +0.88' Cap Length x 2 = 65.82' Row Length +12.0" End Stone x 2 = 67.82' Base Length
7 Rows x 51.0" Wide + 6.0" Spacing x 6 + 12.0" Side Stone x 2 = 34.75' Base Width
33.0" Chamber Height + 6.0" Stone Cover = 3.25' Field Height

63 Chambers x 50.6 cf + 3.4 cf Cap Volume x 2 x 7 Rows = 3,235.2 cf Chamber Storage

7,659.0 cf Field - 3,235.2 cf Chambers = 4,423.9 cf Stone x 40.0% Voids = 1,769.5 cf Stone Storage

Chamber Storage + Stone Storage = 5,004.7 cf = 0.115 af
Overall Storage Efficiency = 65.3%
Overall System Size = 67.82' x 34.75' x 3.25'

63 Chambers
283.7 cy Field
163.8 cy Stone



Summary for Pond ED-1: MODIFIED DRAINAGE DITCH

Inflow Area = 2.276 ac, 22.22% Impervious, Inflow Depth = 0.96" for 2-Year event
Inflow = 1.60 cfs @ 12.31 hrs, Volume= 0.182 af
Outflow = 1.60 cfs @ 12.32 hrs, Volume= 0.182 af, Atten= 0%, Lag= 0.2 min
Primary = 1.60 cfs @ 12.32 hrs, Volume= 0.182 af
Routed to Link DP-2 : DP-2
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link DP-2 : DP-2
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link DP-2 : DP-2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 252.0693' @ 12.32 hrs Surf.Area= 53 sf Storage= 22 cf

Plug-Flow detention time= 0.5 min calculated for 0.182 af (100% of inflow)
Center-of-Mass det. time= 0.5 min (877.0 - 876.5)

Volume	Invert	Avail.Storage	Storage Description
#1	251.4000'	13,498 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
251.4000	20	0	0
252.0000	41	18	18
253.0000	212	127	145
254.0000	550	381	526
255.0000	1,071	811	1,336
256.0000	5,565	3,318	4,654
257.0000	12,122	8,844	13,498

Device	Routing	Invert	Outlet Devices
#1	Primary	251.4000'	**32.0" Round Culvert** L= 55.0' CMP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 251.4000' / 251.0900' S= 0.0056 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 5.59 sf
#2	Secondary	256.7500'	**4.0" x 4.0" Horiz. Orifice/Grate X 5.00 columns** X 4 rows C= 0.600 in 24.0" x 24.0" Grate (56% open area) Limited to weir flow at low heads
#3	Tertiary	256.9500'	**55.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.2000 0.4000 0.6000 0.8000 1.0000 1.2000 1.4000 1.6000 1.8000 2.0000 2.5000 3.0000 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=1.59 cfs @ 12.32 hrs HW=252.0671' TW=0.0000' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 1.59 cfs @ 2.19 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=251.4000' TW=0.0000' (Dynamic Tailwater)
↑—**2=Orifice/Grate** (Controls 0.00 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=251.4000' TW=0.0000' (Dynamic Tailwater)
↑—**3=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Link DP-1: DP-1

Inflow Area = 2.003 ac, 27.40% Impervious, Inflow Depth > 1.00" for 2-Year event
Inflow = 1.03 cfs @ 12.25 hrs, Volume= 0.167 af
Primary = 1.03 cfs @ 12.25 hrs, Volume= 0.167 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link DP-2: DP-2

Inflow Area = 2.276 ac, 22.22% Impervious, Inflow Depth = 0.96" for 2-Year event
Inflow = 1.60 cfs @ 12.32 hrs, Volume= 0.182 af
Primary = 1.60 cfs @ 12.32 hrs, Volume= 0.182 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Subcatchment PWA-1A: PWA-1A

Runoff = 1.63 cfs @ 12.24 hrs, Volume= 0.165 af, Depth= 1.32"
Routed to Link DP-1 : DP-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 5-Year Rainfall=3.70"

Area (sf)	CN	Adj	Description
2,081	98		Unconnected roofs, HSG B
13,042	69		50-75% Grass cover, Fair, HSG B
940	58		Meadow, non-grazed, HSG B
1,275	56		Brush, Fair, HSG B
13,166	60		Woods, Fair, HSG B
3,526	98		Unconnected roofs, HSG D
3,597	84		50-75% Grass cover, Fair, HSG D
27,316	79		Woods, Fair, HSG D
460	96		Gravel surface, HSG B
103	96		Gravel surface, HSG D
65,506	74	73	Weighted Average, UI Adjusted
59,899			91.44% Pervious Area
5,607			8.56% Impervious Area
5,607			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	100	0.0880	0.20		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
0.7	103	0.2340	2.42		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.7	123	0.0310	1.23		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
5.5	105	0.0040	0.32		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
16.0	431	Total			

Summary for Subcatchment PWA-1B: PWA-1B

Runoff = 1.61 cfs @ 12.09 hrs, Volume= 0.122 af, Depth= 2.93"
Routed to Pond 1P : Detention System

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 5-Year Rainfall=3.70"

Area (sf)	CN	Description
3,994	98	Unconnected roofs, HSG B
3,437	69	50-75% Grass cover, Fair, HSG B
11,073	98	Paved parking, HSG B
105	98	Unconnected roofs, HSG D
3,130	98	Paved parking, HSG D
21,739	93	Weighted Average
3,437		15.81% Pervious Area
18,302		84.19% Impervious Area
4,099		22.40% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PWA-2: PWA-2

Runoff = 2.49 cfs @ 12.30 hrs, Volume= 0.274 af, Depth= 1.45"
Routed to Pond ED-1 : MODIFIED DRAINAGE DITCH

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 5-Year Rainfall=3.70"

Area (sf)	CN	Adj	Description
567	98		Paved parking, HSG B
4,630	98		Unconnected roofs, HSG B
4,366	69		50-75% Grass cover, Fair, HSG B
8,044	56		Brush, Fair, HSG B
9,309	58		Meadow, non-grazed, HSG B
12,736	60		Woods, Fair, HSG B
11,099	98		Paved parking, HSG D
5,731	98		Unconnected roofs, HSG D
5,659	84		50-75% Grass cover, Fair, HSG D
12,326	77		Brush, Fair, HSG D
23,886	79		Woods, Fair, HSG D
634	96		Gravel surface, HSG B
166	96		Gravel surface, HSG D
99,153	77	75	Weighted Average, UI Adjusted
77,126			77.78% Pervious Area
22,027			22.22% Impervious Area
10,361			47.04% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.5	100	0.0840	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.00"
1.0	126	0.1880	2.17		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.4	48	0.0870	2.06		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.4	136	0.0180	0.94		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
4.4	277	0.0220	1.04		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
20.7	687	Total			

Summary for Pond 1P: Detention System

Inflow Area = 0.499 ac, 84.19% Impervious, Inflow Depth = 2.93" for 5-Year event
Inflow = 1.61 cfs @ 12.09 hrs, Volume= 0.122 af
Outflow = 0.05 cfs @ 16.15 hrs, Volume= 0.083 af, Atten= 97%, Lag= 243.7 min
Primary = 0.05 cfs @ 16.15 hrs, Volume= 0.083 af
Routed to Link DP-1 : DP-1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 255.7133' @ 16.15 hrs Surf.Area= 0.054 ac Storage= 0.091 af

Plug-Flow detention time= 850.7 min calculated for 0.083 af (68% of inflow)
Center-of-Mass det. time= 757.5 min (1,545.3 - 787.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	253.4700'	0.041 af	**34.75'W x 67.82'L x 3.25'H Field A** 0.176 af Overall - 0.074 af Embedded = 0.102 af x 40.0% Voids
#2A	253.4700'	0.074 af	**ADS_StormTech SC-800 +Cap** x 63 Inside #1 Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap 63 Chambers in 7 Rows Cap Storage= 3.4 cf x 2 x 7 rows = 47.9 cf
		0.115 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	253.4700'	**12.0" Round Culvert** L= 13.5' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 253.4700' / 253.3300' S= 0.0104 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Primary	256.2500'	**5.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.2000 0.4000 0.6000 0.8000 1.0000 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#3	Device 1	256.7000'	**5.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#4	Primary	253.4700'	**Asymmetrical Weir, C= 3.27** Offset (feet) 0.0000 0.1000 0.1000 0.1042 0.1042 0.2100 Height (feet) 3.23 3.23 0.00 0.00 3.23 3.23

Primary OutFlow Max=0.05 cfs @ 16.15 hrs HW=255.7133' TW=0.0000' (Dynamic Tailwater)
- **1=Culvert** (Passes 0.00 cfs of 4.99 cfs potential flow)
  - **3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)
- **2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
- **4=Asymmetrical Weir** (Weir Controls 0.05 cfs @ 4.90 fps)

Pond 1P: Detention System - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-800 +Cap (ADS StormTech®SC-800 with cap volume)
Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf
Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap
Cap Storage= 3.4 cf x 2 x 7 rows = 47.9 cf

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

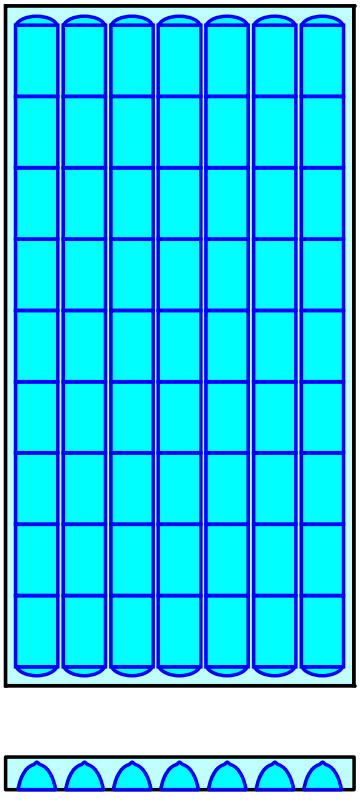
9 Chambers/Row x 7.12' Long +0.88' Cap Length x 2 = 65.82' Row Length +12.0" End Stone x 2 = 67.82' Base Length
7 Rows x 51.0" Wide + 6.0" Spacing x 6 + 12.0" Side Stone x 2 = 34.75' Base Width
33.0" Chamber Height + 6.0" Stone Cover = 3.25' Field Height

63 Chambers x 50.6 cf + 3.4 cf Cap Volume x 2 x 7 Rows = 3,235.2 cf Chamber Storage

7,659.0 cf Field - 3,235.2 cf Chambers = 4,423.9 cf Stone x 40.0% Voids = 1,769.5 cf Stone Storage

Chamber Storage + Stone Storage = 5,004.7 cf = 0.115 af
Overall Storage Efficiency = 65.3%
Overall System Size = 67.82' x 34.75' x 3.25'

63 Chambers
283.7 cy Field
163.8 cy Stone



Summary for Pond ED-1: MODIFIED DRAINAGE DITCH

Inflow Area = 2.276 ac, 22.22% Impervious, Inflow Depth = 1.45" for 5-Year event
Inflow = 2.49 cfs @ 12.30 hrs, Volume= 0.274 af
Outflow = 2.49 cfs @ 12.31 hrs, Volume= 0.274 af, Atten= 0%, Lag= 0.2 min
Primary = 2.49 cfs @ 12.31 hrs, Volume= 0.274 af
Routed to Link DP-2 : DP-2
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link DP-2 : DP-2
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link DP-2 : DP-2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 252.2304' @ 12.31 hrs Surf.Area= 80 sf Storage= 32 cf

Plug-Flow detention time= 0.4 min calculated for 0.274 af (100% of inflow)
Center-of-Mass det. time= 0.4 min (864.4 - 864.0)

Volume	Invert	Avail.Storage	Storage Description
#1	251.4000'	13,498 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
251.4000	20	0	0
252.0000	41	18	18
253.0000	212	127	145
254.0000	550	381	526
255.0000	1,071	811	1,336
256.0000	5,565	3,318	4,654
257.0000	12,122	8,844	13,498

Device	Routing	Invert	Outlet Devices
#1	Primary	251.4000'	**32.0" Round Culvert** L= 55.0' CMP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 251.4000' / 251.0900' S= 0.0056 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 5.59 sf
#2	Secondary	256.7500'	**4.0" x 4.0" Horiz. Orifice/Grate X 5.00 columns** X 4 rows C= 0.600 in 24.0" x 24.0" Grate (56% open area) Limited to weir flow at low heads
#3	Tertiary	256.9500'	**55.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.2000 0.4000 0.6000 0.8000 1.0000 1.2000 1.4000 1.6000 1.8000 2.0000 2.5000 3.0000 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=2.48 cfs @ 12.31 hrs HW=252.2289' TW=0.0000' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 2.48 cfs @ 2.50 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=251.4000' TW=0.0000' (Dynamic Tailwater)
↑—**2=Orifice/Grate** (Controls 0.00 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=251.4000' TW=0.0000' (Dynamic Tailwater)
↑—**3=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Link DP-1: DP-1

Inflow Area = 2.003 ac, 27.40% Impervious, Inflow Depth > 1.48" for 5-Year event
Inflow = 1.65 cfs @ 12.24 hrs, Volume= 0.248 af
Primary = 1.65 cfs @ 12.24 hrs, Volume= 0.248 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link DP-2: DP-2

Inflow Area = 2.276 ac, 22.22% Impervious, Inflow Depth = 1.45" for 5-Year event
Inflow = 2.49 cfs @ 12.31 hrs, Volume= 0.274 af
Primary = 2.49 cfs @ 12.31 hrs, Volume= 0.274 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Subcatchment PWA-1A: PWA-1A

Runoff = 2.20 cfs @ 12.23 hrs, Volume= 0.219 af, Depth= 1.75"
Routed to Link DP-1 : DP-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.30"

Area (sf)	CN	Adj	Description
2,081	98		Unconnected roofs, HSG B
13,042	69		50-75% Grass cover, Fair, HSG B
940	58		Meadow, non-grazed, HSG B
1,275	56		Brush, Fair, HSG B
13,166	60		Woods, Fair, HSG B
3,526	98		Unconnected roofs, HSG D
3,597	84		50-75% Grass cover, Fair, HSG D
27,316	79		Woods, Fair, HSG D
460	96		Gravel surface, HSG B
103	96		Gravel surface, HSG D
65,506	74	73	Weighted Average, UI Adjusted
59,899			91.44% Pervious Area
5,607			8.56% Impervious Area
5,607			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	100	0.0880	0.20		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
0.7	103	0.2340	2.42		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.7	123	0.0310	1.23		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
5.5	105	0.0040	0.32		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
16.0	431	Total			

Summary for Subcatchment PWA-1B: PWA-1B

Runoff = 1.91 cfs @ 12.09 hrs, Volume= 0.146 af, Depth= 3.51"
Routed to Pond 1P : Detention System

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.30"

Area (sf)	CN	Description
3,994	98	Unconnected roofs, HSG B
3,437	69	50-75% Grass cover, Fair, HSG B
11,073	98	Paved parking, HSG B
105	98	Unconnected roofs, HSG D
3,130	98	Paved parking, HSG D
21,739	93	Weighted Average
3,437		15.81% Pervious Area
18,302		84.19% Impervious Area
4,099		22.40% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PWA-2: PWA-2

Runoff = 3.31 cfs @ 12.30 hrs, Volume= 0.359 af, Depth= 1.89"
Routed to Pond ED-1 : MODIFIED DRAINAGE DITCH

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.30"

Area (sf)	CN	Adj	Description
567	98		Paved parking, HSG B
4,630	98		Unconnected roofs, HSG B
4,366	69		50-75% Grass cover, Fair, HSG B
8,044	56		Brush, Fair, HSG B
9,309	58		Meadow, non-grazed, HSG B
12,736	60		Woods, Fair, HSG B
11,099	98		Paved parking, HSG D
5,731	98		Unconnected roofs, HSG D
5,659	84		50-75% Grass cover, Fair, HSG D
12,326	77		Brush, Fair, HSG D
23,886	79		Woods, Fair, HSG D
634	96		Gravel surface, HSG B
166	96		Gravel surface, HSG D
99,153	77	75	Weighted Average, UI Adjusted
77,126			77.78% Pervious Area
22,027			22.22% Impervious Area
10,361			47.04% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.5	100	0.0840	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.00"
1.0	126	0.1880	2.17		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.4	48	0.0870	2.06		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.4	136	0.0180	0.94		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
4.4	277	0.0220	1.04		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
20.7	687	Total			

Summary for Pond 1P: Detention System

Inflow Area = 0.499 ac, 84.19% Impervious, Inflow Depth = 3.51" for 10-Year event
Inflow = 1.91 cfs @ 12.09 hrs, Volume= 0.146 af
Outflow = 0.09 cfs @ 14.81 hrs, Volume= 0.104 af, Atten= 96%, Lag= 163.1 min
Primary = 0.09 cfs @ 14.81 hrs, Volume= 0.104 af
Routed to Link DP-1 : DP-1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 256.2633' @ 14.81 hrs Surf.Area= 0.054 ac Storage= 0.105 af

Plug-Flow detention time= 798.8 min calculated for 0.104 af (71% of inflow)
Center-of-Mass det. time= 710.1 min (1,493.0 - 782.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	253.4700'	0.041 af	**34.75'W x 67.82'L x 3.25'H Field A** 0.176 af Overall - 0.074 af Embedded = 0.102 af x 40.0% Voids
#2A	253.4700'	0.074 af	**ADS_StormTech SC-800 +Cap** x 63 Inside #1 Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap 63 Chambers in 7 Rows Cap Storage= 3.4 cf x 2 x 7 rows = 47.9 cf
		0.115 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	253.4700'	**12.0" Round Culvert** L= 13.5' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 253.4700' / 253.3300' S= 0.0104 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Primary	256.2500'	**5.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.2000 0.4000 0.6000 0.8000 1.0000 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#3	Device 1	256.7000'	**5.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#4	Primary	253.4700'	**Asymmetrical Weir, C= 3.27** Offset (feet) 0.0000 0.1000 0.1000 0.1042 0.1042 0.2100 Height (feet) 3.23 3.23 0.00 0.00 3.23 3.23

Primary OutFlow Max=0.09 cfs @ 14.81 hrs HW=256.2633' TW=0.0000' (Dynamic Tailwater)
- **1=Culvert** (Passes 0.00 cfs of 5.73 cfs potential flow)
  - **3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)
- **2=Broad-Crested Rectangular Weir** (Weir Controls 0.02 cfs @ 0.32 fps)
- **4=Asymmetrical Weir** (Weir Controls 0.06 cfs @ 5.47 fps)

Pond 1P: Detention System - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-800 +Cap (ADS StormTech®SC-800 with cap volume)
Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf
Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap
Cap Storage= 3.4 cf x 2 x 7 rows = 47.9 cf

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

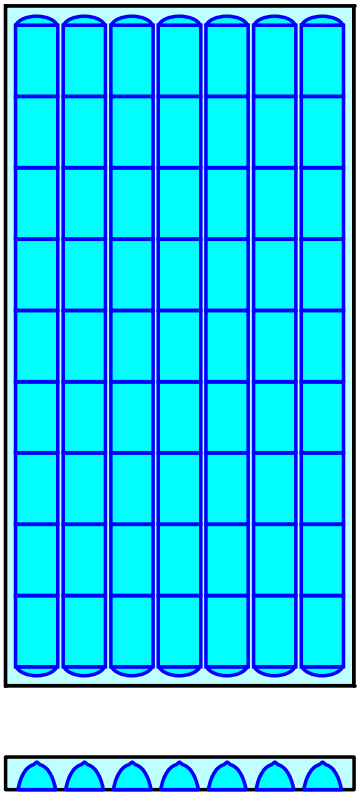
9 Chambers/Row x 7.12' Long +0.88' Cap Length x 2 = 65.82' Row Length +12.0" End Stone x 2 = 67.82' Base Length
7 Rows x 51.0" Wide + 6.0" Spacing x 6 + 12.0" Side Stone x 2 = 34.75' Base Width
33.0" Chamber Height + 6.0" Stone Cover = 3.25' Field Height

63 Chambers x 50.6 cf + 3.4 cf Cap Volume x 2 x 7 Rows = 3,235.2 cf Chamber Storage

7,659.0 cf Field - 3,235.2 cf Chambers = 4,423.9 cf Stone x 40.0% Voids = 1,769.5 cf Stone Storage

Chamber Storage + Stone Storage = 5,004.7 cf = 0.115 af
Overall Storage Efficiency = 65.3%
Overall System Size = 67.82' x 34.75' x 3.25'

63 Chambers
283.7 cy Field
163.8 cy Stone



Summary for Pond ED-1: MODIFIED DRAINAGE DITCH

Inflow Area = 2.276 ac, 22.22% Impervious, Inflow Depth = 1.89" for 10-Year event
Inflow = 3.31 cfs @ 12.30 hrs, Volume= 0.359 af
Outflow = 3.31 cfs @ 12.30 hrs, Volume= 0.359 af, Atten= 0%, Lag= 0.2 min
Primary = 3.31 cfs @ 12.30 hrs, Volume= 0.359 af
Routed to Link DP-2 : DP-2
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link DP-2 : DP-2
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link DP-2 : DP-2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 252.3564' @ 12.30 hrs Surf.Area= 102 sf Storage= 44 cf

Plug-Flow detention time= 1.1 min calculated for 0.359 af (100% of inflow)
Center-of-Mass det. time= 0.4 min (856.4 - 856.0)

Volume	Invert	Avail.Storage	Storage Description
#1	251.4000'	13,498 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
251.4000	20	0	0
252.0000	41	18	18
253.0000	212	127	145
254.0000	550	381	526
255.0000	1,071	811	1,336
256.0000	5,565	3,318	4,654
257.0000	12,122	8,844	13,498

Device	Routing	Invert	Outlet Devices
#1	Primary	251.4000'	**32.0" Round Culvert** L= 55.0' CMP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 251.4000' / 251.0900' S= 0.0056 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 5.59 sf
#2	Secondary	256.7500'	**4.0" x 4.0" Horiz. Orifice/Grate X 5.00 columns** X 4 rows C= 0.600 in 24.0" x 24.0" Grate (56% open area) Limited to weir flow at low heads
#3	Tertiary	256.9500'	**55.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.2000 0.4000 0.6000 0.8000 1.0000 1.2000 1.4000 1.6000 1.8000 2.0000 2.5000 3.0000 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=3.30 cfs @ 12.30 hrs HW=252.3557' TW=0.0000' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 3.30 cfs @ 2.73 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=251.4000' TW=0.0000' (Dynamic Tailwater)
↑—**2=Orifice/Grate** (Controls 0.00 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=251.4000' TW=0.0000' (Dynamic Tailwater)
↑—**3=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Link DP-1: DP-1

Inflow Area = 2.003 ac, 27.40% Impervious, Inflow Depth > 1.94" for 10-Year event
Inflow = 2.24 cfs @ 12.23 hrs, Volume= 0.323 af
Primary = 2.24 cfs @ 12.23 hrs, Volume= 0.323 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link DP-2: DP-2

Inflow Area = 2.276 ac, 22.22% Impervious, Inflow Depth = 1.89" for 10-Year event
Inflow = 3.31 cfs @ 12.30 hrs, Volume= 0.359 af
Primary = 3.31 cfs @ 12.30 hrs, Volume= 0.359 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Subcatchment PWA-1A: PWA-1A

Runoff = 3.33 cfs @ 12.23 hrs, Volume= 0.326 af, Depth= 2.60"
Routed to Link DP-1 : DP-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.40"

Area (sf)	CN	Adj	Description
2,081	98		Unconnected roofs, HSG B
13,042	69		50-75% Grass cover, Fair, HSG B
940	58		Meadow, non-grazed, HSG B
1,275	56		Brush, Fair, HSG B
13,166	60		Woods, Fair, HSG B
3,526	98		Unconnected roofs, HSG D
3,597	84		50-75% Grass cover, Fair, HSG D
27,316	79		Woods, Fair, HSG D
460	96		Gravel surface, HSG B
103	96		Gravel surface, HSG D
65,506	74	73	Weighted Average, UI Adjusted
59,899			91.44% Pervious Area
5,607			8.56% Impervious Area
5,607			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	100	0.0880	0.20		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
0.7	103	0.2340	2.42		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.7	123	0.0310	1.23		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
5.5	105	0.0040	0.32		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
16.0	431	Total			

Summary for Subcatchment PWA-1B: PWA-1B

Runoff = 2.45 cfs @ 12.09 hrs, Volume= 0.191 af, Depth= 4.59"
Routed to Pond 1P : Detention System

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.40"

Area (sf)	CN	Description
3,994	98	Unconnected roofs, HSG B
3,437	69	50-75% Grass cover, Fair, HSG B
11,073	98	Paved parking, HSG B
105	98	Unconnected roofs, HSG D
3,130	98	Paved parking, HSG D
21,739	93	Weighted Average
3,437		15.81% Pervious Area
18,302		84.19% Impervious Area
4,099		22.40% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PWA-2: PWA-2

Runoff = 4.90 cfs @ 12.29 hrs, Volume= 0.527 af, Depth= 2.78"
Routed to Pond ED-1 : MODIFIED DRAINAGE DITCH

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.40"

Area (sf)	CN	Adj	Description
567	98		Paved parking, HSG B
4,630	98		Unconnected roofs, HSG B
4,366	69		50-75% Grass cover, Fair, HSG B
8,044	56		Brush, Fair, HSG B
9,309	58		Meadow, non-grazed, HSG B
12,736	60		Woods, Fair, HSG B
11,099	98		Paved parking, HSG D
5,731	98		Unconnected roofs, HSG D
5,659	84		50-75% Grass cover, Fair, HSG D
12,326	77		Brush, Fair, HSG D
23,886	79		Woods, Fair, HSG D
634	96		Gravel surface, HSG B
166	96		Gravel surface, HSG D
99,153	77	75	Weighted Average, UI Adjusted
77,126			77.78% Pervious Area
22,027			22.22% Impervious Area
10,361			47.04% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.5	100	0.0840	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.00"
1.0	126	0.1880	2.17		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.4	48	0.0870	2.06		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.4	136	0.0180	0.94		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
4.4	277	0.0220	1.04		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
20.7	687	Total			

Summary for Pond 1P: Detention System

Inflow Area = 0.499 ac, 84.19% Impervious, Inflow Depth = 4.59" for 25-Year event
Inflow = 2.45 cfs @ 12.09 hrs, Volume= 0.191 af
Outflow = 0.82 cfs @ 12.39 hrs, Volume= 0.148 af, Atten= 67%, Lag= 17.9 min
Primary = 0.82 cfs @ 12.39 hrs, Volume= 0.148 af
Routed to Link DP-1 : DP-1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 256.3922' @ 12.39 hrs Surf.Area= 0.054 ac Storage= 0.108 af

Plug-Flow detention time= 610.4 min calculated for 0.148 af (78% of inflow)
Center-of-Mass det. time= 531.9 min (1,307.9 - 776.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	253.4700'	0.041 af	**34.75'W x 67.82'L x 3.25'H Field A** 0.176 af Overall - 0.074 af Embedded = 0.102 af x 40.0% Voids
#2A	253.4700'	0.074 af	**ADS_StormTech SC-800 +Cap** x 63 Inside #1 Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap 63 Chambers in 7 Rows Cap Storage= 3.4 cf x 2 x 7 rows = 47.9 cf
		0.115 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	253.4700'	**12.0" Round Culvert** L= 13.5' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 253.4700' / 253.3300' S= 0.0104 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Primary	256.2500'	**5.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.2000 0.4000 0.6000 0.8000 1.0000 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#3	Device 1	256.7000'	**5.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#4	Primary	253.4700'	**Asymmetrical Weir, C= 3.27** Offset (feet) 0.0000 0.1000 0.1000 0.1042 0.1042 0.2100 Height (feet) 3.23 3.23 0.00 0.00 3.23 3.23

Primary OutFlow Max=0.81 cfs @ 12.39 hrs HW=256.3906' TW=0.0000' (Dynamic Tailwater)
- **1=Culvert** (Passes 0.00 cfs of 5.88 cfs potential flow)
  - **3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)
- **2=Broad-Crested Rectangular Weir** (Weir Controls 0.74 cfs @ 1.05 fps)
- **4=Asymmetrical Weir** (Weir Controls 0.07 cfs @ 5.59 fps)

Pond 1P: Detention System - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-800 +Cap (ADS StormTech®SC-800 with cap volume)
Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf
Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap
Cap Storage= 3.4 cf x 2 x 7 rows = 47.9 cf

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

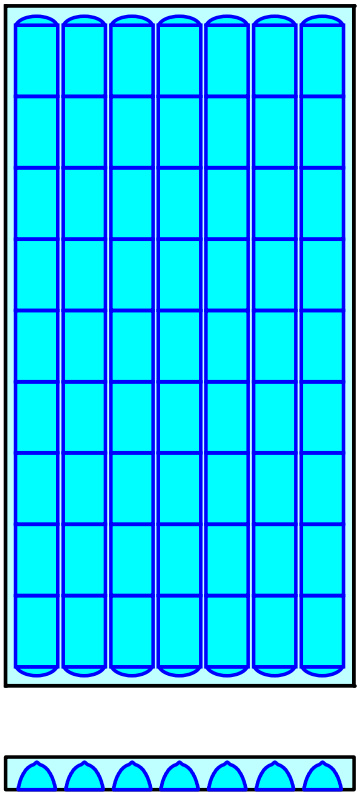
9 Chambers/Row x 7.12' Long +0.88' Cap Length x 2 = 65.82' Row Length +12.0" End Stone x 2 = 67.82' Base Length
7 Rows x 51.0" Wide + 6.0" Spacing x 6 + 12.0" Side Stone x 2 = 34.75' Base Width
33.0" Chamber Height + 6.0" Stone Cover = 3.25' Field Height

63 Chambers x 50.6 cf + 3.4 cf Cap Volume x 2 x 7 Rows = 3,235.2 cf Chamber Storage

7,659.0 cf Field - 3,235.2 cf Chambers = 4,423.9 cf Stone x 40.0% Voids = 1,769.5 cf Stone Storage

Chamber Storage + Stone Storage = 5,004.7 cf = 0.115 af
Overall Storage Efficiency = 65.3%
Overall System Size = 67.82' x 34.75' x 3.25'

63 Chambers
283.7 cy Field
163.8 cy Stone



Summary for Pond ED-1: MODIFIED DRAINAGE DITCH

Inflow Area = 2.276 ac, 22.22% Impervious, Inflow Depth = 2.78" for 25-Year event
Inflow = 4.90 cfs @ 12.29 hrs, Volume= 0.527 af
Outflow = 4.90 cfs @ 12.30 hrs, Volume= 0.527 af, Atten= 0%, Lag= 0.3 min
Primary = 4.90 cfs @ 12.30 hrs, Volume= 0.527 af
Routed to Link DP-2 : DP-2
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link DP-2 : DP-2
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link DP-2 : DP-2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 252.5664' @ 12.30 hrs Surf.Area= 138 sf Storage= 69 cf

Plug-Flow detention time= 1.1 min calculated for 0.527 af (100% of inflow)
Center-of-Mass det. time= 0.3 min (845.2 - 844.9)

Volume	Invert	Avail.Storage	Storage Description
#1	251.4000'	13,498 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
251.4000	20	0	0
252.0000	41	18	18
253.0000	212	127	145
254.0000	550	381	526
255.0000	1,071	811	1,336
256.0000	5,565	3,318	4,654
257.0000	12,122	8,844	13,498

Device	Routing	Invert	Outlet Devices
#1	Primary	251.4000'	**32.0" Round Culvert** L= 55.0' CMP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 251.4000' / 251.0900' S= 0.0056 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 5.59 sf
#2	Secondary	256.7500'	**4.0" x 4.0" Horiz. Orifice/Grate X 5.00 columns** X 4 rows C= 0.600 in 24.0" x 24.0" Grate (56% open area) Limited to weir flow at low heads
#3	Tertiary	256.9500'	**55.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.2000 0.4000 0.6000 0.8000 1.0000 1.2000 1.4000 1.6000 1.8000 2.0000 2.5000 3.0000 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=4.89 cfs @ 12.30 hrs HW=252.5653' TW=0.0000' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 4.89 cfs @ 3.07 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=251.4000' TW=0.0000' (Dynamic Tailwater)
↑—**2=Orifice/Grate** (Controls 0.00 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=251.4000' TW=0.0000' (Dynamic Tailwater)
↑—**3=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Link DP-1: DP-1

Inflow Area = 2.003 ac, 27.40% Impervious, Inflow Depth > 2.84" for 25-Year event
Inflow = 3.51 cfs @ 12.35 hrs, Volume= 0.474 af
Primary = 3.51 cfs @ 12.35 hrs, Volume= 0.474 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link DP-2: DP-2

Inflow Area = 2.276 ac, 22.22% Impervious, Inflow Depth = 2.78" for 25-Year event
Inflow = 4.90 cfs @ 12.30 hrs, Volume= 0.527 af
Primary = 4.90 cfs @ 12.30 hrs, Volume= 0.527 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Subcatchment PWA-1A: PWA-1A

Runoff = 4.63 cfs @ 12.22 hrs, Volume= 0.447 af, Depth= 3.57"
Routed to Link DP-1 : DP-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr Custom Rainfall=6.57"

Area (sf)	CN	Adj	Description
2,081	98		Unconnected roofs, HSG B
13,042	69		50-75% Grass cover, Fair, HSG B
940	58		Meadow, non-grazed, HSG B
1,275	56		Brush, Fair, HSG B
13,166	60		Woods, Fair, HSG B
3,526	98		Unconnected roofs, HSG D
3,597	84		50-75% Grass cover, Fair, HSG D
27,316	79		Woods, Fair, HSG D
460	96		Gravel surface, HSG B
103	96		Gravel surface, HSG D
65,506	74	73	Weighted Average, UI Adjusted
59,899			91.44% Pervious Area
5,607			8.56% Impervious Area
5,607			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	100	0.0880	0.20		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.00"
0.7	103	0.2340	2.42		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
1.7	123	0.0310	1.23		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
5.5	105	0.0040	0.32		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
16.0	431	Total			

Summary for Subcatchment PWA-1B: PWA-1B

Runoff = 3.03 cfs @ 12.09 hrs, Volume= 0.239 af, Depth= 5.75"
Routed to Pond 1P : Detention System

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr Custom Rainfall=6.57"

Area (sf)	CN	Description
3,994	98	Unconnected roofs, HSG B
3,437	69	50-75% Grass cover, Fair, HSG B
11,073	98	Paved parking, HSG B
105	98	Unconnected roofs, HSG D
3,130	98	Paved parking, HSG D
21,739	93	Weighted Average
3,437		15.81% Pervious Area
18,302		84.19% Impervious Area
4,099		22.40% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment PWA-2: PWA-2

Runoff = 6.67 cfs @ 12.29 hrs, Volume= 0.716 af, Depth= 3.77"
Routed to Pond ED-1 : MODIFIED DRAINAGE DITCH

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr Custom Rainfall=6.57"

Area (sf)	CN	Adj	Description
567	98		Paved parking, HSG B
4,630	98		Unconnected roofs, HSG B
4,366	69		50-75% Grass cover, Fair, HSG B
8,044	56		Brush, Fair, HSG B
9,309	58		Meadow, non-grazed, HSG B
12,736	60		Woods, Fair, HSG B
11,099	98		Paved parking, HSG D
5,731	98		Unconnected roofs, HSG D
5,659	84		50-75% Grass cover, Fair, HSG D
12,326	77		Brush, Fair, HSG D
23,886	79		Woods, Fair, HSG D
634	96		Gravel surface, HSG B
166	96		Gravel surface, HSG D
99,153	77	75	Weighted Average, UI Adjusted
77,126			77.78% Pervious Area
22,027			22.22% Impervious Area
10,361			47.04% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.5	100	0.0840	0.13		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.00"
1.0	126	0.1880	2.17		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.4	48	0.0870	2.06		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.4	136	0.0180	0.94		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
4.4	277	0.0220	1.04		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
20.7	687	Total			

Summary for Pond 1P: Detention System

Inflow Area = 0.499 ac, 84.19% Impervious, Inflow Depth = 5.75" for Custom event
Inflow = 3.03 cfs @ 12.09 hrs, Volume= 0.239 af
Outflow = 2.35 cfs @ 12.17 hrs, Volume= 0.195 af, Atten= 23%, Lag= 5.2 min
Primary = 2.35 cfs @ 12.17 hrs, Volume= 0.195 af
Routed to Link DP-1 : DP-1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 256.5604' @ 12.17 hrs Surf.Area= 0.054 ac Storage= 0.111 af

Plug-Flow detention time= 494.3 min calculated for 0.195 af (82% of inflow)
Center-of-Mass det. time= 422.6 min (1,193.0 - 770.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	253.4700'	0.041 af	**34.75'W x 67.82'L x 3.25'H Field A** 0.176 af Overall - 0.074 af Embedded = 0.102 af x 40.0% Voids
#2A	253.4700'	0.074 af	**ADS_StormTech SC-800 +Cap** x 63 Inside #1 Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap 63 Chambers in 7 Rows Cap Storage= 3.4 cf x 2 x 7 rows = 47.9 cf
		0.115 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	253.4700'	**12.0" Round Culvert** L= 13.5' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 253.4700' / 253.3300' S= 0.0104 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Primary	256.2500'	**5.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.2000 0.4000 0.6000 0.8000 1.0000 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#3	Device 1	256.7000'	**5.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#4	Primary	253.4700'	**Asymmetrical Weir, C= 3.27** Offset (feet) 0.0000 0.1000 0.1000 0.1042 0.1042 0.2100 Height (feet) 3.23 3.23 0.00 0.00 3.23 3.23

Primary OutFlow Max=2.09 cfs @ 12.17 hrs HW=256.5216' TW=0.0000' (Dynamic Tailwater)
- **1=Culvert** (Passes 0.00 cfs of 6.04 cfs potential flow)
  - **3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)
- **2=Broad-Crested Rectangular Weir** (Weir Controls 2.01 cfs @ 1.48 fps)
- **4=Asymmetrical Weir** (Weir Controls 0.07 cfs @ 5.71 fps)

Pond 1P: Detention System - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-800 +Cap (ADS StormTech®SC-800 with cap volume)
Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf
Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap
Cap Storage= 3.4 cf x 2 x 7 rows = 47.9 cf

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

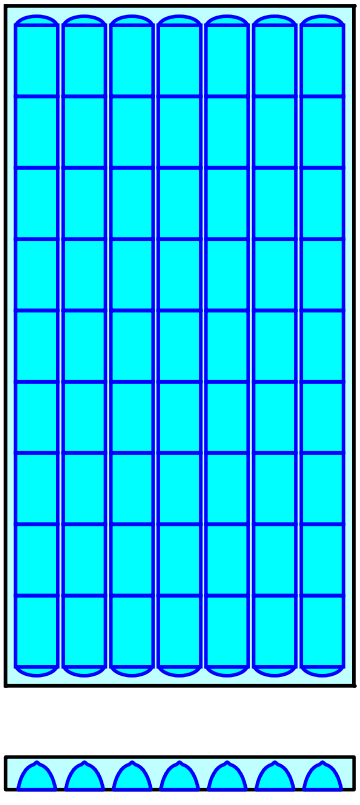
9 Chambers/Row x 7.12' Long +0.88' Cap Length x 2 = 65.82' Row Length +12.0" End Stone x 2 = 67.82' Base Length
7 Rows x 51.0" Wide + 6.0" Spacing x 6 + 12.0" Side Stone x 2 = 34.75' Base Width
33.0" Chamber Height + 6.0" Stone Cover = 3.25' Field Height

63 Chambers x 50.6 cf + 3.4 cf Cap Volume x 2 x 7 Rows = 3,235.2 cf Chamber Storage

7,659.0 cf Field - 3,235.2 cf Chambers = 4,423.9 cf Stone x 40.0% Voids = 1,769.5 cf Stone Storage

Chamber Storage + Stone Storage = 5,004.7 cf = 0.115 af
Overall Storage Efficiency = 65.3%
Overall System Size = 67.82' x 34.75' x 3.25'

63 Chambers
283.7 cy Field
163.8 cy Stone



Summary for Pond ED-1: MODIFIED DRAINAGE DITCH

Inflow Area = 2.276 ac, 22.22% Impervious, Inflow Depth = 3.77" for Custom event
Inflow = 6.67 cfs @ 12.29 hrs, Volume= 0.716 af
Outflow = 6.67 cfs @ 12.29 hrs, Volume= 0.716 af, Atten= 0%, Lag= 0.3 min
Primary = 6.67 cfs @ 12.29 hrs, Volume= 0.716 af
Routed to Link DP-2 : DP-2
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link DP-2 : DP-2
Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link DP-2 : DP-2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 252.7686' @ 12.29 hrs Surf.Area= 172 sf Storage= 100 cf

Plug-Flow detention time= 0.3 min calculated for 0.715 af (100% of inflow)
Center-of-Mass det. time= 0.3 min (836.4 - 836.1)

Volume	Invert	Avail.Storage	Storage Description
#1	251.4000'	13,498 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
251.4000	20	0	0
252.0000	41	18	18
253.0000	212	127	145
254.0000	550	381	526
255.0000	1,071	811	1,336
256.0000	5,565	3,318	4,654
257.0000	12,122	8,844	13,498

Device	Routing	Invert	Outlet Devices
#1	Primary	251.4000'	**32.0" Round Culvert** L= 55.0' CMP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 251.4000' / 251.0900' S= 0.0056 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 5.59 sf
#2	Secondary	256.7500'	**4.0" x 4.0" Horiz. Orifice/Grate X 5.00 columns** X 4 rows C= 0.600 in 24.0" x 24.0" Grate (56% open area) Limited to weir flow at low heads
#3	Tertiary	256.9500'	**55.0' long x 1.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.2000 0.4000 0.6000 0.8000 1.0000 1.2000 1.4000 1.6000 1.8000 2.0000 2.5000 3.0000 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32

Primary OutFlow Max=6.65 cfs @ 12.29 hrs HW=252.7659' TW=0.0000' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 6.65 cfs @ 3.36 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=251.4000' TW=0.0000' (Dynamic Tailwater)
↑—**2=Orifice/Grate** (Controls 0.00 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=251.4000' TW=0.0000' (Dynamic Tailwater)
↑—**3=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Link DP-1: DP-1

Inflow Area = 2.003 ac, 27.40% Impervious, Inflow Depth > 3.85" for Custom event
Inflow = 6.63 cfs @ 12.20 hrs, Volume= 0.642 af
Primary = 6.63 cfs @ 12.20 hrs, Volume= 0.642 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link DP-2: DP-2

Inflow Area = 2.276 ac, 22.22% Impervious, Inflow Depth = 3.77" for Custom event
Inflow = 6.67 cfs @ 12.29 hrs, Volume= 0.716 af
Primary = 6.67 cfs @ 12.29 hrs, Volume= 0.716 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

APPENDIX H. 24-hour duration rainfalls for various return periods

COUNTY	Storm Type	1-YR	2-YR	5-YR	10-YR	25-YR	50-YR	100-YR	500-YR
ANDROSCOGGIN	III	2.5	3.0	3.7	4.3	5.4	6.4	7.6	11.1
AROOSTOOK C (Presque Isle Area)	II	1.9	2.3	2.8	3.2	3.9	4.6	5.3	7.6
AROOSTOOK N (Fort Kent Area)	II	1.9	2.2	2.7	3.1	3.7	4.3	5.0	7.0
AROOSTOOK S (Houlton Area)	II	2.1	2.5	3.0	3.4	4.1	4.7	5.4	7.5
CUMBERLAND NW (Bridgton Area)	III	2.5	3.0	3.7	4.3	5.4	6.3	7.5	10.9
CUMBERLAND SE (N Windham Area)	III	2.6	3.1	3.9	4.6	5.8	6.9	8.1	12.1
FRANKLIN	II	2.0	2.4	2.9	3.4	4.2	4.9	5.7	8.2
HANCOCK	III	2.5	2.9	3.6	4.2	5.2	6.1	7.2	10.5
KENNEBEC	III	2.4	2.8	3.5	4.2	5.2	6.1	7.2	10.6
KNOX	III	2.6	3.2	3.9	4.6	5.7	6.7	7.9	11.5
LINCOLN	III	2.5	3.1	3.8	4.5	5.5	6.5	7.6	11.1
OXFORD E (Rumford Area)	II[1]	2.3	2.7	3.3	3.9	4.8	5.7	6.7	9.7
OXFORD W (Gilead Area)	II	2.2	2.7	3.4	4.0	4.9	5.8	6.9	10.1
PENOBSCOT N (Millinocket Area)	II	2.2	2.6	3.2	3.8	4.7	5.6	6.5	9.5
PENOBSCOT S (Hudson Area)	II	2.3	2.7	3.4	3.9	4.9	5.7	6.7	9.7
PISCATAQUIS N (Chesuncook Area)	II	2.0	2.4	2.9	3.4	4.2	5.0	5.8	8.5
PISCATAQUIS S (Monson Area)	II	2.2	2.7	3.3	3.9	4.8	5.7	6.8	10.0
SAGADAHOC	III	2.6	3.2	3.9	4.6	5.7	6.7	7.8	11.4
SOMERSET N (Pittston Farm Area)	II	2.0	2.3	2.8	3.3	4.0	4.7	5.4	7.8
SOMERSET S (Solon Area)	II	2.3	2.7	3.4	3.9	4.9	5.7	6.7	9.8
WALDO	III	2.4	2.9	3.6	4.2	5.2	6.1	7.2	10.5
WASHINGTON	III	2.5	2.8	3.4	3.9	4.8	5.5	6.4	9.0
YORK	III	2.6	3.3	4.1	4.9	6.2	7.3	8.7	13.2

1 Use Type III rainfall for the towns of Brownfield, Buckfield, Denmark, Hartford, Hebron, Hiram, Oxford, and Porter.

Source: Data extracted by the Maine Department of Environmental Protection from the Northeast Regional Climate Center website (http://precip.eas.cornell.edu), Extreme Precipitation Tables. Data from this website was obtained from the National Oceanic and Atmospheric Administration's Regional Climate Center Program.
June 2014

Woodard & Curran

woodardcurran.com

ATTACHMENT 09: PROOF OF FINANCIAL CAPACITY

City of Auburn, Maine
Financial Services
60 Court Street | Auburn, Maine 04210
www.auburnmaine.gov | 207.333.6601

December 3, 2024

To whom it may concern,

The City of Auburn has the financial capacity to manage the Engine 2 Station Reconstruction project as a result of successful bonding in fiscal year 2025, and approved Capital Improvement Plan to bond the additional funds to complete the project in fiscal year 2026.

Sincerely,

Kelsey L. D. Earle
Finance Director, City of Auburn

ATTACHMENT 10: AWSD UTILITY CAPACITY CONFIRMATION

Robert Angelo

From: Mike Broadbent <mbroadbent@awsd.org>
Sent: Wednesday, December 4, 2024 12:44 PM
To: Robert Angelo; Matthew Waite; Greg Jalbert
Cc: Caitlin Suhr; Ross Tsantoulis; Julia Tate; Kenneth Coley; Dan Goyette; Kris Bennett (Auburn)
Subject: RE: Auburn Engine 2 - Water and Sewer Capacity
Attachments: 0706.JPG

Thanks Robert, we have sufficient capacity to meet you request. Attached is the physical record for the water service at 180 S. Main Street. The District's water main was replaced in 2014 with 12" pipe. The sewer main was re-lined at the same time however we do not have a service record for the station.

Mike

From: Robert Angelo <RAngelo@woodardcurran.com>
Sent: Wednesday, December 4, 2024 12:27 PM
To: Matthew Waite <mwaite@awsd.org>; Greg Jalbert <gjalbert@awsd.org>; Mike Broadbent <mbroadbent@awsd.org>
Cc: Caitlin Suhr <CSuhr@woodardcurran.com>; Ross Tsantoulis <RTsantoulis@woodardcurran.com>; Julia Tate <julia@simonsarchitects.com>; Kenneth Coley <Kenneth.Coley@salasobrien.com>; Dan Goyette <dgoyette@auburnmaine.gov>; Kris Bennett (Auburn) <kbennett@auburnmaine.gov>
Subject: Auburn Engine 2 - Water and Sewer Capacity

Matt,

We're working with the City on the design for a new firestation at 180 S Main St and were hoping you could verify the existing watermain and sewer main have sufficient capacity for the proposed building's demand.

Peak estimated domestic water demand is 35 gpm without a truck fill. With a 2" truck fill at an assumed domestic water pressure of 60 psi, the peak demand could be as high as ≈ 330 gpm.
The estimated sewer discharge is ≈ 580 gallons per day.

Also – Please let us know if there are any record documents available for the existing sewer service to the existing Engine 2 station (180 S Maint St).
Let us know if you have any questions or need any additional information.

Thank you!

Robert Angelo, PE (MA)
Project Engineer

Woodard & Curran

978.852.9020 woodardcurran.com

ATTACHMENT 11: NATURAL RESOURCE DELINEATIONS MEMO

MEMORANDUM

TO: Caitlin Glass, Woodard & Curran

FROM: Elliott Boardman & Kevin Ryan, FBE

SUBJECT: **Auburn, Maine Wetland Delineation**

DATE: April 10, 2023

CC: Forrest Bell, FB Environmental Associates

Attachments: 1) Cowardin Wetland Classification System 2) Wetland Delineation Map; 3) Site Photographs; 4) Natural Resource Agency Correspondence; 4) Completed USACE Wetland Determination Data Forms

On March 31, 2023, FB Environmental Associates (FBE) delineated wetlands at the Engine 2 Fire Station in Auburn, Maine at the request of Woodard & Curran. The Survey Area is an approximately 2-acre parcel, located at 180 South Main Street.

Prior to the field investigation, FBE reviewed existing information relevant to wetlands on the site: aerial photographs, National Wetlands Inventory (NWI) maps, and soil maps. FBE also corresponded with the Maine Natural Areas Program (MNAP) regarding the presence of rare or unique botanical features, and the Maine Department of Inland Fisheries and Wildlife (MDIFW) to inquire about known locations of Endangered, Threatened, and Special Concern species; designated Essential and Significant Wildlife Habitats; and fisheries habitat concerns within the vicinity of the Survey Area.

WETLAND DELINEATION METHODOLOGY

Wetlands were identified and delineated in accordance with the 1987 US Army Corps of Engineers (USACE) Wetland Delineation Manual[1] using the methods described in the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region, Version 2.0. [2] (Copies of completed wetland determination data forms are available upon request.) All wetlands and watercourses were classified using the US Fish and Wildlife Service (USFWS) Classification of Wetlands and Deepwater Habitats of the United States. [3]

Wetland boundaries were marked in the field using pink flagging emblazoned with the words "WETLAND DELINEATION." Boundaries of wetlands delineated during the field survey were geo-located using a sub-meter accuracy GPS unit (EOS Arrow-100). The collected GPS data were used to create the attached wetland delineation map.

[1] Environmental Laboratory. (1987). Corps of Engineers Wetlands Delineation Manual. Wetlands Research Program Technical Report Y-87-1. Vicksburg, MS: US Army Engineer Waterways Experiment Station.

[2] U.S. Army Corps of Engineers. 2012. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (Version 2.0), ed. J. S. Wakeley, R. W. Lichvar, C. V. Noble, and J. F. Berkowitz. ERDC/EL TR-12-1. Vicksburg, MS: U.S. Army Engineer Research and Development Center.

[3] Cowardin, L. M., V. Carter, F. C. Golet, E. T. LaRoe. 1979. *Classification of wetlands and deepwater habitats of the United States*. U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C. 131pp.

WETLANDS OF SPECIAL SIGNIFICANCE

In Maine, Wetlands of Special Significance (WoSS) are regulated by the Maine Department of Environmental Protection under Chapter 310 of the Maine Natural Resources Protection Act. All coastal wetlands and great ponds (inland bodies of water >10 acres in size) are classified as WoSS. In addition, a freshwater wetland may be considered one of special significance if it: (1) contains a natural community that is critically imperiled or imperiled as defined by the Maine Natural Areas Program; (2) contains significant wildlife habitat; (3) is located within 250 feet of a coastal wetland; (4) is located within 250 feet of a great pond; (5) contains at least 20,000 square feet of aquatic vegetation, emergent marsh vegetation, or open water; (6) is inundated with floodwater during a 100-year flood event based on flood insurance maps; (7) is or contains peatlands; or (8) is located within 25 feet of a river, stream or brook. FBE assessed the Survey Area for the presence of WoSS.

RESULTS – NATURAL RESOURCE AGENCY CORRESPONDENCE

Reply correspondence to FBE's data inquiry letters to Maine natural resource agencies is attached to this memo.

Maine Natural Areas Program

MNAP correspondence states that according to the information currently in their Biological and Conservation Data System files, there are no rare botanical features documented specifically within the project area. Note however that the lack of data may indicate minimal survey efforts rather than confirm the absence of rare botanical features.

Maine Department of Inland Fisheries and Wildlife

MDIFW correspondence states that available information indicates that no locations of State-listed Endangered, Threatened, or Special Concern species within the project area would be affected by the project. MDIFW has not mapped any Essential or Significant Wildlife Habitats or inland fisheries habitats that would be directly affected by the project. Note that this review is only for known MDIFW jurisdictional features and should not be interpreted as a comprehensive review for the presence of other regulated features that may occur in this area.

RESULTS - GENERAL SITE DESCRIPTION

Fieldwork was conducted on 31 March 2023, by FBE's Ecological Services Lead and Senior Wetland Scientist Kevin Ryan and Wetland Scientist Elliott Boardman. The Survey Area is comprised of predominantly mowed field, most of which meets the criteria to be considered wetland. Small areas of scrub-shrub wetland are present along the northern and southern edges of the Survey Area. The northeastern portion of the Survey Area contains the fire station and its associated driveway.

Two wetlands and one ditch channel were identified and mapped within the Survey Area.

RESULTS - WETLANDS, WATERCOURSES, AND VERNAL POOLS

Wetland A

Wetland A comprises the majority of the Survey Area. The wetland has a seasonally flooded/saturated hydrologic regime and meets the classification of palustrine scrub-shrub/emergent marsh wetland (PSS1/PEM1E). The unmowed portion of the wetland complex, located along the south edge of the Survey Area contains scrub-shrub vegetation. The remainder of the wetland is maintained as field.

At the first USACE plot location, box elder (*Acer negundo*) is dominant in the canopy, with red-osier dogwood (*Cornus sericea*) and pussy willow (*Salix discolor*) dominant the shrub layer. Invasive purple loosestrife (*Lythrum salicaria*) is dominant in the herb stratum. Reed canary grass (*Phalaris arundinacea*) and sedges (*Carex* spp.) are also present.

Soils at the USACE plot location meet the criteria of A11 – *Depleted Below Dark Surface* and F3 – *Depleted Matrix* as the soil profile consists of a 2-inch layer of silt loam underlain by 14+ inches of depleted silty clay loam. The observed primary indicator of hydrology was A1 – *Surface Water*.

The remainder of Wetland A is mowed field that meets the criteria to be considered wetland. At USACE plot within this location, soft rush (*Juncus effusus*) and reed canary grass dominate the herb stratum. Soils at the plot location meet the criteria of A11 – *Depleted Below Dark Surface* and F3 – *Depleted Matrix* as the soil consists of 2-inches of silt loam underlain by 14+ inches of silty clay loam with prominent redoximorphic features. The observed primary indicators of hydrology were A1 – *Surface Water* and *A3 - Saturation*

Wetland A meets the technical criteria for being considered WoSS, with over 20,000 square feet of emergent vegetation present. However, it is important to note that much of the wetland is maintained as a field through seasonal mowing and is not a naturally occurring marsh.

To determine if Wetland A should be classified as a WoSS wetland, a field visit by the DEP may be required to assess the amount of emergent vegetation. If NRPA permitting is triggered by proposed activities at the site, a waiver to a lower tier may be warranted/necessary.

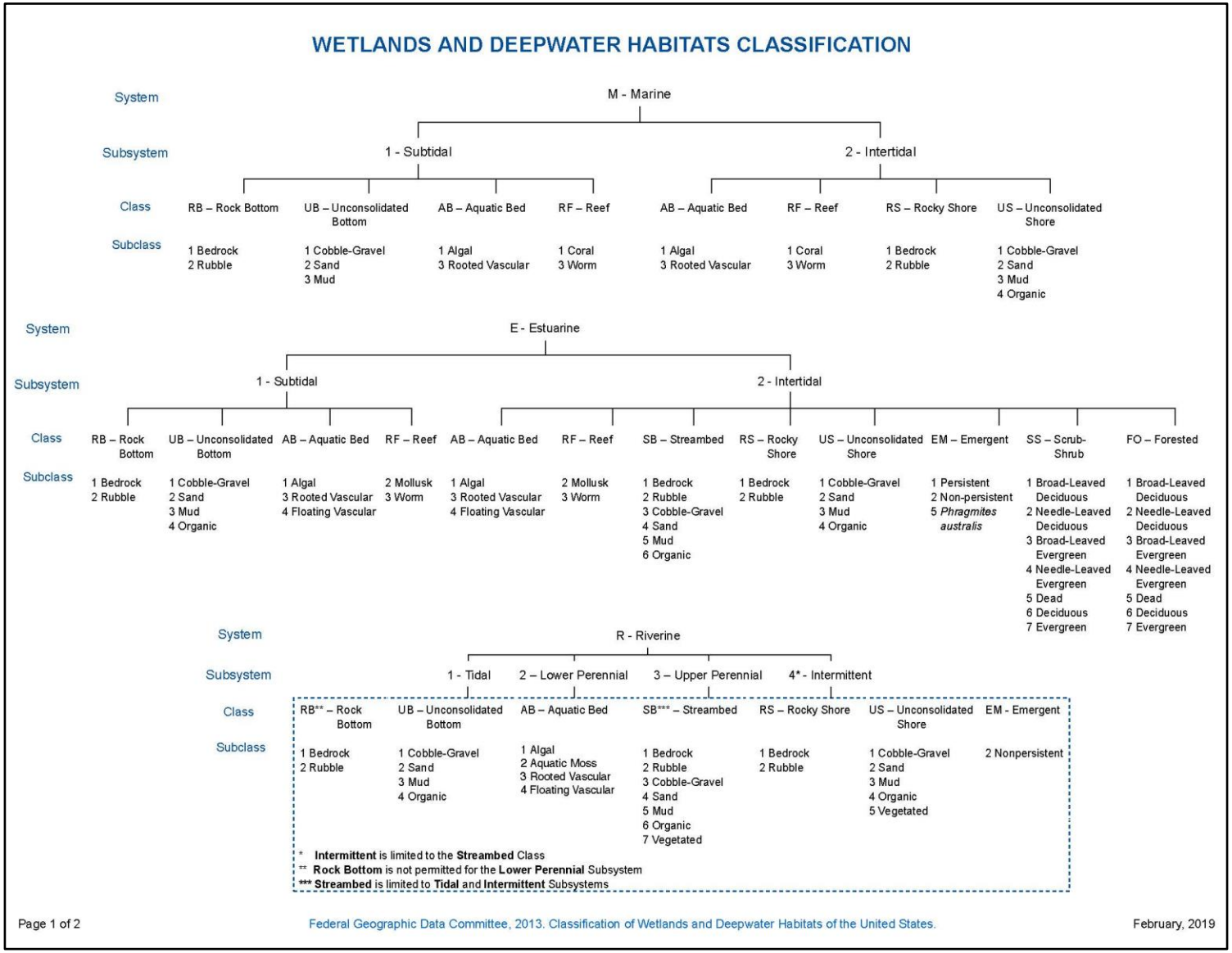
Wetland B

Wetland B encompasses a small area along the northwestern edge of the Survey Area. The wetland is seasonally flooded/saturated containing predominantly scrub-shrub vegetation with emergent vegetation present in mowed areas (PSS1/PEM1E). Purple loosestrife is dominant with nannyberry (*Viburnum lentago*) and small patches of sensitive fern (*Onoclea sensibilis*) present to a lesser extent.

Ditch 1

Ditch 1 is a linear ditch that runs parallel to the southern border of the Survey Area. Water flows west through the ditch and eventually meets a culvert running under the access road of an adjacent property.Water from the two culverts then flows north where it flows under South Main Street via a culvert and drains into a stream on the west side of South Main Street.

ATTACHMENT 1. COWARDIN WETLAND CLASSIFICATION SYSTEM



WETLANDS AND DEEPWATER HABITATS CLASSIFICATION

System: M - Marine

Subsystem: 1 - Subtidal; 2 - Intertidal

Class	Subclass (1 - Subtidal)	Subclass (2 - Intertidal)
RB – Rock Bottom	1 Bedrock 2 Rubble	
UB – Unconsolidated Bottom	1 Cobble-Gravel 2 Sand 3 Mud	
AB – Aquatic Bed	1 Algal 3 Rooted Vascular	1 Algal 3 Rooted Vascular
RF – Reef	1 Coral 3 Worm	1 Coral 3 Worm
RS – Rocky Shore		1 Bedrock 2 Rubble
US – Unconsolidated Shore		1 Cobble-Gravel 2 Sand 3 Mud 4 Organic

System: E - Estuarine

Subsystem: 1 - Subtidal; 2 - Intertidal

Class	Subclass (1 - Subtidal)	Subclass (2 - Intertidal)
RB – Rock Bottom	1 Bedrock 2 Rubble	
UB – Unconsolidated Bottom	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic	
AB – Aquatic Bed	1 Algal 3 Rooted Vascular 4 Floating Vascular	1 Algal 3 Rooted Vascular 4 Floating Vascular
RF – Reef	2 Mollusk 3 Worm	2 Mollusk 3 Worm
SB – Streambed		1 Bedrock 2 Rubble 3 Cobble-Gravel 4 Sand 5 Mud 6 Organic
RS – Rocky Shore		1 Bedrock 2 Rubble
US – Unconsolidated Shore		1 Cobble-Gravel 2 Sand 3 Mud 4 Organic
EM – Emergent		1 Persistent 2 Non-persistent 5 *Phragmites australis*
SS – Scrub-Shrub		1 Broad-Leaved Deciduous 2 Needle-Leaved Deciduous 3 Broad-Leaved Evergreen 4 Needle-Leaved Evergreen 5 Dead 6 Deciduous 7 Evergreen
FO – Forested		1 Broad-Leaved Deciduous 2 Needle-Leaved Deciduous 3 Broad-Leaved Evergreen 4 Needle-Leaved Evergreen 5 Dead 6 Deciduous 7 Evergreen

System: R - Riverine

Subsystem: 1 - Tidal; 2 – Lower Perennial; 3 – Upper Perennial; 4* - Intermittent

Class	Subclass
RB** – Rock Bottom	1 Bedrock 2 Rubble
UB – Unconsolidated Bottom	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic
AB – Aquatic Bed	1 Algal 2 Aquatic Moss 3 Rooted Vascular 4 Floating Vascular
SB*** – Streambed	1 Bedrock 2 Rubble 3 Cobble-Gravel 4 Sand 5 Mud 6 Organic 7 Vegetated
RS – Rocky Shore	1 Bedrock 2 Rubble
US – Unconsolidated Shore	1 Cobble-Gravel 2 Sand 3 Mud 4 Organic 5 Vegetated
EM - Emergent	2 Nonpersistent

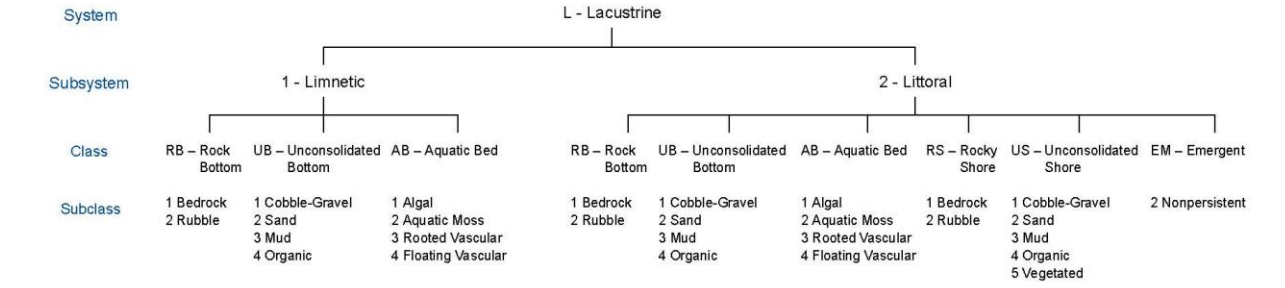
* **Intermittent** is limited to the **Streambed** Class
** **Rock Bottom** is not permitted for the **Lower Perennial** Subsystem
*** **Streambed** is limited to **Tidal** and **Intermittent** Subsystems

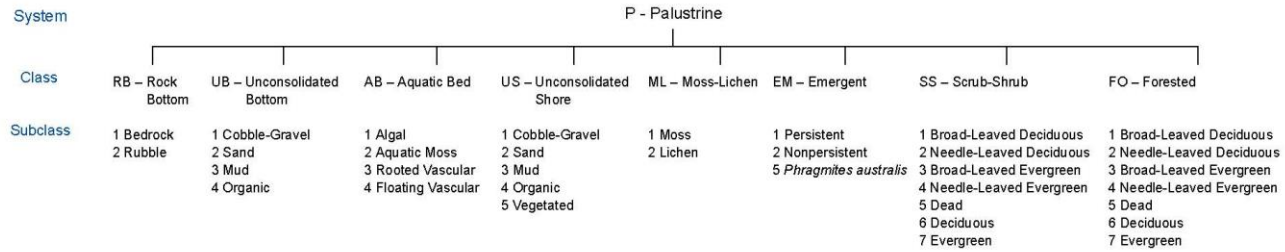
Page 1 of 2

Federal Geographic Data Committee, 2013. Classification of Wetlands and Deepwater Habitats of the United States.

February, 2019

WETLANDS AND DEEPWATER HABITATS CLASSIFICATION





MODIFIERS

In order to more adequately describe the wetland and deepwater habitats, one each of the water regime, water chemistry, soil, or special modifiers may be applied at the class or lower level in the hierarchy.

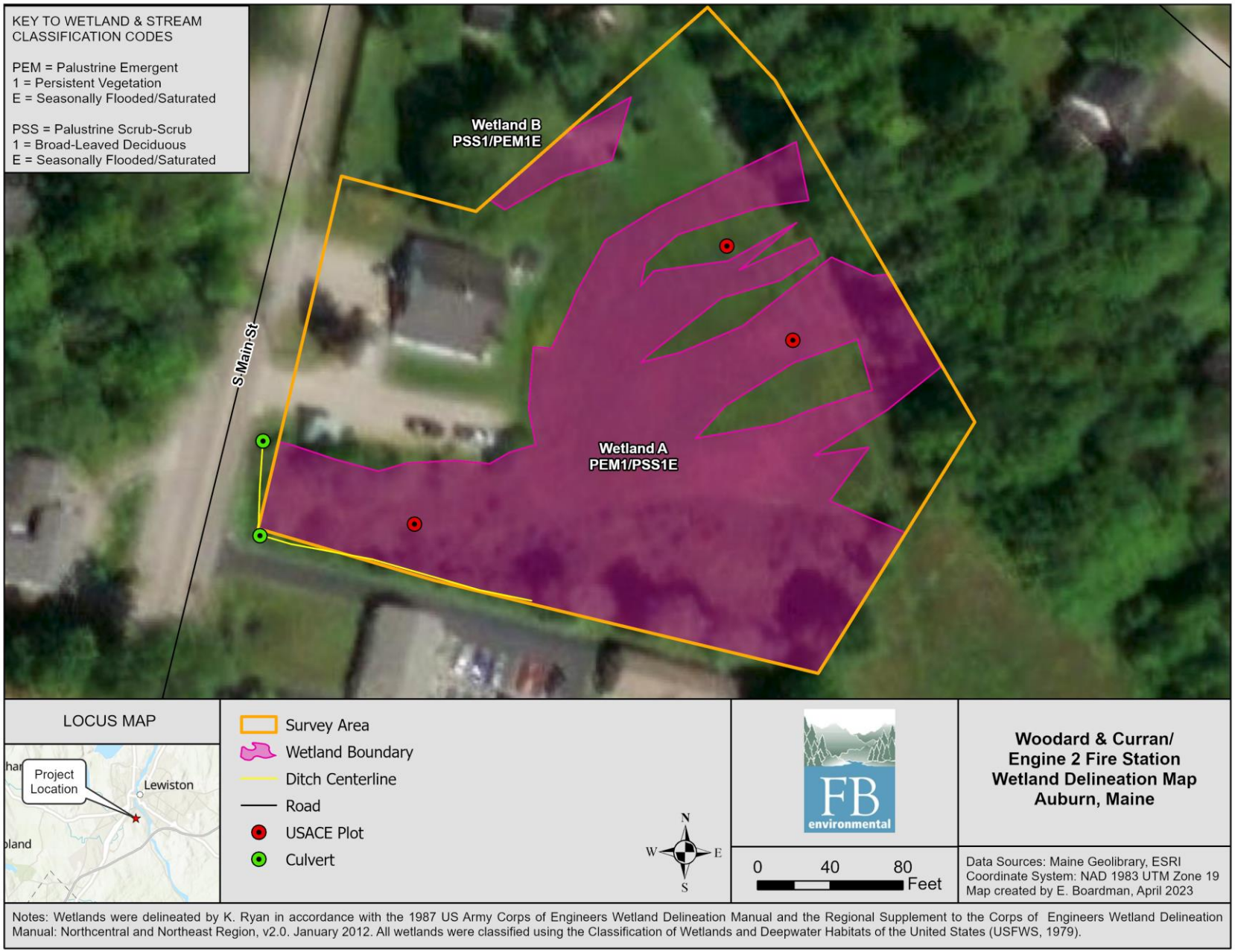
Water Regime			Special Modifiers	Water Chemistry		Soil
Nontidal	**Saltwater Tidal**	**Freshwater Tidal**		**Halinity/Salinity**	**pH Modifiers for Fresh Water**	
A Temporarily Flooded	L Subtidal	Q Regularly Flooded-Fresh Tidal	b Beaver	1 Hyperhaline / Hypersaline	a Acid	g Organic
B Seasonally Saturated	M Irregularly Exposed	R Seasonally Flooded-Fresh Tidal	d Partly Drained/Ditched	2 Euhaline / Eusaline	t Circumneutral	n Mineral
C Seasonally Flooded	N Regularly Flooded	S Temporarily Flooded- Fresh Tidal	f Farmed	3 Mixohaline / Mixosaline (Brackish)	i Alkaline	
D Continuously Saturated	P Irregularly Flooded	T Semipermanently Flooded-Fresh Tidal	m Managed	4 Polyhaline		
E Seasonally Flooded / Saturated		V Permanently Flooded-Fresh Tidal	h Diked/Impounded	5 Mesohaline		
F Semipermanently Flooded			r Artificial Substrate	6 Oligohaline		
G Intermittently Exposed			s Spoil	0 Fresh		
H Permanently Flooded			x Excavated			
J Intermittently Flooded						
K Artificially Flooded						

Page 2 of 2

Federal Geographic Data Committee, 2013. Classification of Wetlands and Deepwater Habitats of the United States.

February, 2019

ATTACHMENT 2. WETLAND DELINEATION MAP



ATTACHMENT 3. SITE PHOTOGRAPHS

Photo 1. The seasonally flooded/saturated scrub-shrub (PSS1E) portion of wetland A from the USACE plot.

Photo 2. The majority of Wetland A is mowed seasonally flooded/saturated wetland with emergent vegetation (PEM1E).

Photo 3. Wetland A from the USACE plot location (A-2 wet).

Photo 4. A representative soil sample, showing prominent redoximorphic features, from the mowed portion of Wetland A

Photo 5. View of the mowed portion of Wetland A.

Photo 6. Wetland B is a seasonally flooded/saturated system with areas of scrub-shrub and emergent marsh vegetation (PSS1/PEM1E).

Photo 7. A representative view of mowed upland within the Survey Area.

Photo 8. Ditch 1 runs parallel to the southern border of the Survey Area

Photo 9. Ditch 1 flows through a culvert under South Main Street.

Photo 10. View north of Ditch 1 where it enters the culvert under South Main Street.

ATTACHMENT 4. NATURAL RESOURCE AGENCY CORRESPONDENCE

STATE OF MAINE
DEPARTMENT OF AGRICULTURE, CONSERVATION & FORESTRY
177 STATE HOUSE STATION
AUGUSTA, MAINE 04333

JANET T. MILLS
GOVERNOR

AMANDA E. BEAL
COMMISSIONER

February 21, 2023

Elliott Boardman
FB Environmental
97A Exchange Street, Suite 305
Portland, ME 04101

Via email: elliottb@fbenvironmental.com

Re: Rare and exemplary botanical features in proximity to: Engine 2 Fire Station, 180 South Main Street,Auburn, Maine

Dear Mr. Boardman:

I have searched the Maine Natural Areas Program's Biological and Conservation Data System files in response to your request received February 20, 2023 for information on the presence of rare or unique botanical features documented from the vicinity of the project in Auburn, Maine. Rare and unique botanical features include the habitat of rare, threatened, or endangered plant species and unique or exemplary natural communities. Our review involves examining maps, manual and computerized records, other sources of information such as scientific articles or published references, and the personal knowledge of staff or cooperating experts.

Our official response covers only botanical features. For authoritative information and official response for zoological features you must make a similar request to the Maine Department of Inland Fisheries and Wildlife, 284 State Street, Augusta, Maine 04333.

According to the information currently in our Biological and Conservation Data System files, there are no rare botanical features documented specifically within the project area. Based on the information in our files and the landscape context of this project, there is a low probability that rare or significant botanical features occur at this project location.

This finding is available and appropriate for preparation and review of environmental assessments, but it is not a substitute for on-site surveys. Comprehensive field surveys do not exist for all natural areas in Maine, and in the absence of a specific field investigation, the Maine Natural Areas Program cannot provide a definitive statement on the presence or absence of unusual natural features at this site.

The Maine Natural Areas Program (MNAP) is continuously working to achieve a more comprehensive database of exemplary natural features in Maine. We would appreciate the contribution of any information obtained should you decide to do field work. MNAP welcomes coordination with individuals or organizations proposing environmental alteration or conducting environmental assessments. If, however, data provided by MNAP are to be published in any form, the Program should be informed at the outset and credited as the source.

MOLLY DOCHERTY, DIRECTOR
MAINE NATURAL AREAS PROGRAM
BLOSSOM LANE, DEERING BUILDING

maine DEPARTMENT OF Agriculture Conservation & Forestry

PHONE: (207) 287-8044
WWW.MAINE.GOV/DACF/MNAP

The Maine Natural Areas Program has instituted a fee structure of $75.00 an hour to recover the actual cost of processing your request for information. You will receive an invoice for $150.00 for two hours of our services.

Thank you for using MNAP in the environmental review process. Please do not hesitate to contact me if you have further questions about the Natural Areas Program or about rare or unique botanical features on this site.

Sincerely,

Lisa St. Hilaire

Lisa St. Hilaire | Information Manager | Maine Natural Areas Program
207-287-8044 | lisa.st.hilaire@maine.gov

JANET T. MILLS
GOVERNOR

STATE OF MAINE
DEPARTMENT OF
INLAND FISHERIES & WILDLIFE
353 WATER STREET
41 STATE HOUSE STATION
AUGUSTA ME 04333-0041

JUDITH CAMUSO
COMMISSIONER

April 4, 2023

Elliott Boardman
FB Environmental
97A Exchange Street, Suite 305
Portland, ME 04101

RE: Information Request – Engine 2 Fire Station Project, Auburn

Dear Elliott:

Per your request received on February 21, 2023, we have reviewed current Maine Department of Inland Fisheries and Wildlife (MDIFW) information for known locations of Endangered, Threatened, and Special Concern species; designated Essential and Significant Wildlife Habitats; and inland fisheries habitat concerns within the vicinity of the *Engine 2 Fire Station* project in *Auburn*. For purposes of this review, we are assuming tree clearing will not be part of your project.

Our information indicates no locations of State-listed Endangered, Threatened, or Special Concern species within the project area that would be affected by your project. Additionally, our Department has not mapped any Essential or Significant Wildlife Habitats or inland fisheries habitats that would be directly affected by your project.

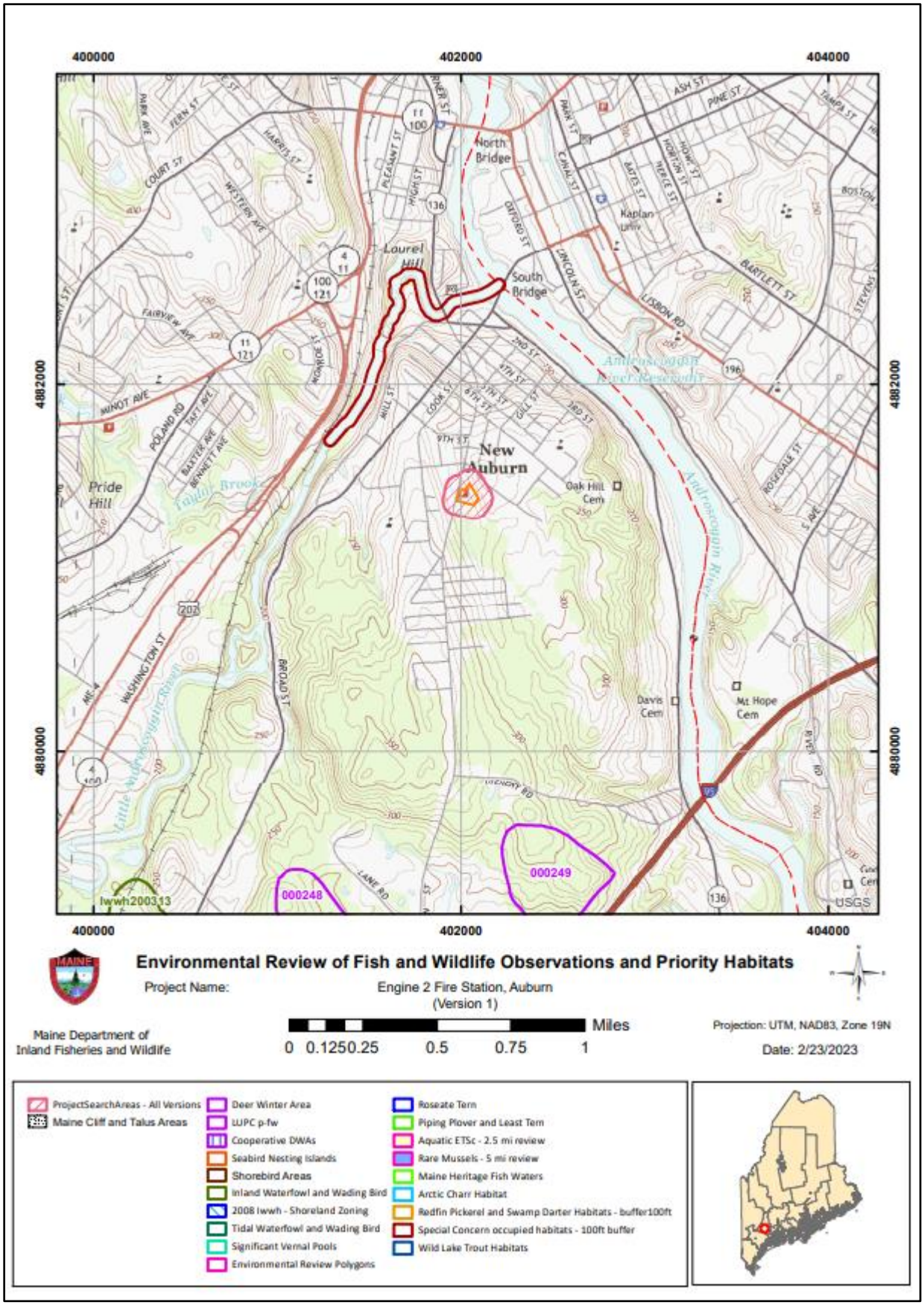
This consultation review has been conducted specifically for known MDIFW jurisdictional features and should not be interpreted as a comprehensive review for the presence of other regulated features that may occur in this area. Prior to the start of any future site disturbance, we recommend additional consultation with the municipality, and other state resource agencies including the Maine Natural Areas Program, Maine Department of Marine Resources, and Maine Department of Environmental Protection in order to avoid unintended protected resource disturbance.

Please feel free to contact my office if you have any questions regarding this information, or if I can be of any further assistance.

Best regards,

John Perry
Environmental Review Coordinator

PHONE: (207) 287-5254 | FISH AND WILDLIFE ON THE WEB: www.maine.gov/ifw | EMAIL ADDRESS: IFWEnvironmentalReview@maine.gov


400000
402000
404000
4882000
4880000
North Bridge
Laurel Hill
South Bridge
New Auburn
Pride Hill
Oak Hill Cem
Davis Cem
Mt Hope Cem
Kaplan
USGS
000248
000249
Iwwh2003.13
Environmental Review of Fish and Wildlife Observations and Priority Habitats
Project Name:
Engine 2 Fire Station, Auburn
(Version 1)
Maine Department of
Inland Fisheries and Wildlife
Miles
0 0.1250.25 0.5 0.75 1
Projection: UTM, NAD83, Zone 19N
Date: 2/23/2023
ProjectSearchAreas - All Versions
Maine Cliff and Talus Areas
Deer Winter Area
LUPC p-fw
Cooperative DWAs
Seabird Nesting Islands
Shorebird Areas
Inland Waterfowl and Wading Bird
2008 Iwwh - Shoreland Zoning
Tidal Waterfowl and Wading Bird
Significant Vernal Pools
Environmental Review Polygons
Roseate Tern
Piping Plover and Least Tern
Aquatic ETSc - 2.5 mi review
Rare Mussels - 5 mi review
Maine Heritage Fish Waters
Arctic Charr Habitat
Redfin Pickerel and Swamp Darter Habitats - buffer100ft
Special Concern occupied habitats - 100ft buffer
Wild Lake Trout Habitats

ATTACHMENT 5. COMPLETED USACE WETLAND DETERMINATION DATA FORMS

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Auburn Engine #2 Fire Station City/County: Auburn/Androscoggin Sampling Date: 31 March 23

Applicant/Owner: Woodard & Curran / City of Auburn State: ME Sampling Point: A-1 (wet)

Investigator(s): Kevin Ryan, Elliott Boardman Section, Township, Range:

Landform (hillside, terrace, etc.): Local relief (concave, convex, none): Concave Slope %: 2

Subregion (LRR or MLRA): LRR R Lat: Long: Datum:

Soil Map Unit Name: Scantic Silt Loam NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area**
Hydric Soil Present?	Yes X	No	**within a Wetland?** **Yes** X **No**
Wetland Hydrology Present?	Yes X	No	If yes, optional Wetland Site ID:

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No	Depth (inches): 0
Water Table Present?	Yes	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes X	No	Depth (inches): 0

Wetland Hydrology Present? **Yes** X **No**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: A-1 (wet)

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer negundo*	5	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
	5	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1. *Salix discolor*	25	Yes	FACW
2. *Swida sericea*	25	Yes	FACW
3. *Spiraea alba*	10	No	FACW
4.			
5.			
6.			
7.			
	60	=Total Cover	
Herb Stratum (Plot size: 5')			
1. *Lythrum salicaria*	30	Yes	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	30	=Total Cover	
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
		=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

_X_ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point A-1 (wet)

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 3/2	100					Loamy/Clayey	Silt Loam
2-6	2.5YR 4/2	95	7.5YR 5/6	5	C	M	Loamy/Clayey	Silty Clay Loam
6-16	2.5YR 4/2	85	7.5YR 5/6	15	C	M	Loamy/Clayey	Silty Clay Loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- X Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** ____

Remarks:

This data form is revised from Northcentral and Northeast Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 7.0, 2015 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Auburn Engine #2 Fire Station City/County: Auburn/Androscoggin Sampling Date: 31 March 23

Applicant/Owner: Woodard & Curran / City of Auburn State: ME Sampling Point: A-2 (wet)

Investigator(s): Kevin Ryan, Elliott Boardman Section, Township, Range:

Landform (hillside, terrace, etc.): Local relief (concave, convex, none): Concave Slope %: 3

Subregion (LRR or MLRA): LRR R Lat: Long: Datum:

Soil Map Unit Name: Hartand Very Fine Sandy Loam NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area**
Hydric Soil Present?	Yes X	No	**within a Wetland?** **Yes** X **No**
Wetland Hydrology Present?	Yes X	No	If yes, optional Wetland Site ID:

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- High Water Table (A2)
- Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Inundation Visible on Aerial Imagery (B7)
- Sparsely Vegetated Concave Surface (B8)
- Water-Stained Leaves (B9)
- Aquatic Fauna (B13)
- Marl Deposits (B15)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres on Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Thin Muck Surface (C7)
- Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- Surface Soil Cracks (B6)
- Drainage Patterns (B10)
- Moss Trim Lines (B16)
- Dry-Season Water Table (C2)
- Crayfish Burrows (C8)
- Saturation Visible on Aerial Imagery (C9)
- Stunted or Stressed Plants (D1)
- Geomorphic Position (D2)
- Shallow Aquitard (D3)
- Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No	Depth (inches): 0
Water Table Present?	Yes	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes X	No	Depth (inches): 0

Wetland Hydrology Present? **Yes** X **No**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: A-2 (wet)

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	=Total Cover		
Herb Stratum (Plot size: 5')			
1. *Juncus effusus*	20	Yes	OBL
2. *Phalaris arundinacea*	20	Yes	FACW
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	40 =Total Cover		
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
	=Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point A-2 (wet)

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	2.5YR 3/2	100					Loamy/Clayey	Texture: Silt loam
2-16	2.5Y 5/2	75	7.5YR 5/6	25	C	M	Loamy/Clayey	Silty Clay Loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- X Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** ____

Remarks:

This data form is revised from Northcentral and Northeast Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 7.0, 2015 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Auburn Engine #2 Fire Station City/County: Auburn/Androscoggin Sampling Date: 31 March 23

Applicant/Owner: Woodard & Curran / City of Auburn State: ME Sampling Point: A-3 (up)

Investigator(s): Kevin Ryan, Elliott Boardman Section, Township, Range: _____

Landform (hillside, terrace, etc.): _____ Local relief (concave, convex, none): Convex Slope %: 3

Subregion (LRR or MLRA): LRR R Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: Hartand Very Fine Sandy Loam NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No X	**Is the Sampled Area**
Hydric Soil Present?	Yes _____	No X	**within a Wetland?** **Yes** _____ **No** X
Wetland Hydrology Present?	Yes _____	No X	If yes, optional Wetland Site ID: _____

Remarks: (Explain alternative procedures here or in a separate report.)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No X	Depth (inches): _____
Water Table Present?	Yes _____	No X	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No X	Depth (inches): _____

Wetland Hydrology Present? **Yes** _____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: A-3 (up)

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	=Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	=Total Cover		
Herb Stratum (Plot size: 5')			
1. *Graminoid spp.*	100	Yes	
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 =Total Cover		
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
	=Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	0 (A)		0 (B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point A-3 (up)

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	2.5Y 4/3	100					Loamy/Clayey	Silty Clay Loam
2-12	2.5Y 4/3	99	2.5Y 5/6	1	C	M	Loamy/Clayey	Silty Clay Loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ High Chroma Sands (S11) (**LRR K, L)**
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) (**LRR K, L**)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

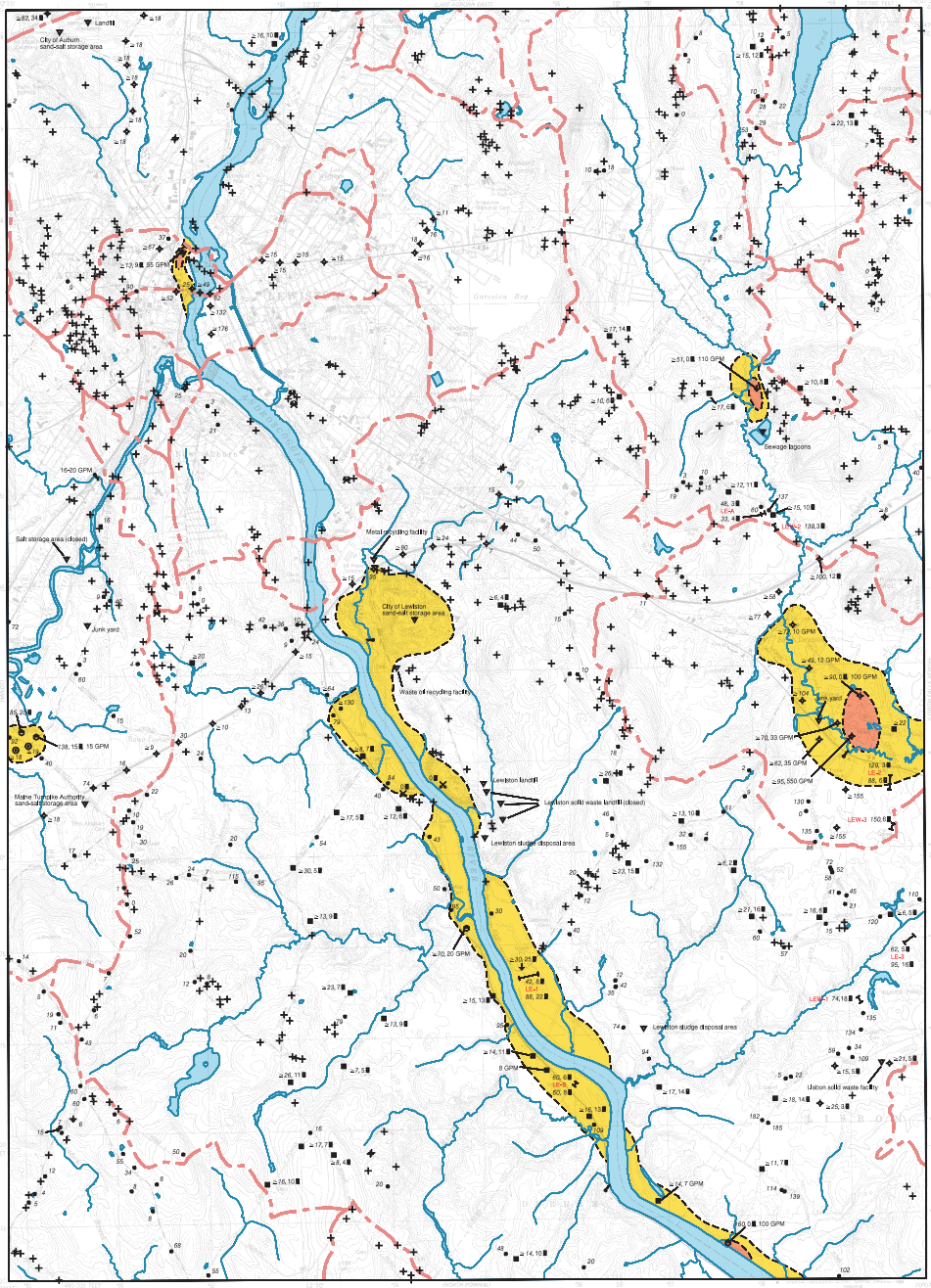
Hydric Soil Present? **Yes** ____ **No** X

Remarks:

This data form is revised from Northcentral and Northeast Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 7.0, 2015 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx)

ATTACHMENT 12: SIGNIFICANT SAND AND GRAVEL AQUIFER MAP

Significant Sand and Gravel Aquifers



Aquifer boundaries modified from: Williams, J. S., and Lanctot, E. M. (compilers), 1985, Hydrogeologic data for significant sand and gravel aquifers in parts of Androscoggin, Cumberland, and Sagadahoc Counties, Maine: Map 11: Maine Geological Survey, Open-File Map 85-82e, scale 1:50,000.

Well inventory data from U.S. Geological Survey Basic-Data Reports and additional data collected by Maine Geological Survey field assistants during the 1982 field season.

Drainage basin boundaries compiled by U.S. Geological Survey, Water Resources Division, Augusta, Maine, with funding from the Maine Low-Level Radioactive Waste Authority.

Quadrangle Location

SCALE 1 : 24,000

1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 0 1 KILOMETER

CONTOUR INTERVAL 10 FEET

TRUE NORTH

Topographic base from U.S. Geological Survey Lewiston quadrangle, scale 1:24,000 using standard U.S. Geological Survey topographic map symbols.

The use of industry, firm, or local government names on this map is for location purposes only and does not impute responsibility for any present or potential effects on the natural resources.

SIGNIFICANT SAND AND GRAVEL AQUIFERS (yields greater than 10 gallons per minute)

Approximate boundary of surficial deposits with significant saturated thickness where potential ground-water yield is moderate to excellent.

Surficial deposits with good to excellent potential ground-water yield; yields generally greater than 50 gallons per minute to a properly constructed well. Deposits consist primarily of glacial sand and gravel, but can include areas of sandy till and alluvium; yield zones are based on subsurface data where available, and may vary from mapped extent in areas where data are unavailable.

Surficial deposits with moderate to good potential ground-water yield; yields generally greater than 10 gallons per minute to a properly constructed well. Deposits consist primarily of glacial sand and gravel, but can include areas of sandy till and alluvium; yields may exceed 50 gallons per minute in deposits hydraulically connected with surface-water bodies, or in extensive deposits where subsurface data are available.

SURFICIAL DEPOSITS WITH LESS FAVORABLE AQUIFER CHARACTERISTICS (yields less than 10 gallons per minute)

Areas with moderate to low or no potential ground-water yield (includes areas underlain by till, marine deposits, eolian deposits, alluvium, swamps, thin glacial sand and gravel deposits, or bedrock); yields in surficial deposits generally less than 10 gallons per minute to a properly constructed well.

SEISMIC-LINE INFORMATION

Profiles for 12-channel seismic lines are shown in Figure 8 of Open-File Report 85-82a (Tepper and others, 1985), or may be viewed at the Maine Geological Survey. Length of 12-channel seismic lines as shown on the map is to scale. All single-channel lines ranged from 80 to 300 feet long and are not shown to scale.

53 — Depth to bedrock, in feet below land surface.

≥53 — Depth to bedrock exceeds depth shown (based on calculations).

12 — Depth to water level, in feet below land surface.

MAP-7 131, 23 — Twelve-channel seismic line, with depth to bedrock and depth to water shown at the midpoint of the line, in feet below land surface.

69, 12 / MAP-E / 72, 12 — Single-channel seismic line, with depth to bedrock and depth to water shown at each end of the line, in feet below land surface. Unless otherwise indicated, data shown above the line-identifier box refers to the northern end of the seismic line.

The 3-letter identifier for a line is an abbreviation for the topographic quadrangle. If the 3-letter identifier for the line is followed by a number (ex: MAP - 7, MAP - 4), the line is a 12-channel line. If the identifier is followed by a letter (ex: MAP - E, MAP- P), the line is a single-channel line. Single-channel seismic interpretations by D. H. Tepper. Twelve-channel seismic interpretations by D. H. Tepper and C. D. Neil.

GEOLOGIC AND WELL INFORMATION

50 — Depth to bedrock, in feet below land surface

≥13 — Penetration depth of boring; ≥ symbol refers to minimum depth to bedrock based on boring depth or refusal

6 — Depth to water level in feet below land surface (observed in well, spring, test boring, pit, or seismic line)

Gravel pit (overburden thickness noted in feet, e.g. 5-12')

Quarry

4 GPM — Yield (flow) of well or spring in gallons per minute (GPM)

Spring, with general direction of flow

Drilled overburden well

Dug well

Observation well (project well if labeled; nonproject well if unlabeled)

Test boring (project boring if labeled; nonproject boring if unlabeled)

Driven point

Test pit

Drilled bedrock well

Potential point source of ground-water contamination

Bedrock outcrop

Surface-water drainage-basin boundary; surface-water divides generally correspond to ground-water divides. Horizontal direction of ground-water flow generally is away from divides and toward surface-water bodies.

OTHER SOURCES OF INFORMATION

1. Tepper, D. H., Williams, J. S., Tolman, A. L., and Prescott, G. C., Jr., 1985, Hydrogeology and water quality of significant sand and gravel aquifers in parts of Androscoggin, Cumberland, Franklin, Kennebec, Lincoln, Oxford, Sagadahoc, and Somerset Counties, Maine: Maine Geological Survey, Open-File Report 85-82a, 106 p.
2. Locke, D. B., 1999, Surficial materials of the Lewiston quadrangle, Maine: Maine Geological Survey Open-File Map 99-60.
3. Smith, G. W., and Thompson, W. B., 1980, Reconnaissance surficial geology of the Lewiston 15' quadrangle, Maine: Maine Geological Survey, Open-File Map 80-24.
4. Caswell, W. B., 1987, Ground water handbook for the state of Maine, Second Edition: Maine Geological Survey, Bulletin 39, 135 p.
5. Thompson, W. B., 1979, Surficial geology handbook for coastal Maine: Maine Geological Survey, 68 p. (out of print)
6. Kendall, D. L., 1987, Glaciers and granite: A guide to Maine's landscape and geology: Down East Books, Camden, Maine, 240 p.
7. Thompson, W. B., and Borns, H. W., Jr., 1985, Surficial geologic map of Maine: Maine Geological Survey, scale 1:500,000.

Lewiston Quadrangle, Maine

Compiled by
Craig D. Neil

Preliminary aquifer boundaries mapped by:
Daniel B. Locke

Digital cartography by:
Michael E. Foley

Robert G. Marvinney
State Geologist

Cartographic design and editing by:
Robert D. Tucker
Bennett J. Wilson, Jr.

Funding for the preparation of this map was provided in part by the Maine Department of Environmental Protection.

Maine Geological Survey
Address: 22 State House Station, Augusta, Maine 04333
Telephone: 207-287-2801 **E-mail:** mgs@maine.gov
Home page: http://www.maine.gov/doc/nrimc/nrimc.htm

Open-File No. 99-22
1999

WHAT IS AN AQUIFER?

Ground water, as the name implies, is water found below the land surface in the pore spaces between sand grains and in fractures in the bedrock (see diagrams below). An *aquifer* is a water-bearing geologic formation capable of yielding a usable amount of ground water to a well. In Maine there are two types of aquifers: loose soil materials (such as sand, gravel, and other sediments) and fractured bedrock. A sand and gravel deposit is considered a *significant aquifer* when a well in that deposit is capable of being continuously pumped at a rate of 10 gallons per minute (gpm) or more. To sustain a yield of 10 gpm or more, a deposit must be permeable enough for water to flow readily into the well as it is pumped (see section on *porosity* and *permeability* below), and there must be a sufficient depth of water in the well so that it will not be pumped dry.

The diagram below shows a schematic cross section of a sand and gravel aquifer in Maine. The symbols above the diagram correspond to the well symbols shown on the map at left. Information typically shown for these wells includes type of well, depth to bedrock, depth to water, and well yield. The blue line in the diagram is the *water table*. The area below the water table is called the *saturated zone*, where all pore spaces between the sediment particles are filled with water. In order to yield water, a well must extend below the water table into the saturated zone. Notice that the water table corresponds to the water level in most wells and in the stream.

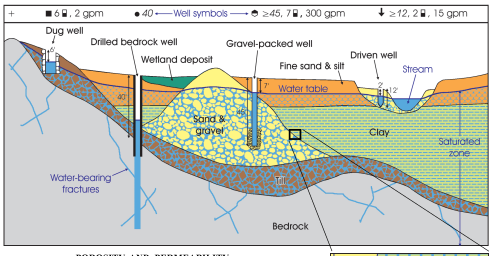
Several types of wells, common in Maine, are shown in the diagram. A *dug well* is a large diameter hole excavated by hand or backhoe. The hole is kept from caving in by installing a lining that may be stone, tile, or cement blocks. The hole must be deep enough to extend below the water table. The shallow dug well in the diagram has a yield of 2 gpm. Although the yield is often low, dug wells generally supply enough ground water for a household because of the large amount of water stored in the well.

A *gravel-packed* well is usually installed into coarse-grained sediment and is drilled with a much larger diameter than the final casing and screen diameter. To increase the yield and pumping efficiency of the well, the space around the well screen is filled with selected gravel that increases the permeability in the immediate vicinity of the well. The gravel-packed well in the diagram has a high yield of 300 gpm. Such high-yielding gravel-packed wells are commonly drilled for municipal or industrial water systems.

A *driven well* or *well point* can be installed into sand and gravel where the water table is within about 20 feet of the ground surface. A 2 to 3 inch diameter pipe, equipped with a well screen at its lower end, is driven into the deposit until the screen is below the water table. This pipe acts as a casing, and water is pumped directly from the aquifer. The driven well in the diagram has a significant yield of 15 gpm. Although the yield is relatively high, driven wells generally only supply a single household because very little water is stored in the well casing.

Wells of any type constructed in the other sediments shown in the diagram (clay or fine sand and silt) would yield some water, but yields would be lower than for wells in coarse-grained sand and gravel deposits.

Another type of well common in Maine is the *drilled bedrock well*. This well is drilled into the underlying rock with steel casing to isolate the well from potential surface-water contamination. In this type of well, water is found when the well hole intersects water-bearing fractures in the bedrock. Notice how the water level in this well is not the same level as the water table. The steel casing isolates the bedrock well from the overlying sediments. The water level is controlled by water pressure in the fractures in the bedrock and is not related to the water table in the overlying materials.

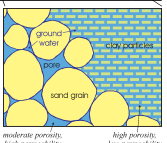


POROSITY AND PERMEABILITY

The diagram at right is an enlarged view of a section of the diagram above. Note that the section shown is below the water table and that ground water completely fills the pore spaces between the sediment grains. In an aquifer, the more pore space there is, the more water the aquifer can hold. This is called the *porosity* of a deposit. *Permeability* refers to the ability of a surficial deposit to transmit water. Permeability depends on the size of the spaces between the sediment grains.

Permeability is related to porosity, but is not the same. Porosity determines the capacity of the material to hold water. Permeability determines its ability to yield water. For example, clay is made of tiny particles with a large amount of pore space between them. However, the pore spaces are so small that they create a resistance to flow which reduces ground water permeability. Sand and gravel may not be as porous as clay, but the pore spaces are larger and better connected and the materials are much more permeable.

Permeability is an important characteristic since it determines whether ground water can actually be drawn into a pumping well.



HOW ARE AQUIFERS MAPPED?

Operating a twelve-channel seismograph, Piscataquis County, Maine.

When mapping sand and gravel aquifers, geologists visit gravel pits, stream banks, road cuts, and other surface exposures to describe materials and identify deposits. This surficial geology mapping is supplemented with seismic-refraction studies and the installation of observation wells and test borings. In addition, much information about an aquifer may already be available from water-company exploration, large construction projects, town well inventories, and other sources. This information, along with aerial photography and previously published maps, allows the geologist to define the boundaries of favorable surficial deposits and estimate how well the deposits will yield water to a well.

The boundaries of favorable surficial deposits do not necessarily coincide with the aquifer boundaries. In some areas, a thin cover of favorable coarse-grained material may overlie fine-grained sediments, till, or bedrock. A well in this area would not be able to sustain a yield of 10 gpm, so the area would not be mapped as an aquifer. In other areas, fine-grained sediments or till may overlie favorable coarse-grained sediments and the subsurface deposit may not be recognized as an aquifer.

Single- and 12-channel seismic-refraction studies are conducted to determine the saturated thickness of a deposit by establishing the depth to water table and bedrock surface. The 12-channel seismic survey has the additional advantage of providing the topography of the buried bedrock surface at a site.

Installing monitoring wells and drilling test borings provide direct information about the aquifer characteristics of a deposit. This work provides information on the depth to water table and bedrock surface, water quality, and how easily the sediment transmits water.

GROUND-WATER FLOW AND CONTAMINATION

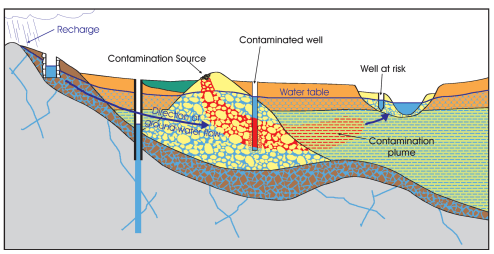
Ground water is replenished or *recharged* by rainwater and melting snow that soak into the soil. This water percolates downward and eventually reaches the water table. When recharge is high during spring snowmelt and fall rains, the amount of ground water increases and the water table rises. When recharge is low during the late summer or when the ground is frozen during the winter, the water table becomes lower.

Notice in the diagram below that ground water is not static; it flows. This concept is very important, especially when ground water becomes contaminated. Once in the ground-water system, contaminants usually travel along the paths followed by ground water and are sometimes able to migrate considerable distances over time.

In the diagram below, a plume of contamination originates at the source in the sand and gravel deposit. This source could be a landfill, a leaking fuel storage tank, or an accidental spill. As the contaminant seeps into the subsurface system and enters the aquifer, it flows with the ground water. In the diagram, the plume contaminated the gravel-packed well as it passed by. The driven well near the stream is not contaminated, but is at risk since the plume is flowing in that direction. The dug well on the hillside, however, is not affected because it is upgradient of the source, hence the contaminated ground water flows away from this well.

Once ground water is contaminated, it is very difficult and expensive to correct. To design a clean-up plan, monitoring wells are installed under the direction of a hydrogeologist or other specialist. These wells define the three-dimensional extent of the affected area. Sometimes it is possible to pump contaminants to the surface using remediation wells within the plume. Often the only solution for a homeowner is to install filtering devices or to abandon the well and find an alternative water supply.

Installing a monitoring well, Washington County, Maine.



HOW TO USE THIS MAP

Types of Information Shown on this Map: The yellow and red colored areas on the map indicate significant aquifers, zones where ground-water yield is estimated to be 10 gpm or greater. The boundaries of the aquifers are drawn by a geologist based, in part, on the well data shown on the map. Areas not mapped as aquifer may be thin or unsaturated sand and gravel deposits, surficial deposits other than sand and gravel, or bedrock.

The well data on the map provide information about the type of well, depth to water table, depth to bedrock, and yield of the wells in the area. This information is useful when making decisions about water supply, a drainage plan, or the need for blasting.

Information from seismic refraction studies also is shown on the map. Seismic studies give detailed information about depth to water table and depth to and shape of the bedrock surface. Geologic cross sections generated from seismic information are shown in associated reports listed in the references below the map at left.

Surface-water drainage-basin boundaries are also shown on the map. Horizontal direction of ground-water flow generally is away from drainage divides and toward surface-water bodies.

Uses of this Map: Sand and gravel aquifer maps are useful in two major categories of decision-making: ground-water supply and ground-water protection. For ground-water supply, these maps are useful in locating areas favorable for developing water supplies for municipal, industrial, or residential use. Information on the map, such as depth to bedrock and well yield, indicate the potential for ground-water production.

Ground-water protection is another important function of these maps. Knowledge of the location and extent of sand and gravel aquifers is critical when siting potential contamination sites such as landfills and salt storage facilities. When used in conjunction with other geologic information, this map can help planners and municipal officials make much more informed decisions to guide industrial growth or residential development.

If ground-water contamination occurs, the general trend of the plume migration can be deduced from these maps by analyzing the drainage basin boundaries and the local surface water bodies.

For further assistance in interpreting this map, contact a geologist at the Maine Geological Survey.

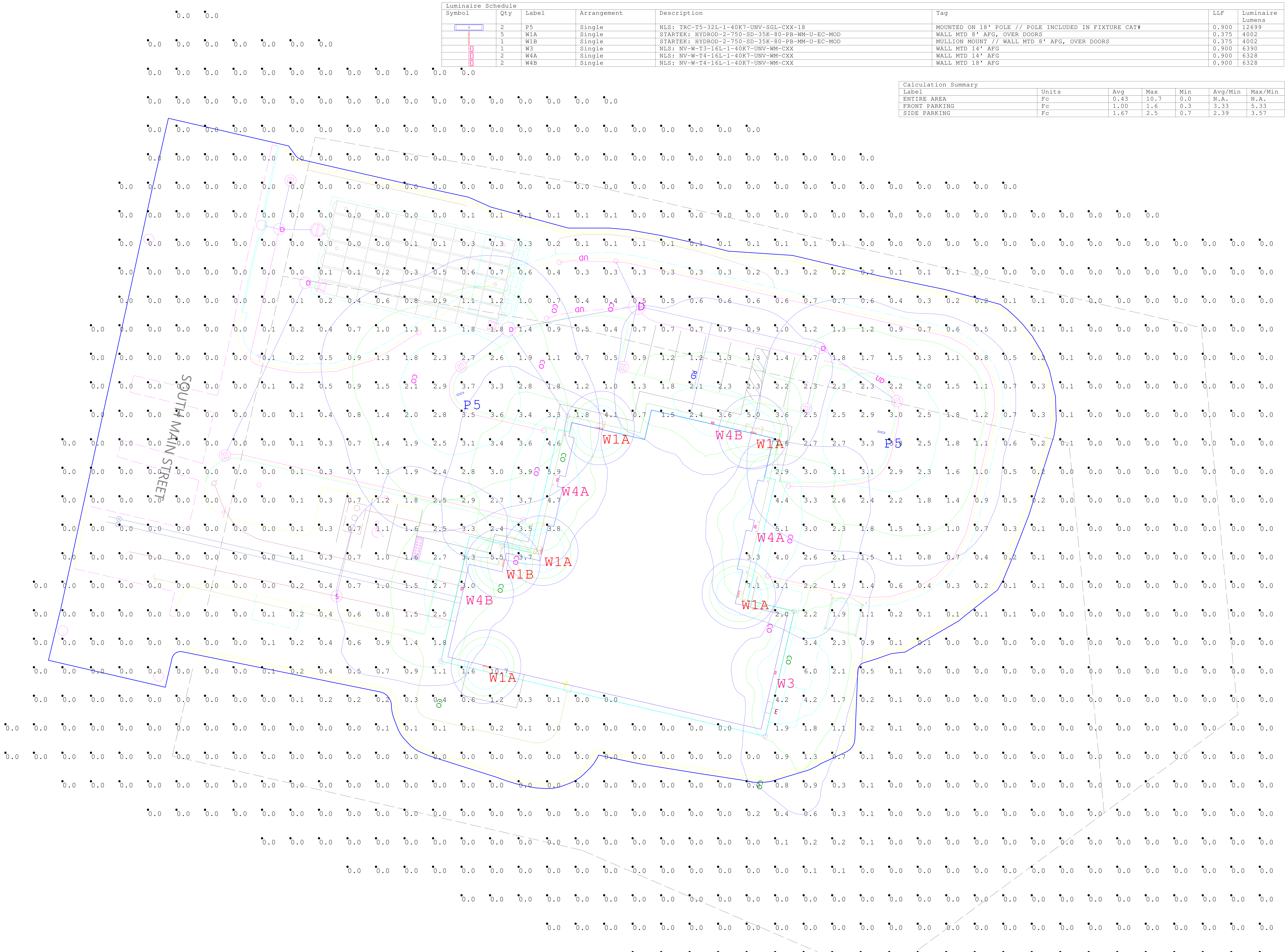
ATTACHMENT 13: LIGHTING PLAN & INFORMATION

Luminaire Schedule

Symbol	Qty	Label	Arrangement	Description	Tag	LLF	Luminaire Lumens
	2	P5	Single	NLS: TRC-T5-32L-1-40K7-UNV-SGL-CXX-18	MOUNTED ON 18' POLE // POLE INCLUDED IN FIXTURE CAT#	0.900	12699
	5	W1A	Single	STARTEK: HYDROD-2-750-SD-35K-80-PB-WM-U-EC-MOD	WALL MTD 8' AFG, OVER DOORS	0.375	4002
	1	W1B	Single	STARTEK: HYDROD-2-750-SD-35K-80-PB-MM-U-EC-MOD	MULLION MOUNT // WALL MTD 8' AFG, OVER DOORS	0.375	4002
	1	W3	Single	NLS: NV-W-T3-16L-1-40K7-UNV-WM-CXX	WALL MTD 14' AFG	0.900	6390
	2	W4A	Single	NLS: NV-W-T4-16L-1-40K7-UNV-WM-CXX	WALL MTD 14' AFG	0.900	6328
	2	W4B	Single	NLS: NV-W-T4-16L-1-40K7-UNV-WM-CXX	WALL MTD 18' AFG	0.900	6328

Calculation Summary

Label	Units	Avg	Max	Min	Avg/Min	Max/Min
ENTIRE AREA	Fc	0.43	10.7	0.0	N.A.	N.A.
FRONT PARKING	Fc	1.00	1.6	0.3	3.33	5.33
SIDE PARKING	Fc	1.67	2.5	0.7	2.39	3.57



CHARRON REFLEX LIGHTING

#	Date	Comments

Revisions

Drawn By: Michael O'Brien
Checked By:
Date:12/12/2024
Contact: mobrien@charroninc.com
Scale: NTS

AUBURN FIRE ENGINE 2
SITE LIGHTING

AUBURN, ME

TRAC 3

ARCHITECTURAL

LED WATTAGE CHART			
	16L	32L	48L
700 milliamps	36w (4385-4720 Lumens)	71w (8770-9439 Lumens)	104w (13154-14159 Lumens)
1050 milliamps	56w (6022-6482 Lumens)	106w (11797-12698 Lumens)	156w (17360-18686 Lumens)

FORM

- Elegant Rectilinear Extruded Aluminum Housing
- Corrosion Resistant Stainless Steel External Hardware
- Sleek, Low Profile Housing
- Spec Grade Performance
- Engineered For Optimum Thermal Management
- Anchor Base Plate For Easy Installation
- 8 Architectural Finishes Standard, RAL Colors Available

FUNCTION

- Micro Optics IES Distributions T2, T3, T4, T5
- 0-10V Dimming Drivers THD @ Max Load < 15% Power factor @ Max Load < 0.95
- Amber, 2700K, 3000K, 3500K, 4000K, Or 5000K
- 16L to 48L LED Configuration
- 36-156 Watts (Single Head Wattage)
- CRI 70, 80, or 90
- Extruded Aluminum Heat Sink
- 5 Mils Powder Coat
- Aluminum Pole .250 Wall

RELIABILITY

- Silicone Micro Optics
- 5 Year Standard Warranty
- IP67 Optics
- Reduces Energy Consumption And Costs Up To 65%
- Dark Sky Approved

BUY AMERICAN

To ensure the latest BAA/TAA/BABA Standards are being met, please select BAA, TAA, or BABA in the options section. Please contact the factory before placing an order for any NLS products requesting BAA (Buy American Act), TAA (Trade American Act), or BABA (Build America, Buy America).

Project Name:	Type:

TRC-3 ORDERING GUIDE

Cat#	Light Dist.	# of LEDs	Miliamps	Kelvin	Volts
Trac 3 **(TRC-3)**	Type 2 **(T2)** Type 3 **(T3)** Type 4 **(T4)** Type 5 **(T5)**	16 **(16L)** 32 **(32L)** 48 **(48L)**	700 **(7)** 1050 **(1)**	Amber 585-600nM **(AMBER)** [5, 8, 10, 11] 2700K, 70 CRI **(27K7)** [5] 2700K, 80 CRI **(27K8)** [1, 5] 3000K, 70 CRI **(30K7)** [5] 3000K, 80 CRI **(30K8)** [1, 5] 3500K, 80 CRI **(35K8)** 4000K, 70 CRI **(40K7)** 4000K, 80 CRI **(40K8)** [1] 5000K, 70 CRI **(50K7)** 5000K, 80 CRI **(50K8)** [1]	120-277 **(UNV)** 347-480 **(HV)**

Config.	Color	Controls Options	Options	Pole Height
Single **(SGL)** Double **(D-180)** MPF Triple **(TRI)** [2] MPF Quad **(QD)** [2] MPF **(MPF)** [2] Wall Mount **(WM)**	Bronze Textured **(BRZ)** White Textured **(WHT)** Smooth White Gloss **(SWT)** Silver Metallic **(SVR)** Black Textured **(BLK)** Smooth Black Gloss **(SBK)** Graphite Textured **(GPH)** Grey Textured **(GRY)** Green Textured **(GRN)** Hunter Green Textured **(HGN)** Custom **(CS)**	Nema 7-Pin Receptacle **(PE7)** [3] Button Photocell **(PC)** [4] FSP-211 with Motion Sensor/Photocell 9'-20' Heights **(FSP211-20)** [4, 12] 21'-40' Heights **(FSP211-40)** [4, 12] FSP-221 with Motion Sensor/Photocell 9'-20' Heights **(FSP221-20)** [13] 21'-40' Heights **(FSP221-40)** [13] Custom Controls Integration **(CCI)** [7] No Options **(NO)**	Marine Grade Finish **(MGF)** House Side Shield **(HSS)** Rotated Optic Left **(ROL)** Rotated Optic Right **(ROR)** Buy American Act **(BAA)** [9] Trade Agreement Act **(TAA)** [9] Build America Buy American **(BABA)** [9] No Options **(NO)**	16' **(16)** 18' **(18)** 20' **(20)** 22' **(22)** No Pole **(NO)** Aluminum Pole .250 Wall Comes With 12" Anchor Base 1" Thick, 1" Anchor Bolts

NOTES:
1. Consult Factory For Lead Time. Consult Factory For 90 CRI Requests.
2. MPF Mid Pole Fixture. Consult Factory
3. Only Available When Ordering NLS Pole
4. Universal Voltage 120-277
5. 3000k or lower must be selected to meet International Dark-Sky Association certification.
6. Consult Factory for 26' or above requests.
7. Please contact Factory for Custom Control Integration requests (nLight, NX, WaveLinx, Crestron, DMX/RDM, Synapse, Casambi, Dali II, Avi-On, or other control systems)
8. Turtle Safe
9. Consult factory for all BAA/TAA/BABA requests
10. Consult Factory for Lead Time
11. Not Available above 700mA
12. FSP-211, 120V/277V, 230-240VAC (single phase), 50/60Hz
13. FSP-221, 100–347VAC (single phase) or 208/230/480VAC (phase-to-phase)

PRODUCT SPECIFICATIONS

ELECTRICAL

- 120-277 Volts (UNV) or 347-480 Volts (HV)
- 0-10V dimming driver
- Driver power factor at maximum load is ≥ .95, THD maximum load is 15%
- LED Drivers Ambient Temp. Min is -40°C and Ambient Temp. Max ranges from 50°C to 55°C and, in some cases, even higher. Consult the factory for revalidation by providing the fixture catalog string before quoting and specifying it.
- All drivers, controls, and sensors housed in enclosed compartment
- CRI 70, 80, or 90
- Color temperatures: Amber, 2700K, 3000K, 3500K, 4000K, 5000K
- Surge Protection: 20KA supplied as standard.

CONSTRUCTION

- Extruded Aluminum
- Internal cooling fins
- Corrosion resistant external hardware
- One-piece silicone gasket ensures water tight seal for electronics compartment
- Two-piece silicone Micro Optic system ensures IP67 seal around each PCB

OPTIONS

- NEMA 7-Pin Receptacle (PE7). Only available when ordering NLS pole.
- PHOTO CELL (PC)
- DIMMING CONTROL (FSP-20) (FSP-40)
- MARINE GRADE FINISH (MGF)—A multi-step process creating protective finishing coat against harsh environments. Chemically washed in a 5 stage cleaning system. Pre-baked, Powder coated 3-5 mils of Zinc Rich Super Durable Polyester Primer. Oven Baked. Finished Powder Coating of Super Durable Polyester Powder Coat 3-5 mil thickness.
- SHIELD (HSS)—House Side Shield is designed for full property line cut-off.
- ROTATED OPTICS (ROL) (ROR)

CONTROL OPTIONS

- FSP-211 with Motion Sensor (FSP-XX)—Passive infrared (PIR) sensor providing multi-level control based on motion/daylight contribution.
  - All control parameters adjustable via wireless configuration remote storing and transmitting sensor profiles.
  - FSP-20 mounting heights 9-20 feet.
  - FSP-40 mounting heights 21-40 feet.
  - Includes 5 dimming event cycles, 0-10V dimming with motion sensing, re-programmable in the field.
  - Motion sensor mounted to access cover
  - FSIR-100 commissioning remote is required to change sensor settings. Please contact factory for ordering.
- NEMA 7-PIN RECEPTACLE (PE7)—An ANSI C136.41-2013 receptacle provides electrical and mechanical interconnection between photo control cell and luminaire. Dimming receptacle available two or four dimming contacts supports 0-10 VDC dimming methods or Digital Addressable Lighting Interface (DALI), providing reliable power interconnect.
- Controls Agnostic: Please contact factory for your preferred controls option. (nLight, NX, WaveLinx, Crestron, DMX/RDM, Synapse, Casambi, DALI II, Avi-On, or other control systems)

FINISH

- 3-5 mils electrostatic powder coat.
- NLS Lighting standard high-quality finishes prevent corrosion and protects against extreme environmental conditions

WARRANTY

Five-year limited warranty for drivers and LEDs.

OPTICS

Silicone optics high thermal stability and light output provide higher powered LEDs with minimized lumen depreciation. UV stability with scratch resistance increases exterior application durability. Silicone optics do not yellow, crack or brittle over time.

LISTINGS

- Certified to UL 1598
- UL 8750
- CSA C22.2 No. 250.0
- IP65/ IP67 Rated
- IK10 Rated

BUY AMERICAN OPTION

While all of the NLS Lighting products listed in this document qualify for the Buy America(n) Act of 1933, we reserve the right to change our listings without notice.

The information provided above is for general informational purposes only. We encourage you to consult legal professionals for advice particular to your projects concerning BAA, TAA, BABA or Buy America.

Additional NLS Products that meet BAA, TAA standards can be found at the following link:

https://nlslighting.com/buy-american/

NLS LIGHTING
701 Kingshill Place, Carson, CA 90746
Call Us Today (310) 341-2037
nlslighting.com

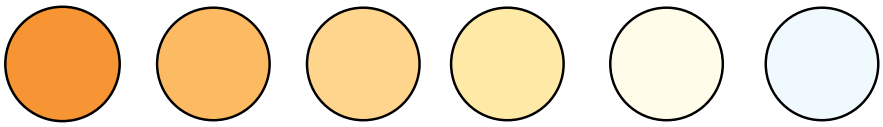
TRAC 3 LUMEN CHART

TRAC LUMEN CHART													
PART NUMBER	T2	LM/W	BUG	T3	LM/W	BUG	T4	LM/W	BUG	T5	LM/W	BUG	WATTS
TRC-3-16L-7-30K7	4,385	122	B1-U0-G1	4,409	122	B1-U0-G1	4,409	122	B1-U0-G1	4,495	125	B3-U0-G1	36
TRC-3-16L-7-40K7	4,604	128	B1-U0-G1	4,630	129	B1-U0-G1	4,630	129	B1-U0-G1	4,720	131	B3-U0-G1	36
TRC-3-16L-7-50K7	4,604	128	B1-U0-G1	4,630	129	B1-U0-G1	4,630	129	B1-U0-G1	4,720	131	B3-U0-G1	36
TRC-3-16L-1-30K7	6,022	108	B1-U0-G1	6,056	108	B1-U0-G1	6,056	108	B1-U0-G1	6,174	110	B3-U0-G1	56
TRC-3-16L-1-40K7	6,323	113	B1-U0-G1	6,359	114	B1-U0-G1	6,359	114	B1-U0-G1	6,482	116	B3-U0-G1	56
TRC-3-16L-1-50K7	6,323	113	B1-U0-G1	6,359	114	B1-U0-G1	6,359	114	B1-U0-G2	6,482	116	B3-U0-G1	56
TRC-3-32L-7-30K7	8,770	124	B2-U0-G2	8,819	124	B2-U0-G2	8,819	124	B2-U0-G2	8,990	127	B3-U0-G2	71
TRC-3-32L-7-40K7	9,208	130	B2-U0-G2	9,259	130	B2-U0-G2	9,259	130	B2-U0-G2	9,439	133	B3-U0-G2	71
TRC-3-32L-7-50K7	9,208	130	B2-U0-G2	9,259	130	B2-U0-G2	9,259	130	B2-U0-G2	9,439	133	B3-U0-G2	71
TRC-3-32L-1-30K7	11,797	111	B2-U0-G2	11,863	112	B2-U0-G2	11,863	112	B2-U0-G2	12,094	114	B4-U0-G2	106
TRC-3-32L-1-40K7	12,387	117	B2-U0-G2	12,456	118	B2-U0-G2	12,456	118	B2-U0-G2	12,698	120	B4-U0-G2	106
TRC-3-32L-1-50K7	12,387	117	B2-U0-G2	12,456	118	B2-U0-G2	12,456	118	B2-U0-G2	12,698	120	B4-U0-G2	106
TRC-3-48L-7-30K7	13,154	126	B2-U0-G2	13,228	127	B3-U0-G3	13,228	127	B3-U0-G3	13,485	130	B4-U0-G2	104
TRC-3-48L-7-40K7	13,812	133	B2-U0-G2	13,889	134	B3-U0-G3	13,889	134	B3-U0-G3	14,159	136	B4-U0-G2	104
TRC-3-48L-7-50K7	13,812	133	B2-U0-G2	13,889	134	B3-U0-G3	13,889	134	B3-U0-G3	14,159	136	B4-U0-G2	104
TRC-3-48L-1-30K7	17,360	111	B3-U0-G3	17,457	112	B3-U0-G3	17,457	112	B3-U0-G3	17,796	114	B4-U0-G2	156
TRC-3-48L-1-40K7	18,228	117	B3-U0-G3	18,330	117	B3-U0-G3	18,330	117	B3-U0-G3	18,686	120	B4-U0-G2	156
TRC-3-48L-1-50K7	18,228	117	B3-U0-G3	18,330	117	B3-U0-G3	18,330	117	B3-U0-G3	18,686	120	B4-U0-G2	156

3000k or lower must be selected to meet International Dark-Sky Association certification.

Lumen Maintenance Data							
Ambient Temperature	**Drive Current**	**L90 Hours***	**L70 Hours****	**30,000 Hours***	**50,000 Hours***	**60,00 Hours***	**100,000 Hours****
25°C	Up to 700mA	58,000	173,000	95.7%	91.6%	89.6%	82.1%
	1050mA	48,000	143,000	94.3%	89.5%	87.2%	78.5%
*Reported extrapolations per IESNA TM-21 **Projected extrapolations per IESNA TM-21							

LED KELVIN RANGE



AMBER 585-600 nm | 2700K 70 CRI | 3000K 70 CRI | 3500K 80 CRI | 4000K 70 CRI | 5000K 70 CRI

Color	Dominant or Peak Wavelength Range (nm)	
	Minimum	Maximum
Amber	585	600

TRAC 3 LUMEN CHART HSS

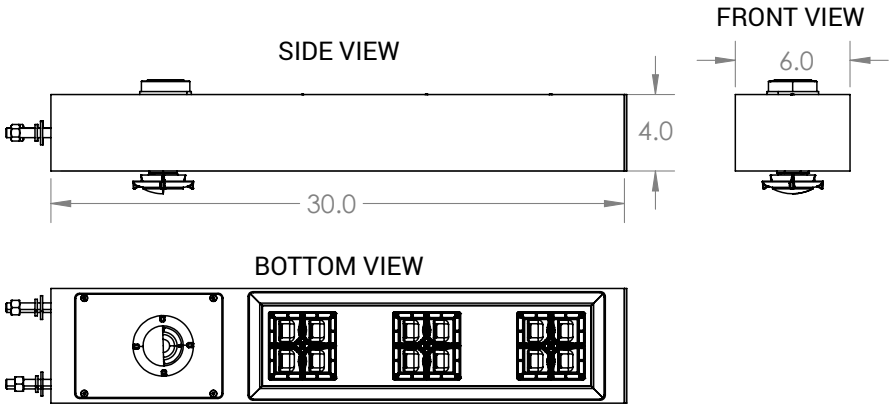
PART NUMBER	T2 HSS	LM/W	BUG	T3 HSS	LM/W	BUG	T4 HSS	LM/W	BUG	WATTS
TRC-3-16L-7-30K7	3,227	90	B1-U0-G1	3,120	87	B0-U0-G1	3,018	84	B0-U0-G1	36
TRC-3-16L-7-40K7	3,389	94	B1-U0-G1	3,276	91	B0-U0-G1	3,169	88	B0-U0-G1	36
TRC-3-16L-7-50K7	3,389	94	B1-U0-G1	3,276	91	B0-U0-G1	3,169	88	B0-U0-G1	36
TRC-3-16L-1-30K7	4,433	79	B1-U0-G1	4,285	77	B0-U0-G1	4,145	74	B1-U0-G1	56
TRC-3-16L-1-40K7	4,654	83	B1-U0-G1	4,499	80	B1-U0-G1	4,353	78	B1-U0-G1	56
TRC-3-16L-1-50K7	4,654	83	B1-U0-G1	4,499	80	B1-U0-G1	4,353	78	B1-U0-G1	56
TRC-3-32L-7-30K7	6,454	91	B1-U0-G1	6,239	88	B1-U0-G2	6,036	85	B1-U0-G2	71
TRC-3-32L-7-40K7	6,777	95	B1-U0-G2	6,551	92	B1-U0-G2	6,338	89	B1-U0-G2	71
TRC-3-32L-7-50K7	6,777	95	B1-U0-G2	6,551	92	B1-U0-G2	6,338	89	B1-U0-G2	71
TRC-3-32L-1-30K7	8,683	82	B1-U0-G2	8,394	79	B1-U0-G2	8,120	77	B1-U0-G2	106
TRC-3-32L-1-40K7	9,117	86	B1-U0-G2	8,813	83	B1-U0-G2	8,526	80	B1-U0-G2	106
TRC-3-32L-1-50K7	9,117	86	B1-U0-G2	8,813	83	B1-U0-G2	8,526	80	B1-U0-G2	106
TRC-3-48L-7-30K7	9,682	93	B1-U0-G2	9,359	90	B1-U0-G2	9,054	87	B1-U0-G2	104
TRC-3-48L-7-40K7	10,166	98	B1-U0-G2	9,827	94	B1-U0-G2	9,507	91	B1-U0-G2	104
TRC-3-48L-7-50K7	10,166	98	B1-U0-G2	9,827	94	B1-U0-G2	9,507	91	B1-U0-G2	104
TRC-3-48L-1-30K7	12,777	82	B1-U0-G2	12,352	79	B1-U0-G2	11,949	77	B1-U0-G2	156
TRC-3-48L-1-40K7	13,416	86	B1-U0-G2	12,969	83	B1-U0-G2	12,547	80	B1-U0-G2	156
TRC-3-48L-1-50K7	13,416	86	B1-U0-G2	12,969	83	B1-U0-G2	12,547	80	B1-U0-G2	156

PRODUCT SPECIFICATIONS

MODEL	WIDTH	DEPTH	LENGTH	WEIGHT
TRAC - 3	6”	4”	30”	21

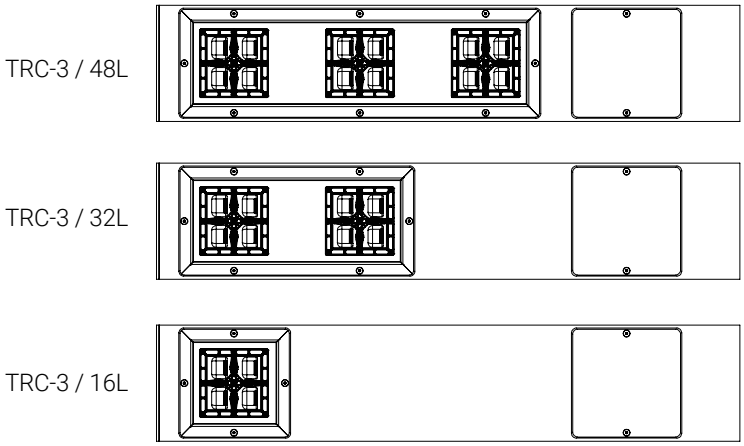
EPA	SGL	DBL
	1.0	2.0

DIMENSIONS



OPTICAL CONFIGURATIONS

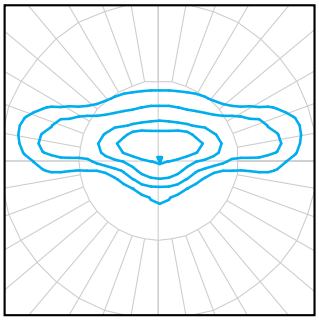
Rotatable Optics (ROR) Rotated Right, (ROL) Rotated Left options available. Optics field and factory rotatable.

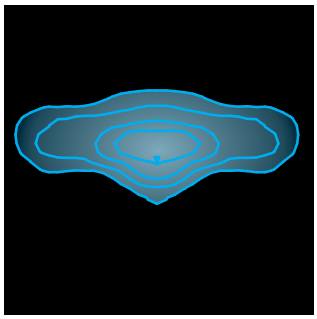


POLE EPA DATA

Catalog Number	Shaft Length, ft	Wall thick-ness, in.	Shaft dim., in.	Base Plate, in.	Bolt Circle, in.	Bolts	80 mph	Max. wt. (lb)	90 mph	Max. wt. (lb)	100 mph	Max. wt. (lb)	110 mph	Max. wt. (lb)	115 mph	Max. wt., lb	120 mph	Max. wt., lb	130 mph	Max. wt., lb	140 mph	Max. wt., lb	150 mph	Max. wt., lb	160 mph	Max. wt., lb	170 mph	Max. wt., lb	180 mph	Max. wt., lb
TRAC-16-250-12BC-136	16	0.250	4x6	12” sq.	12	1”x36”	20.0	500	20.0	500	16.6	415	12.9	323	11.4	285	10.0	250	7.8	195	6.0	150	4.4	110	3.5	88	2.4	60	1.8	-
TRAC-18-250-12BC-136	18	0.250	4x6	12” sq.	12	1”x36”	20.0	500	18.0	450	13.5	338	10.2	255	8.8	220	7.5	188	5.5	138	3.9	98	2.9	73	1.8	-	0.8	-	-	-
TRAC-20-250-12BC-136	20	0.250	4x6	12” sq.	12	1”x36”	20.0	500	15.7	393	11.5	288	8.3	208	6.8	170	5.9	148	3.8	95	2.4	60	1.2	-	0.3	-	-	-	-	-
TRAC-22-250-12BC-136	22	0.250	4x6	12” sq.	12	1”x36”	16.8	420	11.7	293	8.2	205	5.5	138	4.3	108	3.6	90	2.0	-	0.9	-	-	-	-	-	-	-	-	-

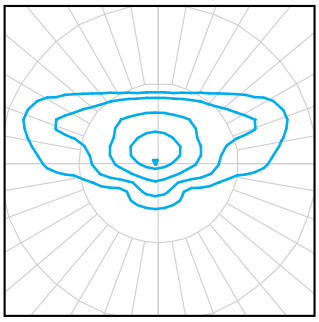
IES DISTRIBUTIONS

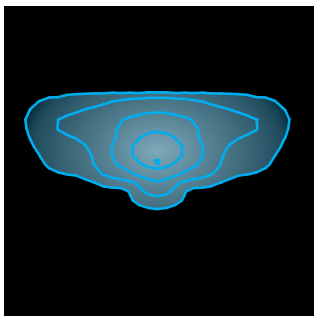




T2 OPTIC

The Type II distribution is used for narrow pathways and trails, narrow entrances of shopping centers, parking lots and office complex's.

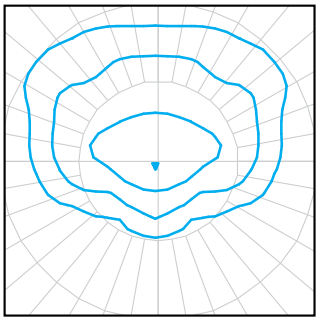


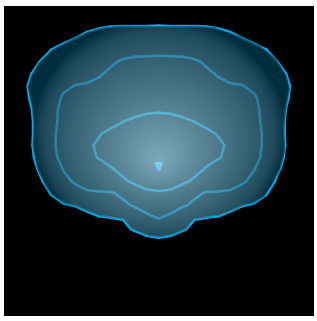


T3 OPTIC

The type III distribution is meant for roadway lighting, general parking areas and other areas where a larger area of lighting is required. Type III lighting needs to be placed to the side of the area, allowing the light to project outward and fill the area. This produces a filling light flow.

Type III light distributions have a preferred lateral width of 40 degrees. This distribution is intended for luminaires mounted at or near the side of medium width roadways or areas, where the width of the roadway or area does not exceed 2.75 times the mounting height.

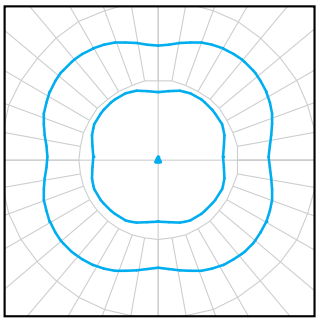


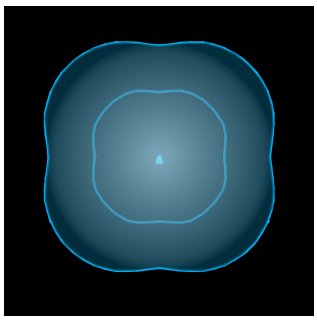


T4 OPTIC

The type IV distribution produces a semicircular light meant for mounting on the sides of buildings and walls. It's best for illuminating the perimeter of parking areas and businesses. The intensity of the Type IV lighting has the same intensity at angles from 90 degrees to 270 degrees.

Type IV light distributions have a preferred lateral width of 60 degrees. This distribution is intended for side-of-road mounting and is generally used on wide roadways where the roadway width does not exceed 3.7 times the mounting height.





T5 OPTIC - SYMMETRICAL

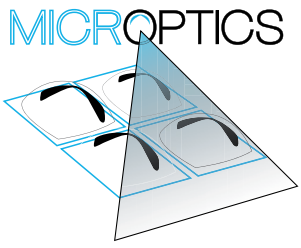
Type V produces a symmetrical distribution that has the same intensity at all angles. This distribution has a uniform symmetry of candlepower that is essentially the same at all lateral angles. It is meant for large, commercial parking lot lighting as well as areas where sufficient, evenly distributed light is necessary.

SILICONE OPTICS

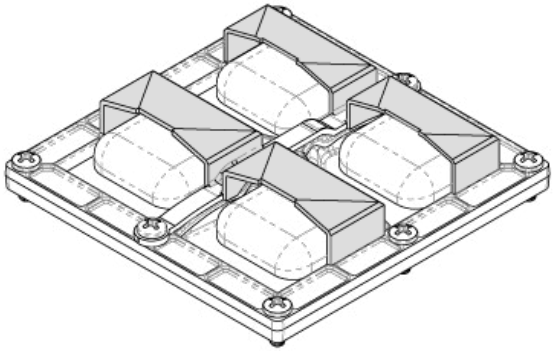
NLS Lighting Silicone Micro Optical System technology takes quality and performance to the highest level. Vandal resistant, superior clarity—Micro Optics have become the best and lasting solution in the industry.

BENEFITS

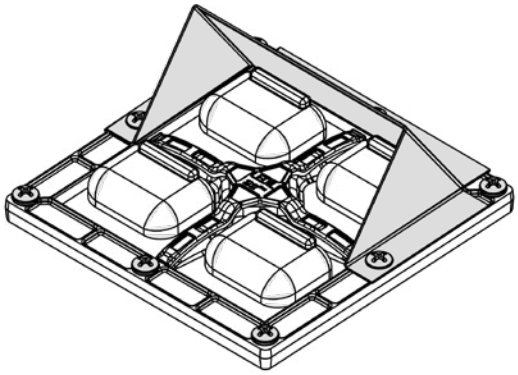
- Produces superior 96% clarity
- Heat resistant to 150° C, 50% higher than acrylic
- Ecologically friendly—no glare
- Vandal-resistant
- Does not brittle, crack, or yellow over time



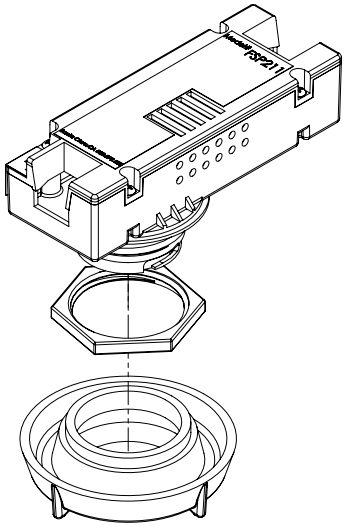
HOUSE SIDE SHIELD



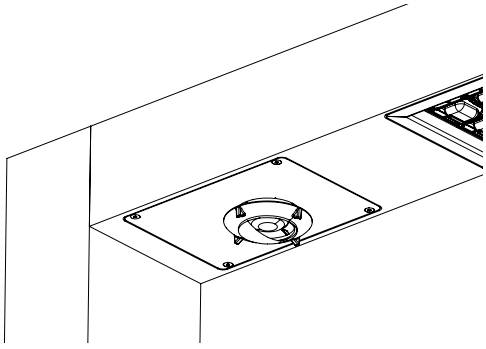
AUTOMOTIVE HOUSE SIDE SHIELD



FSP-211



MOTION SENSOR PLACEMENT



TRAC POLE

RECTANGULAR ALUMINUM POLE

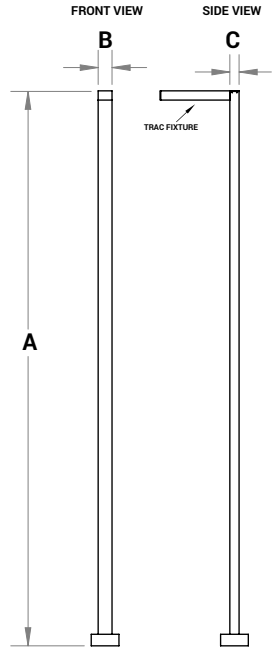
SHAFT
Rectangular Aluminum Pole (RAP) shaft (.250 Wall) is 6061 T6 Extruded Aluminum, 4 X 6 inch to provide a seamless transition into the Trac fixture. Poles have ground lug welded inside hand-hole opposite side of the pole extrusion. Pole Extrusion is conjoined to Anchor Base by welding internal and external to pole shaft. For custom configuration consult Factory.

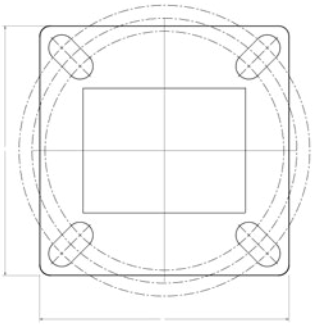
ANCHOR BOLTS
All anchor bolts are fully hot dipped galvanized and come with two galvanized nuts and washers per bolt. Anchor bolts are not included for Custom Bolt Circle. Anchor Bolts are "J" style, with a 4" hook at the end for added strength.1" Anchor Bolts are 1" diameter x 36" long with a 4" long "J" hook.

ANCHOR BASE
Base plates are machined from 6061 Aluminum, 12" square, 1" thick with 1" anchor bolts.

HAND HOLE COVER AND POLE CAP
All poles come with removable machined aluminum pole cap. All poles caps are powder coated to match the pole. All base covers are made of aluminum and powder coated to match the pole. Hand Hole is constructed of 3"x 5" rectangular aluminum tubing which is welded to pole shaft for added strength. Hand Hole covers are provided with internal bridge support and also powder coated to match pole finish.

FINISH
All poles have minimum 3 to 5 mils powder coat finish. All poles are sandblasted prior to powder coat application.

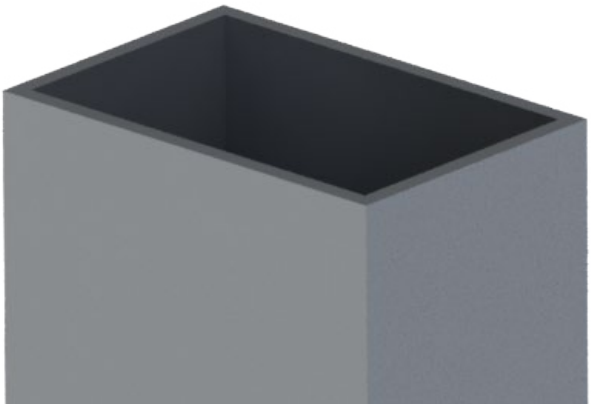




12" Base
***Consult Factory for Bolt Circle Template**

DIMEN-SION	RAP
A	16-22 ft. or Custom Height
B	6 in.
C	4 in.

RECTANGULAR ALUMINUM POLE DETAIL

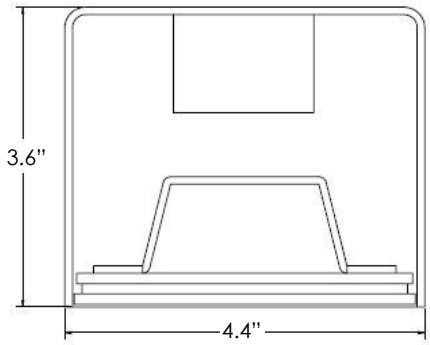


*Anchor Bolts are NOT included with Custom Bolt Circle.
*Do NOT pour concrete referencing this drawing. Consult Factory.
*Must Specify 4-Bolt Pattern.

Type:	
Project:	
REP/Agent:	
Order #:	

HYDRO BEAM DIRECT

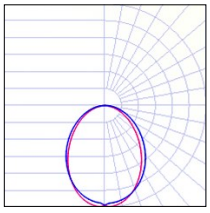
DIMENSIONS



FEATURES

- ★ 2', 3', 4', 6' and 8' individual units
- ★ Fixtures can be linked together for continuous rows
- ★ Efficacy up to 125 lm/W
- ★ Soft diffused direct lighting
- ★ Outdoor powder coat finishes available in white, black silver and bronze
- ★ Premium finishes also available
- ★ 0-10V dimming is standard**
- ★ Dim to 10% of output current is standard
- ★ 90 CRI (R9 50min) available
- ★ CA Title 24 / JA8 installation compatible
- ★ Wet Location rated
- ★ IP66
- ★ Impact Protection Rating (IK08)

DISTRIBUTION



SD= SatinIce Diffuse

LUMEN PACKAGES

Based on 3500K CCT. Other CCT available.

MODEL	LUMENS	INPUT WATTS	Lm/W
HYDRO-4-1000-SD-35K	4,000	36	110
HYDRO-8-1000-SD-35K	8,000	67	120

899 E Park Ave, Libertyville, IL 60048 ★ (877) STARTEK ★ www.starteklightingamerica.com

STARTEK LIGHTING AMERICA

Type:	
Project:	
REP/Agent:	
Order #:	

HYDRO BEAM DIRECT

HYDROD

SERIES	LENGTH	LUMENS PER FOOT	DISTRIBUTION	CCT	CRI
HYDROD	**2**= 2FT **3**= 3FT **4**= 4FT **6**= 6FT **8**= 8FT **xx**= Run Length **Sxx**= Symmetric Run Length	**350**= 350 LPF **500**= 500 LPF **750**= 750 LPF **1000**= 1000 LPF **XXX**= Custom LPF	**SD**= SatinIce Diffuse	**30K**= 3000K **35K**= 3500K **40K**= 4000K **50K**= 5000K	**80**= 80 **90**= 90 *(R9 50 min)*

FINISH	MOUNTING	VOLTAGE	ELECTRICAL
STANDARD **PW**= Powder Coat White **PB**= Powder Coat Black **PS**= Powder Coat Silver **PBR=** Powder Coat Bronze **PREMIUM** **RALxxxx**= Powder Coat RAL xxxx **PSFx**= Prem Stock Finish **CUSTOM** **PO**= Powder Other See pg. 10 for standard and premium options.	**SURFACE MOUNTS*** **SM(T)**= Surface Mount (Top-fed power) **SM(E)**= Surface Mount (End-fed power) **SM(S)**= Surface Mount (Side-fed power) **WALL MOUNTS** **WM**= Wall Mount **ARM**= Arm Wall Mount **MM**= Mullion Mount **RM**= Rotational Mount **(Not Available in Continuous Run)** **STEMS WITH CANOPY KITS** **STEMWxx**= Stem White, xx" **STEMBxx**= Stem Black, xx" **** 4G Vibration Certified***	**U**= 120-277	**1C**= Single Circuit **MC**= Multiple Circuits *(multiple switch legs across run length)* **EC**= Emergency Circuit *(separate power drops for EC fixtures)*

OPTIONS

BATTERIES
#EMB10= 10W EM Battery (# indicates quantity)

SURGE PROTECTOR
SRG= Surge Protector

SENSORS
MLR= Motion Sensor Large Range**

*****Motion sensor option removes dimming ability***

EXAMPLE: HYDROD-40-750-SD-35K-80-PW-SM(E)-U-1C-1EMB10

899 E Park Ave, Libertyville, IL 60048 ★ (877) STARTEK ★ www.starteklightingamerica.com

CONTINUOUS RUN

Continuous runs are configured with 2', 3', 4', 6' and 8' sections up to 50' in total length.

# of Sections	Total Length																																												
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
2	1			1								1								1								1								1			
3		1		1		1		1		1		1		1		1		1		1		1		1		1		1		1		1		1		1		1	
4			1			1			1					1					1			1			1		1			1			1		1			1	
6					1			1	1		2		1			1	3				1			1	1				1			1	1				1		
8							1			1		1	1	1	2	1		2	2	2	2	2	3	2	2	3	3	3	3	3	4	3	3	4	4	4	4	4	5

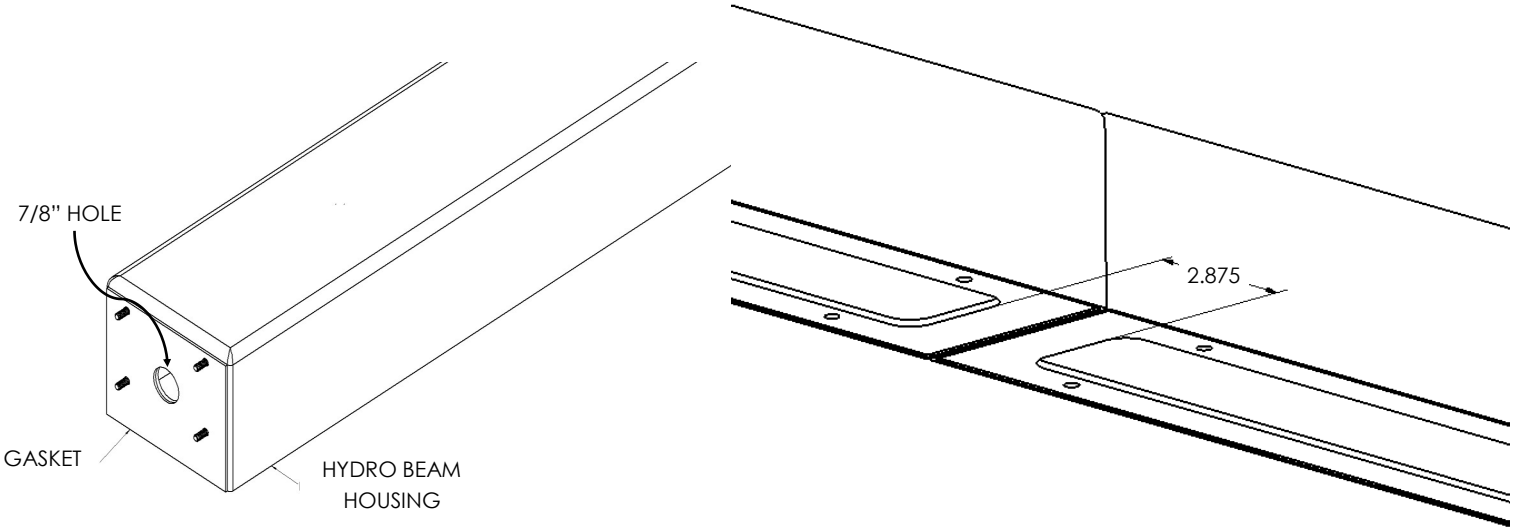
Sxx (Symmetric Run)

The construction of Sxx (y') is to build with equal length fixtures. The xx indicates the run length. The y' indicates the fixture length used to create the run. Please indicate this on your P.O. when placing your order.

S12 (2')	**2'**	**2'**	**2'**	**2'**	**2'**	**2'**
S12 (3')	**3'**	**3'**	**3'**	**3'**		
S12 (4')	**4'**	**4'**	**4'**			
S12 (6')	**6'**	**6'**				

LINKING

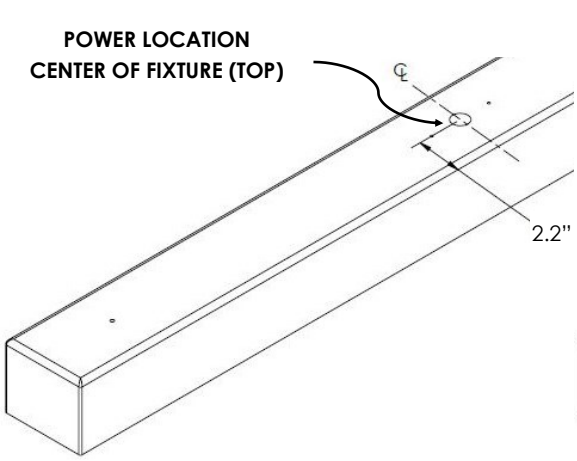
Typical continuous run installation shown below.



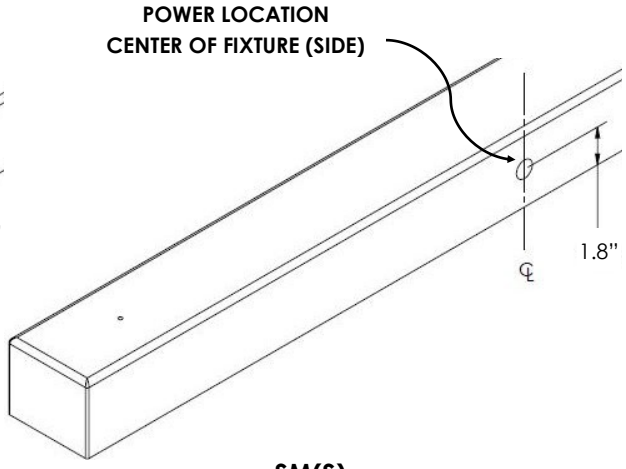
MOUNTING OPTIONS

SM(X) - Surface Mount (Top, End, or Side - fed power)

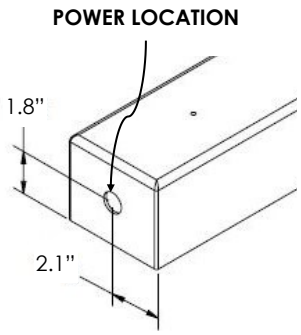
Power to be fed through one (1) 7/8" hole created in the top—SM(T), side—SM(S), or end—SM(E) of the lighting fixture. Hole can accommodate 1/2" conduit. Lighting fixture is to be wired with UL listed wet location fittings per NEC requirements, supplied by others.



SM(T)



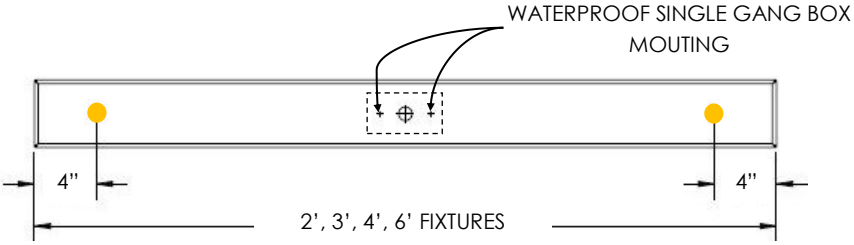
SM(S)

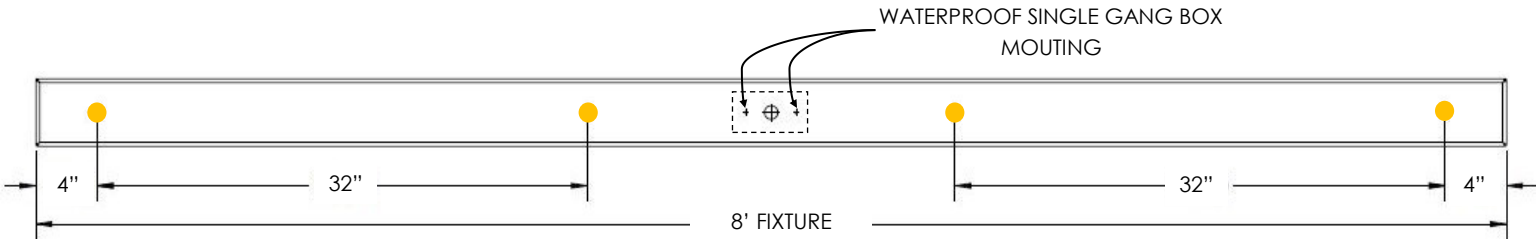


SM(E)

MOUNTING LOCATIONS—SM(T)

Mounting locations (●) vary between SM(T) option and others due to length and power location. Views below show top of fixtures.

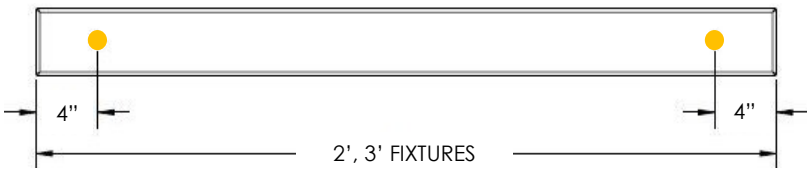


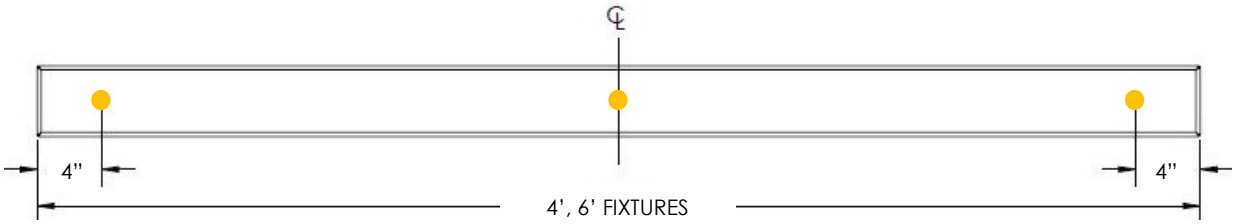


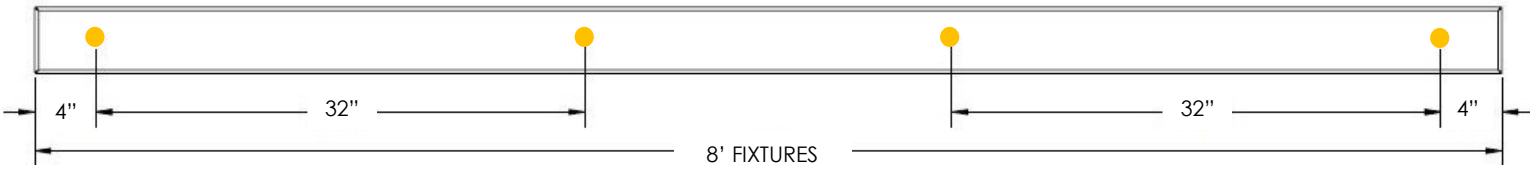
NOTE: Hole size at mounting locations is Ø.266".

MOUNTING LOCATIONS—SM(S) & SM(E)

The number of mounting locations (●) increase as fixtures get longer. Views below show top of fixtures.



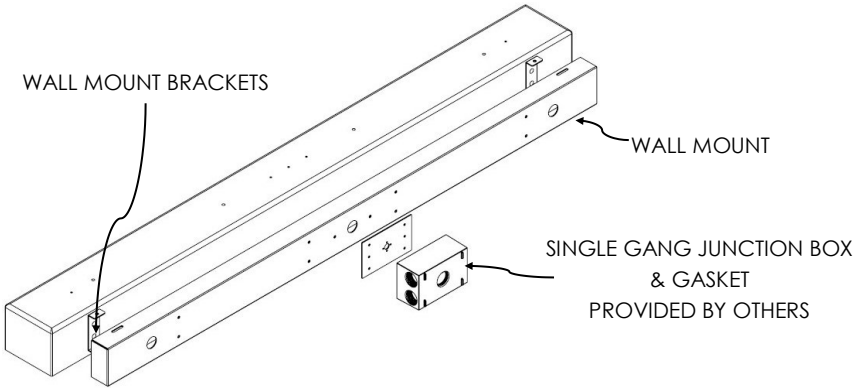


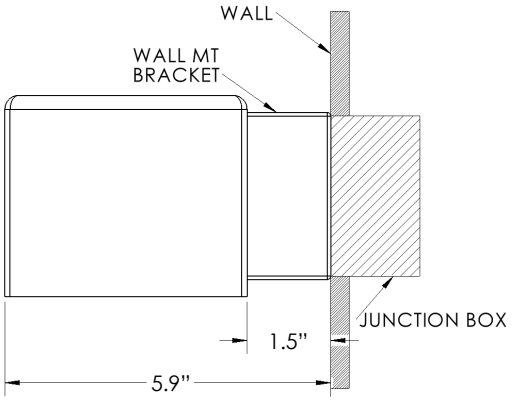


NOTE: Hole size at mounting locations is Ø.266".

MOUNTING OPTIONS CONTINUED

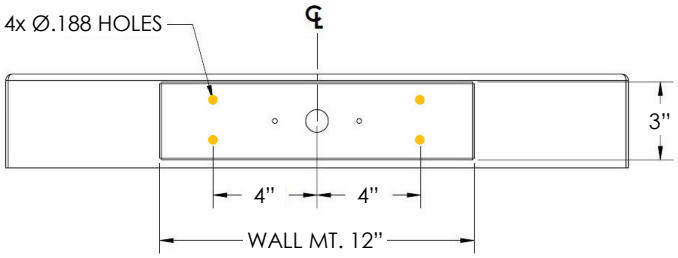
WM - Wall Mount



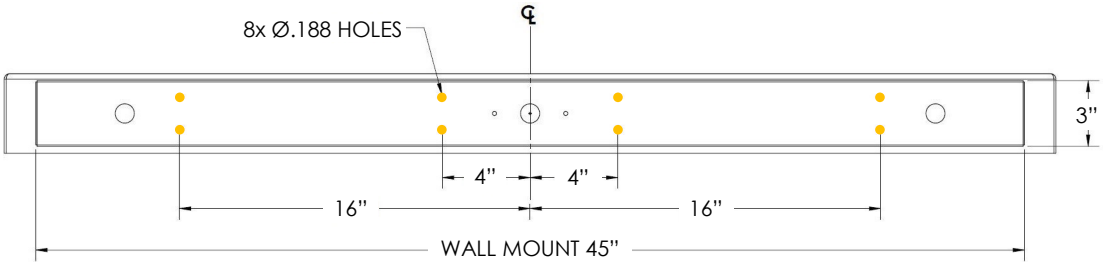


MOUNTING LOCATIONS—WM

Wall Mount for 2', 3' Fixtures

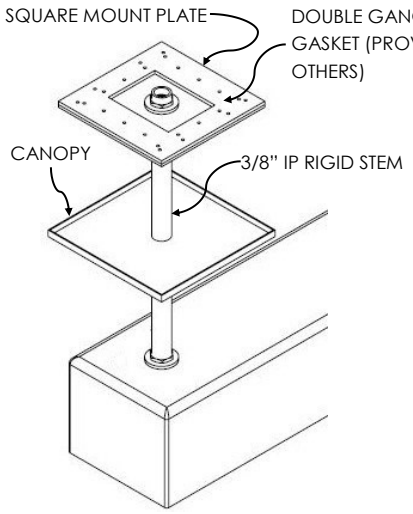


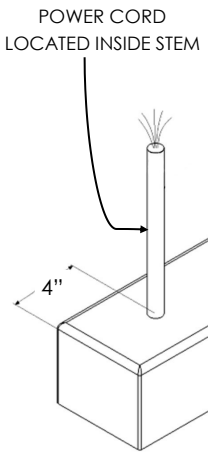
Wall Mount for 4', 6', 8' Fixtures

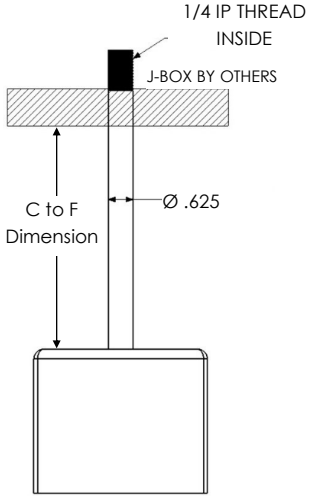


STEMXxx - Stem Mount with Canopy

When ordering, please specify stem mount length ("xx" indicates stem length). See table below for stem lengths available. Please also specify the color of the stem ("X" indicates stem color). Stem mounts can be ordered in white (STEMW) or black (STEMB).



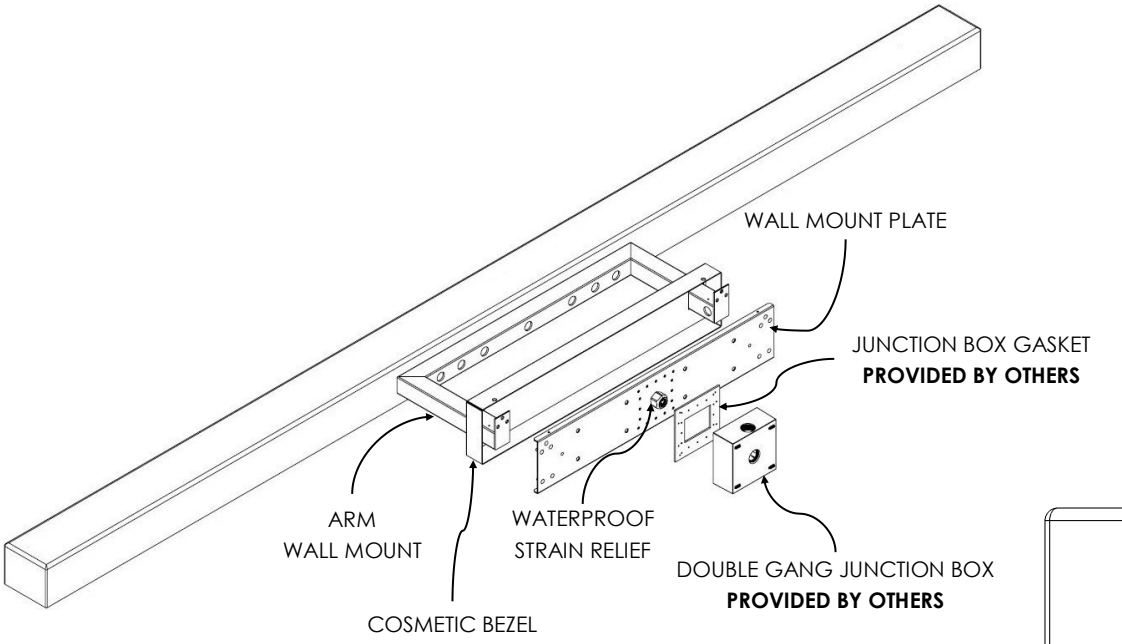


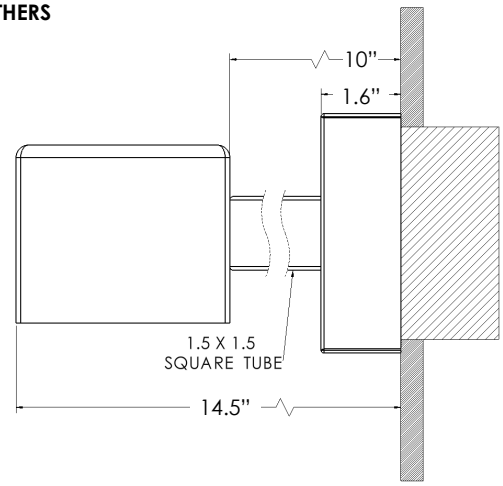


Stem Lengths		
STEMX(xx) (C to F)	**STEMX(xx) (C to F)**	**STEMX(xx) (C to F)**
6"	**24"**	**60"**
8"	**27"**	**66"**
9"	**30"**	**72"**
12"	**36"**	**78"**
15"	**42"**	**84"**
18"	**48"**	**90"**
21"	**54"**	**96"**

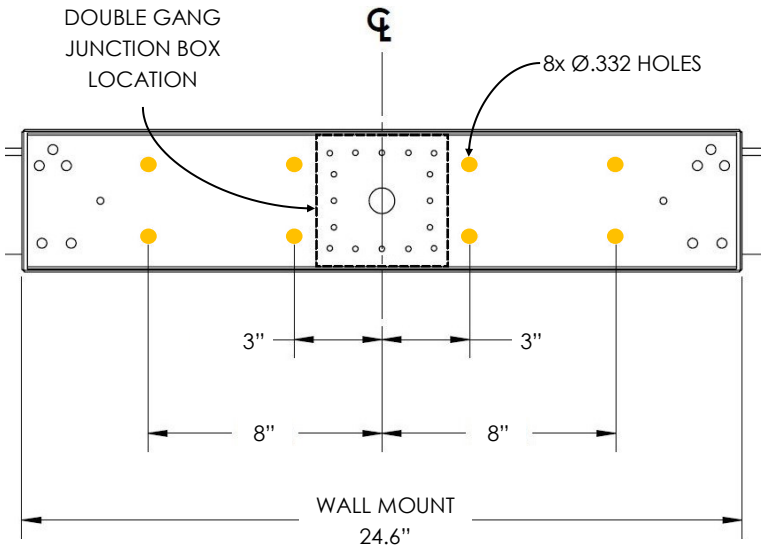
MOUNTING OPTIONS

ARM (Arm Wall Mount)



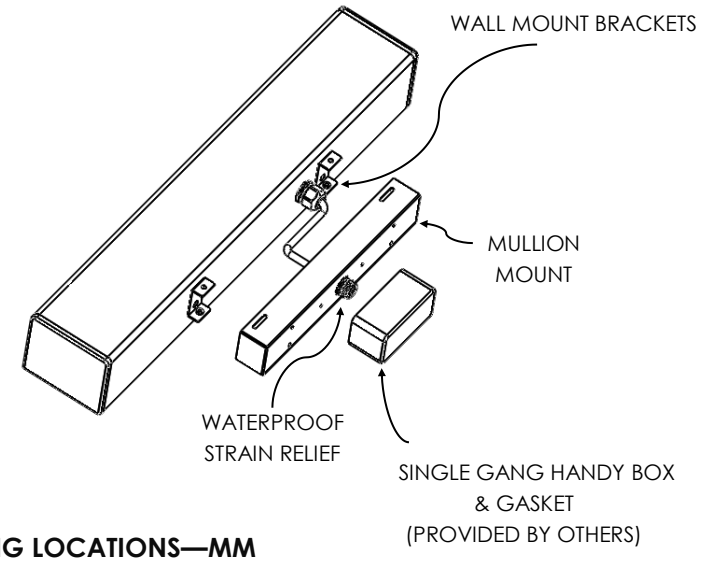


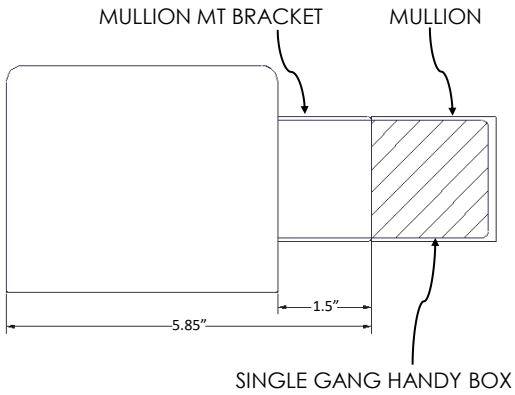
MOUNTING LOCATIONS—ARM



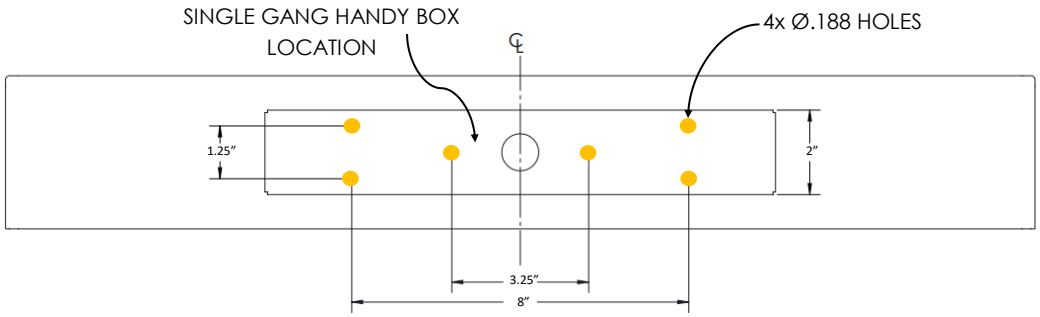
MOUNTING OPTIONS

MM (Mullion Mount)

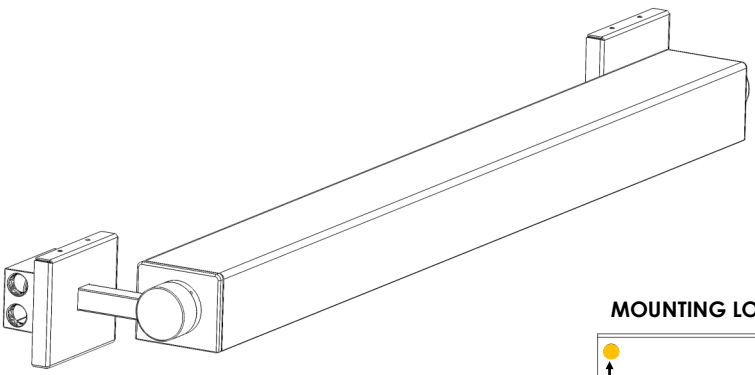


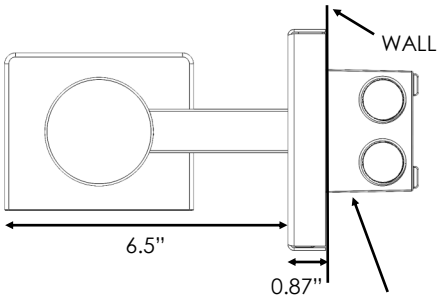


MOUNTING LOCATIONS—MM



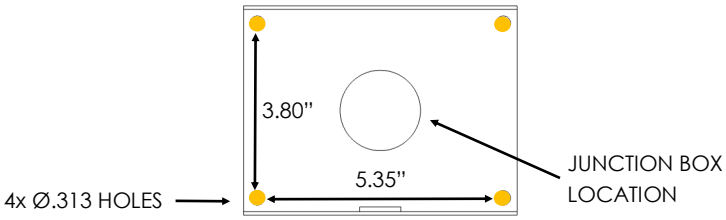
RM - Rotational Mount





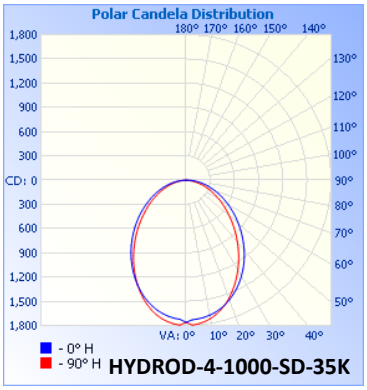
SINGLE OR DOUBLE GANG JUNCTION BOX & GASKET **PROVIDED BY OTHERS**

MOUNTING LOCATIONS



PERFORMANCE

HYDROD-X-1000-SD (80+ CRI)



Model	Lumens	Watts	LPW
HYDROD-4-1000-SD-30K	4000	37	107
HYDROD-4-1000-SD-35K	4000	36	110
HYDROD-4-1000-SD-40K	4000	36	112
HYDROD-4-1000-SD-50K	4000	35	115

Model	Lumens	Watts	LPW
HYDROD-8-1000-SD-30K	8000	68	117
HYDROD-8-1000-SD-35K	8000	67	120
HYDROD-8-1000-SD-40K	8000	66	122
HYDROD-8-1000-SD-50K	8000	64	125

FINISHES

STANDARD FINISHES

WHITE MINI TEXTURE

BLACK MINI TEXTURE

SILVER

BRONZE

Custom finishes (PO) will incur a set up fee and will add an extended lead time to your project.

PREMIUM STOCK FINISHES

PSF001 (WOOD#1)

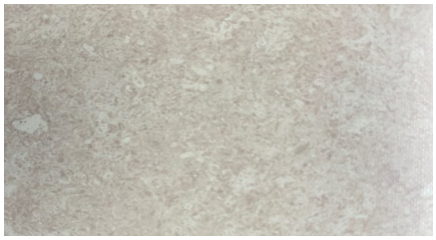
PSF002 (WOOD#2)

PSF003 (WOOD#3)

PSF004 (WOOD#4)

PSF005 (WOOD#5)

PSF006 (WOOD#6)



PSF007 (STONE #1)

PSF008 (STONE #2)

PSF009 (METAL #1)

NOTE: A minimal impact to lead times will apply to products specified with Premium Stock Finishes (PSF). It is not to be assumed that these finishes are stocked in our warehouse, but rather, are readily available to us for your project.

All other custom finishes (PO) will incur a set up fee and will add an extended lead time to your project.

SPECIFICATIONS

Housing
Nominal 3.6" x 4.4" x 0.090 thick aluminum housing

Color
Colors for the housing are available in a powder coated white, black silver and bronze. Consult factory for custom colors.

Luminaire Length
2', 3', 4', 6' or 8' lengths are available for a single stand-alone section. Using contractor provided conduit, sections can be joined to form longer rows up to 50'.

Lensing
0.125" Thick Impact resistant outdoor (F1) rated polycarbonate lensing.

Source
Variable lumen packages are available in four color temperature options (3000K, 3500K, 4000K and 5000K) — all within 3 MacAdam ellipses.

Certification
Intertek cETLus Wet Location Listed. RoHS (Restriction of Hazardous Substances) and Buy American Act Compliant.

Battery
Bodine battery providing up to 1200lm(10W) for 90 minutes. UL924 listed. Class 2 compliant. Meets Title 20 CEC (California Energy Commission) efficiency standards.

Environment
Suitable for dry, damp, and wet locations.
Operating temp.: -40°C to +50°C
-40°F to +122°F

Dimming Driver
Osram Optotronic Outdoor LED Driver allows tunable output currents to achieve infinite configurations of output. UL Class P recognized. 0-10v interface can be wired as Class 1 or Class 2 circuit.

Packaging
Sustainably manufactured outside cardboard box and biodegradable, protective poly-foam luminaire inserts.

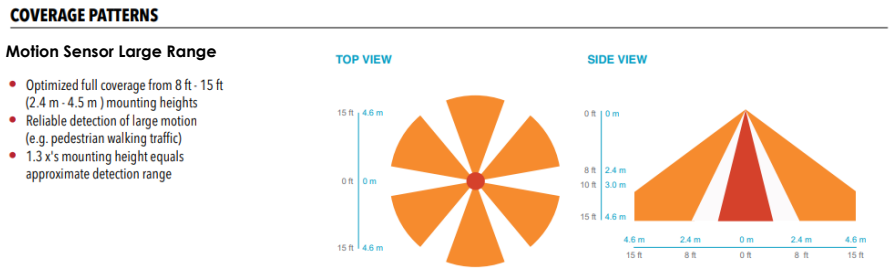
WARRANTY
5-year limited warranty. Complete warranty terms can be located at:

https://starteklightingamerica.com/wp-content/uploads/2019/11/Hydro_Beam_Warranty.pdf

Note: Actual performance may differ as a result of installation environment and final application.
All values are design or typical values, measured under laboratory conditions, at 25°C (77°F) .

CONTROL

Sensor
VERTEX Fixture Integrated Occupancy Sensor with Dimming Photocell. Ideal for standalone or network lighting control applications. Its ultra-small footprint enables seamless integration into an indoor or outdoor luminaires without disrupting aesthetics or requiring additional mounting space. Its versatility allows for mounting at various heights up to 15ft detecting major and minor motion movement.

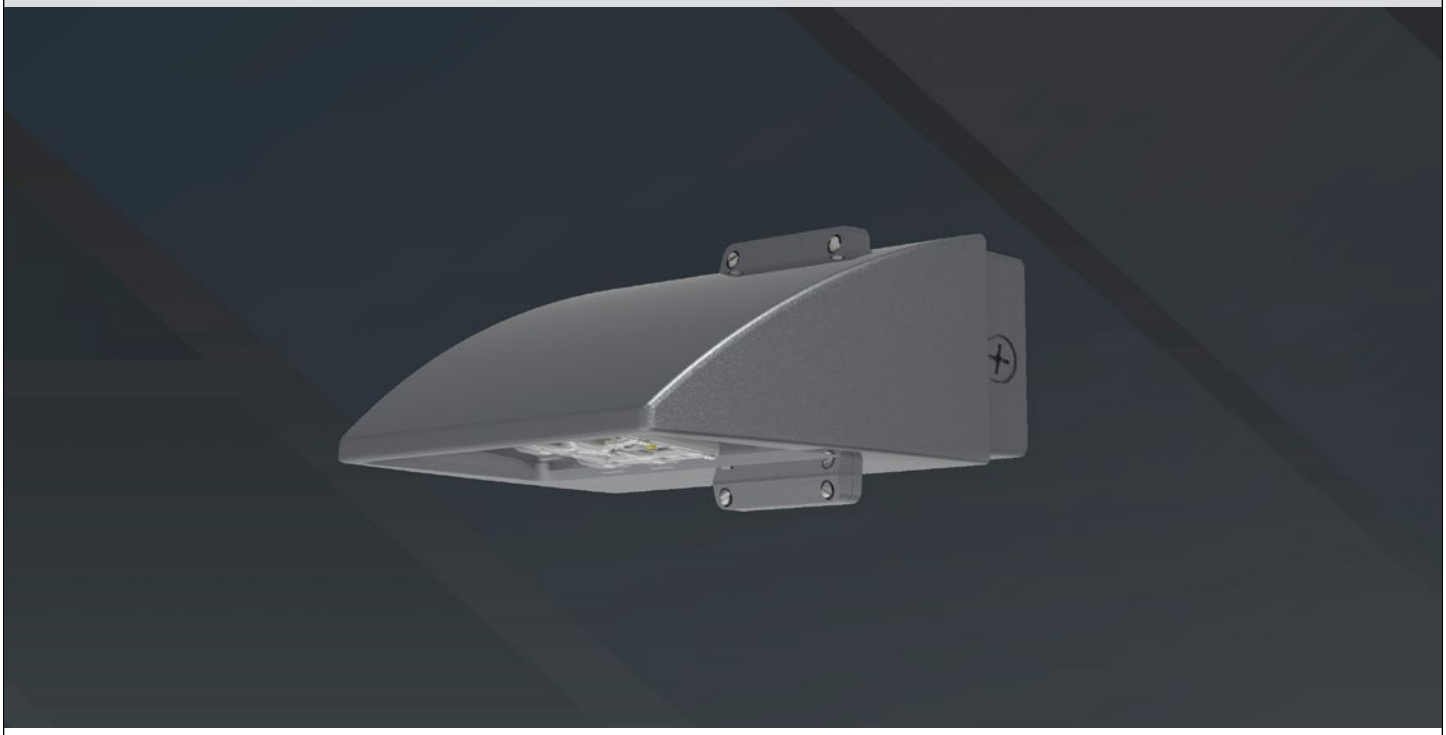


Specification
Input Rating : 3.3V-5V(Voltage), 5mW (Mega Power)
Environmental Specification : -10°C - 70°C (Std. Operating Temp.), -40°C - 70°C (LT Operating Temp)
Output Rating : Not Applicable

899 E Park Ave, Libertyville, IL 60048 ★ (877) STARTEK ★ www.starteklightingamerica.com

NV-W

ARCHITECTURAL HIGH PERFORMANCE FULL CUTOFF WALL PACK



LED WATTAGE CHART		
	16L	32L
400 milliamps	21w	-
530 milliamps	29w	-
700 milliamps	37w	71w
1000 milliamps	-	100w
1050 milliamps	56w	

KEY FEATURES

- Ideal for Exterior Walls, Entryways, Pathways, New Construction and Renovation, Warehouse and Receiving Docks, Court Yards, and School Playgrounds
- Sleek Minimalistic Design of the the NV-W (up to 11,000 Lumens, 12”W x 9”D x 5.5”H) Compliments the Design of the NV-W2 (up to 24,000 Lumens, 18”W x 9.38”D x 5”H)
- Amber, 2700K, 3000K, 3500K, 4000K, 5000K CCT Multichip High Power 70 & 80 CRI LEDs
- IP65 Rated Against Dust & Water Ingress, IK10 Rated for Tamper/ Vandalism/Impact Protection
- 20kA Surge Protection (120V - 480V) Cold Weather Integrated Battery Back-Up Safety Options
- Silicone Optics providing 96% Clarity and Heat Resistant up to 150°C
- 9 Standard Finishes, Custom Finish and Marine Grade Finish Available
- Controls Agnostic, Compatible with Most Control Systems and Sensors
- Environmentally Friendly Product Which Reduces Energy Consumption, L70 > 100,000 hours
- IDA qualified for 3000K CCT and Lower for Down-light Application, Reducing Light Pollution and Trespass
- Buy America(n) Option Available, Quick Mount for Easy Installation
- Cost Competitive and Short Shipping Lead Times in Days & Weeks

BUY AMERICAN

To ensure the latest BAA/TAA/BABA Standards are being met, please select BAA, TAA, or BABA in the options section. Please contact the factory before placing an order for any NLS products requesting BAA (Buy American Act), TAA (Trade American Act), or BABA (Build America, Buy America).

Project Name:	Type:

NV-W ORDERING GUIDE

Cat#

NV-W
(NV-W)

Light Dist.

Type 2
(T2)

Type 3
(T3)

Type 4
(T4)

of LEDs

16
(16L)

32
(32L)

Miliamps

400
(40)

530
(53)

700
(7)

1000
(1A) [5]

1050
(1) [6]

Kelvin

Amber 585-600nM
(AMBER) [1, 11, 14]

2700K, 70 CRI
(27K7) [7]

2700K, 80 CRI
(27K8) [1, 7, 13]

3000K, 70 CRI
(30K7) [7]

3000K, 80 CRI
(30K8) [1, 7, 13]

3500K, 80 CRI
(35K8)

4000K, 70 CRI
(40K7)

4000K, 80 CRI
(40K8) [1, 13]

5000K, 70 CRI
(50K7)

5000K, 80 CRI
(50K8) [1, 13]

Volts

120-277
(UNV)

347-480
(HV)

Mounting

Wall Mount
(WM)

Color

Bronze Textured
(BRZ)

White Textured
(WHT)

Smooth White Gloss
(SWT)

Silver Metallic
(SVR)

Black Textured
(BLK)

Smooth Black Gloss
(SBK)

Graphite Textured
(GPH)

Grey Textured
(GRY)

Green Textured
(GRN)

Hunter Green Textured
(HGN)

Custom
(CS)

Controls Options

Nema 7-Pin Receptacle
(PE7) [2]

Button Photocell
(PC) [3]

FSP-211 with
Motion Sensor / Photocell
(UNV Voltage)
*8' and Below
(FSP-8) [3]

*9'-20" Heights
(FSP-20) [3]

Options

Marine Grade Finish
(MGF)

Vanity Plate 22"x16"
(VP)

Housing Extension
(HE)

Surge Protector
(20KA)

Emergency Battery 4W
(EM4) [2, 3, 4]

Emergency Battery 8W
(EM8) [2, 3, 4]

Emergency Cold Pk Battery
14W
(EMCP) [2, 3, 4]

Black Hardware
(BH) [1]

Black Optic Frame
(BOF) [1]

Buy American Act
(BAA) [12]

Trade Agreement Act
(TAA) [12]

Build America
Buy American
(BABA) [12]

Custom Controls
Integration
(CCI) [10]

Dual Circuit
(2CT) [5, 15]

Lens Options

Glass Lens
(GL) [8, 15]

HAL Lens
(HAL) [9, 15]

NOTES:

1. Consult Factory for Lead Time.
2. Requires Housing Extension
3. Universal Voltage 120-277
4. All Emergency Battery Options Certified CA Title 20
5. 32L only
6. 16L only
7. 3000K or lower must be selected to meet International Dark Sky Association certification
8. Glass Lens: Low iron glass, fully tempered per ANSI C1047
9. HAL Lens: Yellow Polycarbonate Lens – less than 2% Blue Light Content
10. Please contact Factory for Custom Control Integration requests (nLight, NX, WaveLinx, Crestron, DMX/RDM, Synapse, Casambi, Dali II, Avi-On, or other control systems)
11. Turtle Safe
12. Consult factory for all BAA/TAA/BABA requests
13. Consult Factory for 90 CRI Requests
14. Not Available above 700mA
15. Contact Factory

PRODUCT SPECIFICATIONS

ELECTRICAL

- 120-277 Volts (UNV) or 347-480 Volts (HV)
- 0-10V dimming driver
- Driver power factor at maximum load is ≥ .95, THD maximum load is 15%
- LED Drivers Ambient Temp. Min is -40°C and Ambient Temp. Max ranges from 50°C to 55°C and, in some cases, even higher. Consult the factory for revalidation by providing the fixture catalog string before quoting and specifying it.
- All internal wiring UL certified for 600 VAC and 105°C
- All drivers, controls, and sensors housed in enclosed IP66 compartment
- CRI 70, 80, 90
- Color temperatures: 2700K, 3000K, 3500K, 4000K, 5000K

CONSTRUCTION

- Die Cast Aluminum
- Internal cooling fins
- Corrosion resistant external hardware
- One-piece silicone gasket ensures IP65 seal for electronics compartment
- Two-piece silicone Micro Optic system ensures IP67 level seal around each PCB
- Silicone Micro Optics: Recessed, full cutoff, vandal resistant and non-yellowing
- Dark Sky Approved

OPTIONS

- MARINE GRADE FINISH (MGF) - A multi-step process creating protective finishing coat against harsh environments. Chemically washed in a 5 stage cleaning system. Prebaked, Powder coated 3-5 mils of Zinc Rich Super Durable Polyester Primer. Oven Baked. Finished Powder Coating of Super Durable Polyester Powder Coat 3-5 mil thickness.
- VANITY PLATE (VP) - Optional Vanity Plate was designed to cover the unsightly remains on a wall where a larger HID wallpack was removed. The aluminum Vanity Plate will be painted to match the finish of the NV-W2, custom finishes are available, please consult factory. The standard Vanity Plate is 22"W x 16"H.
- 20KA Surge Protector (20KA) - protects the complete system against nominal surges of up to 20KA. Protection against power surges, storms and lightning strikes.
- EMERGENCY COLD PACK BATTERY (EMPC) - Emergency cold pack (-20oC minimum) battery system available in 14W output.
- Black Hardware (BH) - Black stainless steel hardware.
- Black Optic Frame (BOF) - Black optic frame. Standard is white.
- GLASS LENS (GL) - Low Iron Glass, fully tempered.
- High performance amber lens (HAL)

CONTROL OPTIONS

- FSP-211 (FSP-X)—Passive infrared (PIR) sensor providing multi-level control based on motion/daylight contribution.
- All control parameters adjustable via wireless configuration remote storing and transmitting sensor profiles.
- FSP-8 Mounting heights 8 feet and below
- FSP-20 mounting heights 9-20 feet
- Includes 5 dimming event cycles, 0-10V dimming with motion sensing, re-programmable in the field. Programmable remote must be purchased separately.
- FSIR-100 commissioning remote is required to change sensor settings. Please contact factory for ordering.
- Controls Agnostic: Please contact factory for your preferred controls option.
- NEMA 7-PIN RECEPTACLE (PE7)—An ANSI C136.41-2013 receptacle provides electrical and mechanical interconnection between photo control cell and luminaire. Dimming receptacle available two or four dimming contacts supports 0-10 VDC dimming methods or Digital Addressable Lighting Interface (DALI), providing reliable power interconnect.
- BUTTON PHOTOCELL–Dusk to dawn optional Button Photocell.

FINISH

- 3-5 mils electrostatic powder coat.
- NLS Lighting's standard high-quality finishes prevent corrosion, and protects against extreme environmental conditions.

WARRANTY

Five-year limited warranty for drivers and LEDs.

OPTICS

Silicone optics high thermal stability and light output provide higher powered LEDs with minimized lumen depreciation. UV stability with scratch resistance increases exterior application durability. Silicone optics do not yellow, crack or brittle over time.

LISTINGS

- Certified to UL 1598
- UL 8750
- CSA C22.2 No. 250.0
- DesignLights Consortium® (DLC)
- DesignLights Consortium Premium® (DLCP)
- IP65 Rated Fixture / IP67 Rated Optics
- IK10 Rated
- IDA Dark Sky Approved

BUY AMERICAN OPTION

While all of the NLS Lighting products listed in this document qualify for the Buy America(n) Act of 1933, we reserve the right to change our listings without notice.

The information provided above is for general informational purposes only. We encourage you to consult legal professionals for advice particular to your projects concerning BAA, TAA, BABA or Buy America.

Additional NLS Products that meet BAA, TAA standards can be found at the following link:

https://nlslighting.com/buy-american/

The information and specifications on this document are subject to change without any notification. All values are design, nominal, typical or prorated values when measured under internal and external laboratory conditions.

PRODUCT SPECIFICATIONS

LUMENS							
PART NUMBER	**T2**	**LM/W**	**T3**	**LM/W**	**T4**	**LM/W**	**WATTS**
NV-W-16L-40-27K7	2561	122	2591	123	2561	122	21
NV-W-16L-40-27K8	2398	114	2426	116	2398	114	21
NV-W-16L-40-30K8	2571	122	2601	124	2571	122	21
NV-W-16L-40-30K7	2769	132	2801	133	2769	132	21
NV-W-16L-40-35K8	2571	122	2601	124	2571	122	21
NV-W-16L-40-40K8	2769	132	2801	133	2769	132	21
NV-W-16L-40-40K7	2992	142	3027	144	2992	142	21
NV-W-16L-40-50K8	2769	132	2801	133	2769	132	21
NV-W-16L-40-50K7	2992	142	3027	144	2992	142	21
NV-W-16L-53-30K7	3544	122	3579	123	3544	122	29
NV-W-16L-53-40K7	3756	130	3794	131	3756	130	29
NV-W-16L-53-50K7	3756	130	3794	131	3756	130	29
NV-W-16L-7-30K7	4388	119	4432	120	4388	119	37
NV-W-16L-7-40K7	4651	126	4698	127	4651	126	37
NV-W-16L-7-50K7	4651	126	4698	127	4651	126	37
NV-W-16L-1-30K7	5970	107	6029	108	5970	107	56
NV-W-16L-1-40K7	6328	113	6391	114	6328	113	56
NV-W-16L-1-50K7	6328	113	6391	114	6328	113	56
NV-W-32L-53-30K7	X	X	X	X	6,821	126	54
NV-W-32L-7-30K7	9010	127	9100	128	9010	127	71
NV-W-32L-7-40K7	9550	135	9646	136	9550	135	71
NV-W-32L-7-50K7	9550	135	9646	136	9550	135	71
NV-W-32L-1A-30K7	10871	109	10983	110	10871	109	100
NV-W-32L-1A-40K7	11426	114	11544	115	11426	114	100
NV-W-32L-1A-50K7	11426	114	11544	115	11426	114	100
3000K or lower, with fixed mounting options only, must be selected to meet International Dark-Sky Association certification.							

EMERGENCY BATTERY BACK-UP LUMENS							
PART NUMBER	**T2**	**LM/W**	**T3**	**LM/W**	**T4**	**LM/W**	**WATTS**
EM4-30K7	520	130	524	131	516	129	4
EM4-40K7	544	136	548	137	540	135	4
EM4-50K7	560	140	564	141	556	139	4
EM8-30K7	1040	130	1048	131	1032	129	8
EM8-40K7	1088	136	1096	137	1080	135	8
EM8-50K7	1120	140	1128	141	1112	139	8
EM14-30K7	2080	130	2096	131	2064	129	16
EM14-40K7	2176	136	2192	137	2160	135	16
EM14-50K7	2240	140	2256	141	2224	139	16
EMCP-30K7	1820	130	1834	131	1806	129	14
EMCP-40K7	1904	136	1918	137	1890	135	14
EMCP-50K7	1960	140	1974	141	1946	139	14

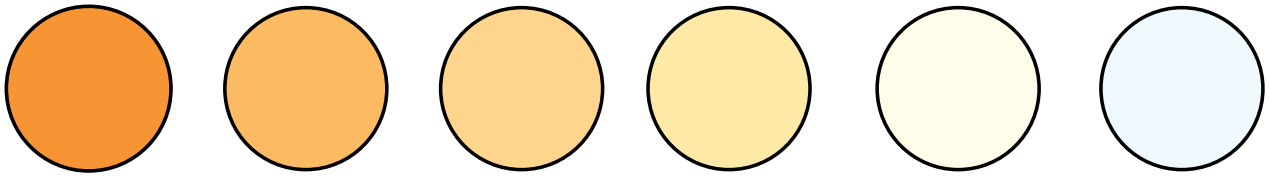
PRODUCT SPECIFICATIONS

BUG RATINGS BUG RATINGS

PART NUMBER	T2	T3	T4	WATTS
NV-W-16L-35-30K7	B1-U0-G1	B1-U0-G1	B1-U0-G1	21
NV-W-16L-35-40K7	B1-U0-G1	B1-U0-G1	B1-U0-G1	21
NV-W-16L-35-50K7	B1-U0-G1	B1-U0-G1	B1-U0-G1	21
NV-W-16L-53-30K7	B1-U0-G1	B1-U0-G1	B1-U0-G1	29
NV-W-16L-53-40K7	B1-U0-G1	B1-U0-G1	B1-U0-G1	29
NV-W-16L-53-50K7	B1-U0-G1	B1-U0-G1	B1-U0-G1	29
NV-W-16L-7-30K7	B1-U0-G1	B1-U0-G1	B1-U0-G1	37
NV-W-16L-7-40K7	B1-U0-G1	B1-U0-G1	B1-U0-G1	37
NV-W-16L-7-50K7	B1-U0-G1	B1-U0-G1	B1-U0-G1	37
NV-W-16L-1-30K7	B1-U0-G1	B1-U0-G2	B1-U0-G2	56
NV-W-16L-1-40K7	B1-U0-G1	B1-U0-G2	B1-U0-G2	56
NV-W-16L-1-50K7	B1-U0-G1	B1-U0-G2	B1-U0-G2	56
NV-W-32L-7-30K7	B1-U0-G2	B2-U0-G2	B2-U0-G2	71
NV-W-32L-7-40K7	B1-U0-G2	B2-U0-G2	B2-U0-G2	71
NV-W-32L-7-50K7	B1-U0-G2	B2-U0-G2	B2-U0-G2	71
NV-W-32L-1A-30K7	B2-U0-G2	B2-U0-G2	B2-U0-G2	100
NV-W-32L-1A-40K7	B2-U0-G2	B2-U0-G2	B2-U0-G2	100
NV-W-32L-1A-50K7	B2-U0-G2	B2-U0-G2	B2-U0-G2	100

Lumen Maintenance Data							
Ambient Temperature	**Drive Current**	**L90 Hours***	**L70 Hours****	**30,000 Hours***	**50,000 Hours***	**60,00 Hours***	**100,000 Hours****
25°C	Up to 700mA	58,000	173,000	95.7%	91.6%	89.6%	82.1%
	1050mA	48,000	143,000	94.3%	89.5%	87.2%	78.5%
*Reported extrapolations per IESNA TM-21 **Projected extrapolations per IESNA TM-21							

LED KELVIN RANGE



AMBER
585-600 nm

2700K 70 CRI

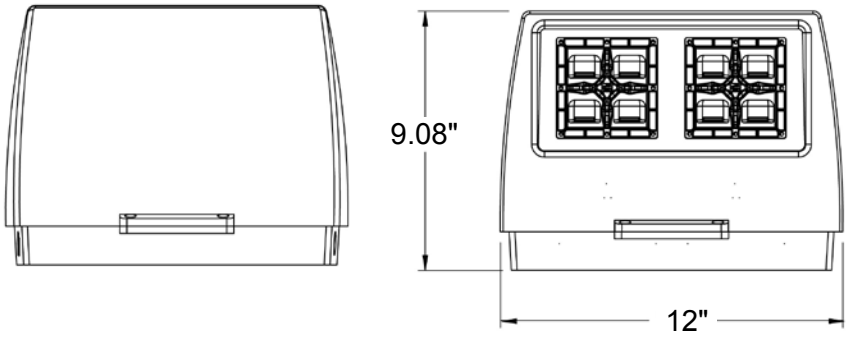
3000K 70 CRI

3500K 80 CRI

4000K 70 CRI

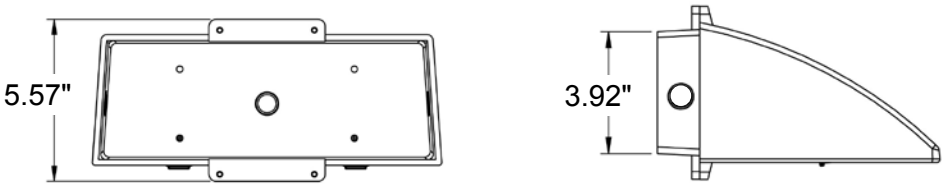
5000K 70 CRI

Color	Dominant or Peak Wavelength Range (nm)	
	Minimum	Maximum
Amber	585	600



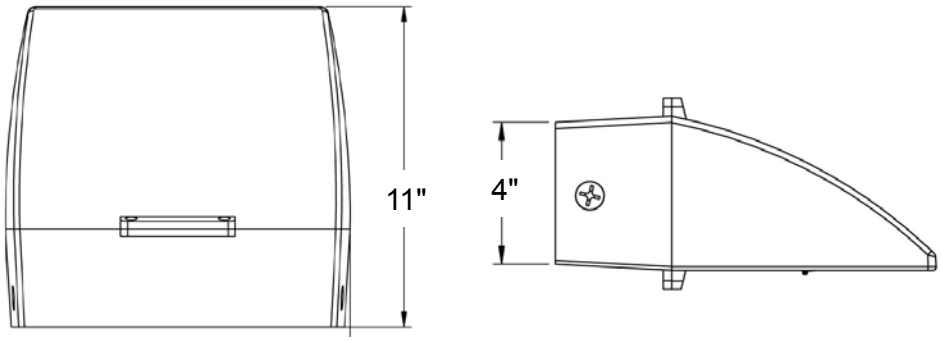
TOP VIEW

BOTTOM VIEW



WEIGHT: 9.1 LBS

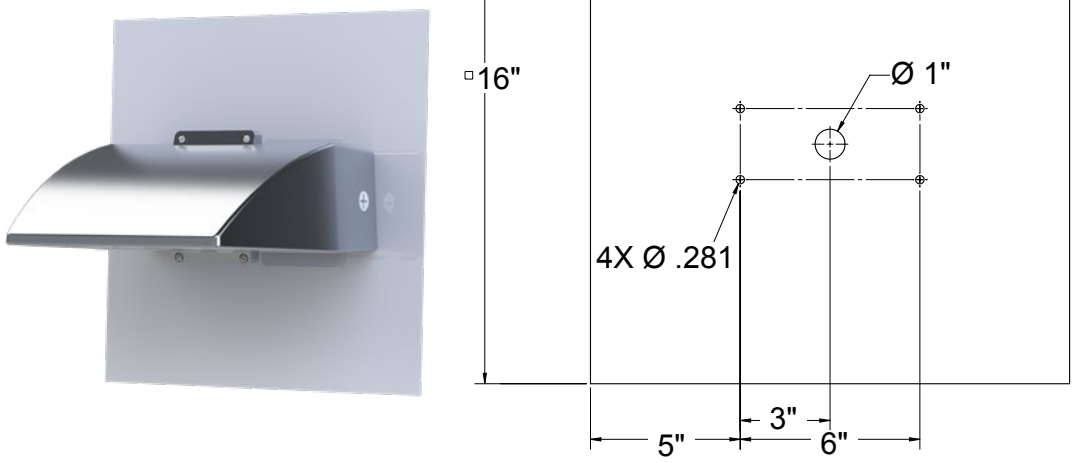
EMERGENCY BATTERY AND 7-PIN EXTENSION BOX DIMENSIONS



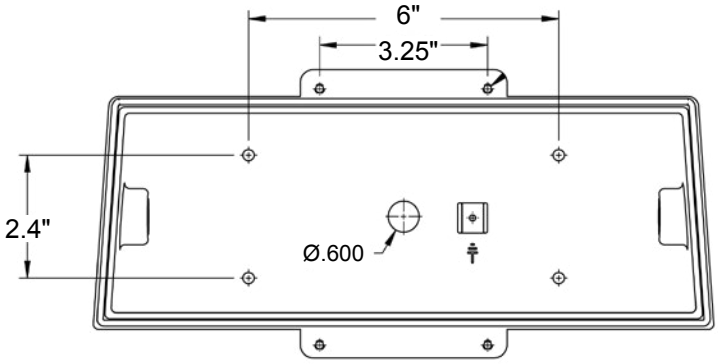
TOP VIEW

WEIGHT: 13.3 LBS

VANITY PLATE (VP)



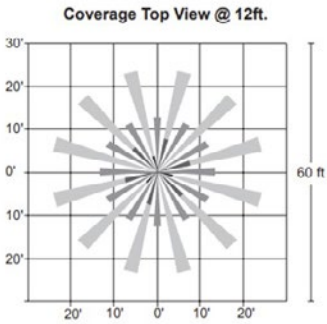
MOUNTING HOLE

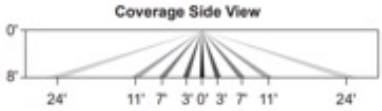


* 3 Conduit access points on either side or center back.

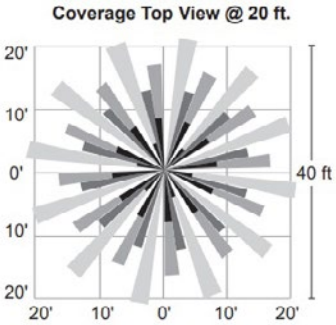
MOTION SENSOR PLACEMENT

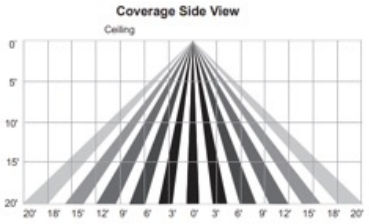
FSP-8





FSP-20





12 Mountfort Street
Portland, Maine 04101
www.woodardcurran.com

T 800.426.4262
T 207.774.2112
F 207.774.6635

Via UPS

January 30, 2025

Natalie Thomsen, Planning Coordinator
City of Auburn, Maine
60 Court Street
Auburn, Maine 04210

Re: Engine 2 Fire Station
Development Review Application – Response to City Comments

Dear Ms. Thomsen:

Thank you for facilitating the City staff review of the Development Review Application for the Engine 2 Fire Station project. We have received the comments you provided via email on January 13, 2025, from the City staff review of the application. We have addressed the City's comments and revised the application materials accordingly.

Enclosed with this letter the following Site Plan drawing sheets, which were revised to address City comments: G-0-001, C-0-103, C-0-104, C-0-105, C-0-106, C-0-202, C-99-904, C-99-905, C-99-906, C-99-907, and Site Lighting Plan. We have included three (3) full size copies (24"x36"), and ten (10) reduced size copies (11"x17") of the revised drawing sheets. Please note that the only revisions made to the detail sheets were the removal of the StormTech system details, which resulted in the remaining details being reorganized.

Below please find our responses to the City comments received. We have repeated the City comments as shown in **bold** text below, with our responses following in plain text.

1. **A landscaping plan is missing from the submission.**

   A Planting Plan has been provided with the revised submission, drawing C-0-106.

2. **Chapter 500 Stormwater requirements are not applicable for this project.**

   Comment is noted and has been taken into consideration for the stormwater management design.

3. **We recommend a review of groundwater infiltration, particularly focusing on the easterly uphill side of the site. Consider the addition of a curtain drain for groundwater management. Note that proprietary stormwater devices are not necessary.**

   In accordance with the Goetechnical Engineer's recommendations, underdrains will be installed beneath the paved areas in the rear of the site where cuts are proposed, and silty clay subgrades are anticipated. Underdrains will be designed and installed as MaineDOT Type C Underdrains. A foundation drain will also be provided around the

perimeter of the building. The StormTech detention system that was on the original application drawings has been removed, as mitigation of quantity or quality of stormwater is not required by the City or MaineDEP stormwater standards for the project.

4. **The plans should explicitly include an oil and water separator for the interior drain, which is mentioned in the narrative but not shown on the plans.**

   An oil water separator has been added to the Utility Plan (noted as OWS-1 on drawing C-0-105).

5. **There are currently two sewer manholes depicted on the plans. Would it be feasible to consolidate the inverts into a single manhole?**

   There are two sanitary discharges from the building. One is for the floor drains within the apparatus bay. The other is from the kitchen and bathroom plumbing. Due to the plumbing design interior to the building, and need for an external oil-water separator for the apparatus bay floor drain, and the oil-water separators prefabricated pipe connection flange locations, it is not possible to consolidate the inverts into a single manhole.

We trust that the information enclosed is complete and to your satisfaction. We look forward to presenting the Project at the upcoming Planning Board meeting. If you have any questions regarding these requests, please do not hesitate to contact me at (207) 558-3707 or via email at csuhr@woodardcurran.com.

Sincerely,

Woodard & Curran, Inc.

Caitlin Suhr, PE
Project Manager

cc: Dan Goyette, City of Auburn
John Blais, City of Auburn
Chief Robert Chase, Auburn Fire Department

PN: 0233981.13

12 Mountfort Street
Portland, Maine 04101
www.woodardcurran.com

T 800.426.4262
T 207.774.2112
F 207.774.6635

Via UPS

January 30, 2025

Natalie Thomsen, Planning Coordinator
City of Auburn, Maine
60 Court Street
Auburn, Maine 04210

Re: Engine 2 Fire Station Development Review Application
Waiver Requests

Dear Ms. Thomsen:

On behalf of the City of Auburn (the Applicant), Woodard & Curran (W&C) is requesting the following waivers be granted for the Engine 2 project (the Project) as part of the Development Review by the City of Auburn. The project is located at 180 South Main Street, within the T4.2B Traditional Neighborhood zoning district and is subject to the Form Based Code of the City of Auburn Zoning Ordinance.

Below is a summary of the waivers being requested, including references to the specific section from the City of Auburn Zoning Ordinance, and reasons for the request. The waivers are requested in accordance with the waiver provision of Section 60-558(c). The Zoning Ordinance requirements are presented in **bold** text, and the Applicants' reasoning for the waiver request is provided in plain text.

1. **Waiver from Section 60-548B.1. Building placement and configuration. Front setback for principal structure shall be 25 feet maximum.**

   The design of the new Engine 2 facility includes a building setback greater than 25 feet. This adjustment is necessary for several key operational reasons, all of which are integral to the safety and efficiency of the station and, by extension, to the community it serves.

   The additional setback will allow for a dedicated visitor parking area, adequate space for emergency apparatus drive aisles and turning movements, and room for routine testing and maintenance of firefighting equipment. More critically, the additional setback is required to maintain the operation of the existing Engine 2 Fire Station throughout the construction of the new facility. This continuity of operations is essential to ensure that emergency response times are not disrupted during construction, which is a crucial factor in preserving public safety.

   Enclosed, please find a letter from Fire Chief Robert Chase that further details how these operational requirements prevent the project from complying with the 25-foot setback maximum.

In accordance with Section 60-548B.2 of the City's zoning code, the new station will have a ground story finished floor elevation approximately four feet above the front yard elevation. Furthermore, the design of the building complies with architectural guidelines, with no blank walls exceeding 10 linear feet along the ground floor façade, and features that respect the neighborhood's character. The placement of the building on the site has been carefully considered to enhance safety for both vehicular and pedestrian movements, both within the site and in relation to the surrounding areas.

2. **Waiver from Sec. 60-548B.2. Building frontages. Windows and doors shall comprise a minimum of 40% and maximum of 90% coverage of the total ground story frontage façade for commercial developments.**

   The building design includes 34% window and door coverage, which is below the required 40% for commercial developments, but greater than the minimum requirement of 25% for residential uses. The building's design eliminates windows from storage and other support spaces, to maximize usable space while reducing energy loss. Fewer windows in these areas help to conserve energy and lower long-term operational costs. While the 40% window and door coverage requirement is standard for commercial developments, the proposed design takes into account the primary function of the facility, which is a fire station with dormitories. The operational efficiency and energy conservation needs of the building are paramount, and the proposed coverage of 34% strikes an appropriate balance between these needs and the building's overall functionality.

3. **Waiver from Section 60-548B.3. External elements. Parking for commercial developments shall be located to rear of the property to the greatest extent possible. Parking on a side yard is limited to no more than 60 feet wide or 40% of the lot width. Screening and/or street wall is required for parking areas along a street.**

   The design of the new facility includes two dedicated parking areas, which have been strategically placed to balance the operational needs of the Fire Department with the preservation of natural features and neighborhood aesthetics.

   The first parking area, located to the west of the building, includes seven spaces for Fire Department staff. This area is accessed via the emergency vehicle apparatus drive aisle, which is essential for ensuring that fire response vehicles and personnel can move efficiently within the site.

   The second parking area, located at the front of the building, provides three spaces for public use, including one accessible space. These spaces are accessed via a separate, dedicated drive aisle to ensure safety and efficient flow of both public and emergency vehicle traffic. The public parking spaces have been located at the front of the building, consistent with existing conditions, to provide close proximity to the public entrance to the station, and to comply with Americans with Disabilities Act (ADA) requirements.

Additionally, the layout of the parking areas has been designed to minimize environmental impacts. Locating the parking areas on the front and side of the building helps to avoid further encroachment upon wetlands located elsewhere on the site. To further mitigate the visual impact of the parking areas, landscaping and screening, as shown on the attached Planting Plan, will be provided.

4. **Waiver from Section 60-801. Access Management and Number of driveways per lot. Minimum spacing of 150 feet for curb cut and driveway spacing; and one two-way access onto a single roadway.**

   The design of the new facility includes two separate curb cuts and drive aisles to ensure safe and efficient movement of emergency vehicles, as well as to effectively separate public access from staff and emergency vehicle traffic. This separation is critical to maintaining both operational efficiency and safety on the site.

   The proposed curb cuts are less than 150 feet apart, in line with existing conditions for the property. Due to the limited frontage of the site, it is not feasible to achieve the required separation between curb cuts while also meeting the operational needs of the Fire Department. Given the nature of the site and the need to maintain clear traffic flow for both emergency and public vehicles, this configuration ensures the safety of all users. To further enhance safety and control traffic flow, stop signs have been incorporated at each of the drive aisle curb cuts.

5. **Waiver from Section 60-548B.3 and Section 60-607. External elements and general provisions and design standards. Driveways shall be a maximum 20-foot width.**

   The design includes two curb cuts along South Main Street: one for emergency vehicle access and the other for public access. The proposed curb cuts are approximately 34 feet and 24 feet wide, respectively. These widths are necessary to ensure safe and efficient operations for both emergency vehicles and public access.

   The wider curb cuts are specifically designed to accommodate the movement of emergency apparatus in and out of the apparatus drive aisle, as well as to facilitate passenger vehicle access to the visitor parking area. Given the nature of the station's operations, these dimensions are critical to maintain the necessary clearance for fire trucks and other emergency vehicles, which require larger turning radii and more space to maneuver safely.

   According to Section 60-607, curb cut widths may be increased up to a maximum of 44 feet on arterial roads, as determined by the city engineering department or the state department of transportation. South Main Street is classified by MaineDOT as a Major Collector, and the portion of South Main Street where the curb cuts are proposed may be considered a minor arterial highway under Section 60-2 of the Zoning Ordinance. This designation reflects that the roadway serves moderate-length trips and provides

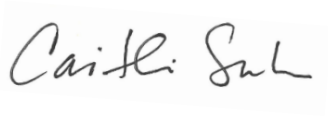
continuity between geographic areas, but does not penetrate neighborhoods, making it suitable for the proposed curb cut widths.

Given these conditions, the requested waiver for the wider curb cuts is essential to ensure both operational efficiency and safety, particularly for the movement of emergency vehicles, while also accommodating public access without compromising the flow of traffic.

We trust that the information enclosed is complete and to your satisfaction. We look forward to presenting the Project at the upcoming Planning Board meeting. If you have any questions regarding these requests, please do not hesitate to contact me at (207) 558-3707 or via email at csuhr@woodardcurran.com.

Sincerely,

Woodard & Curran, Inc.



Caitlin Suhr, PE
Project Manager

cc: Dan Goyette, City of Auburn
John Blais, City of Auburn
Chief Robert Chase, Auburn Fire Department

PN: 0233981.13

Auburn Fire Department
Robert Chase | Fire Chief
550 Minot Avenue | Auburn, Maine 04210
www.auburnmaine.gov | 207.333.6633

January 30, 2025

Auburn Planning Board
60 Court Street
Auburn, Me 04210

RE: Request for Waiver

Members of the Auburn Planning Board,

I am writing to formally request a waiver of the 25' setback requirement for the Engine 2 Station project. After a thorough evaluation of potential alternative sites, we have concluded that none of the options would meet our needs without significantly compromising response times and, ultimately, public safety.

The current site remains the most suitable location to maintain service and response capabilities. We've explored alternative building sites but were unable to find another viable option. We also considered temporarily relocating our fire department operations, but failed to identify an appropriate location to do so. Given this, the best course of action is to proceed with building on the existing site while keeping the current station operational. But by building behind the existing station, it will result in a setback that exceeds the standard 25'.

It's important to note that as a fire department, we are unique in that we require sufficient space in front of our stations for daily truck checks, maintenance, and staging of mutual aid trucks during larger incidents. Fire Engines typically measure 35-40 feet in length, and having adequate space for apparatus to park is critical to ensuring efficient response times.

Without the waiver, we would be forced to restart the project from the design phase, which would not only delay the project, but would also potentially disrupt operations if relocation is necessary – relocation that we have determined is not feasible. I believe that a delay would significantly hinder our ability to provide consistent and timely service to the residents of our city.

I support granting this waiver because it's in the best interest of public safety and will allow the Auburn Fire Department to continue to provide the high level of service our community deserves. Thank you for your consideration in this matter.

Sincerely,

Robert Chase

Robert Chase
Fire Chief

CITY OF AUBURN
180 SOUTH MAIN STREET
AUBURN, MAINE 04210

AUBURN ENGINE 2

SITE PLAN REVIEW NOT FOR CONSTRUCTION

JANUARY 2025

PROJECT LOCATION MAP

SHEET INDEX		
GENERAL		LAST ISSUE
G-0-001	COVER SHEET	1/29/2025
CIVIL		
C-0-001	GENERAL NOTES, LEGEND, AND ABBREVIATIONS	12/20/2024
C-0-101	EXISTING CONDITIONS PLAN	12/20/2024
C-0-102	SITE PREPARATION AND DEMOLITION PLAN	12/20/2024
C-0-103	LAYOUT AND MATERIALS PLANS	1/29/2025
C-0-104	GRADING AND DRAINAGE PLAN	1/29/2025
C-0-105	UTILITY PLAN	1/29/2025
C-0-106	PLANTING PLAN	1/29/2025
C-0-201	APPARATUS DRIVE AISLES AND PARKING ENTRANCE PROFILES	12/20/2024
C-0-202	STORM DRAIN PROFILE	1/29/2025
C-99-901	DETAILS - 1	12/20/2024
C-99-902	DETAILS - 2	12/20/2024
C-99-903	DETAILS - 3	12/20/2024
C-99-904	DETAILS - 4	1/29/2025
C-99-905	DETAILS - 5	1/29/2025
C-99-906	DETAILS - 6	1/29/2025
C-99-907	DETAILS - 7	1/29/2025
ARCHITECTURAL		
A2.1	FIRST FLOOR PLAN	12/20/2024
A2.2	MEZZANINE FLOOR PLAN	12/20/2024
A2.3	ROOF PLAN	12/20/2024
A3.1	BUILDING ELEVATIONS	12/20/2024
SITE LIGHTING		
CHARRON INC., SITE LIGHTING PLAN		1/21/2025

Surveyor
Main-Land Development Consultants, Inc.
69 Main St.
Livermore Falls, ME 04254

Geotechnical Engineering
S.W. Cole Engineering, Inc.
286 Portland Road
Gray, ME 04039

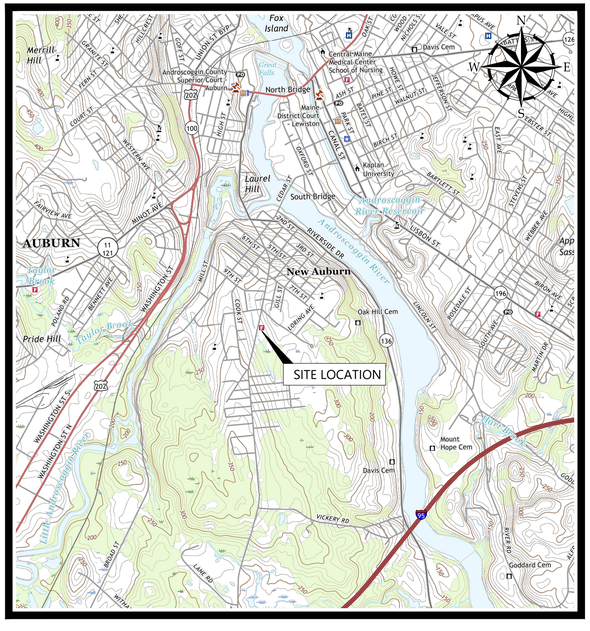
Civil
Woodard & Curran, Inc.
12 Mountfort Street
Portland, ME 04101

Architect
Simons Architects
75 York Street
Portland, ME 04101

Architect
Context Architecture
65 Franklin Street
Boston, MA 02110

Structural
Thornton Tomasetti
14 York Street, Suite 201
Portland, ME 04101

MEP
Allied Engineering
A Salas O'Brien Company
160 Veranda Street
Portland, ME 04103



SITE LOCATION MAP

SOURCE: USGS TOPO QUADRANGLE

Woodard & Curran
12 Mountfort Street
Portland, Maine 04101
800.426.4262 | www.woodardcurran.com

simons architects
designed for human potential

Allied Engineering
A Salas O'Brien Company
160 Veranda Street
Portland, Maine 04103
P: 207.221.2260
F: 207.221.2266

context ARCHITECTURE

Thornton Tomasetti

PE SEAL:

SITE PLAN REVIEW NOT FOR CONSTRUCTION

CLIENT INFO:

CITY OF AUBURN
180 SOUTH MAIN STREET
AUBURN, MAINE 04210

AUBURN ENGINE 2

REV	MM/DD/YY	DESCRIPTION
1	1/29/2025	RESPONSE TO CITY COMMENTS

JOB NO:	233981.13
DATE:	JANUARY 2025
SCALE:	AS NOTED
DESIGNED BY:	RA
DRAWN BY:	JBC
CHECKED BY:	CGS
FILENAME:	233981.13 G-0-001.dwg

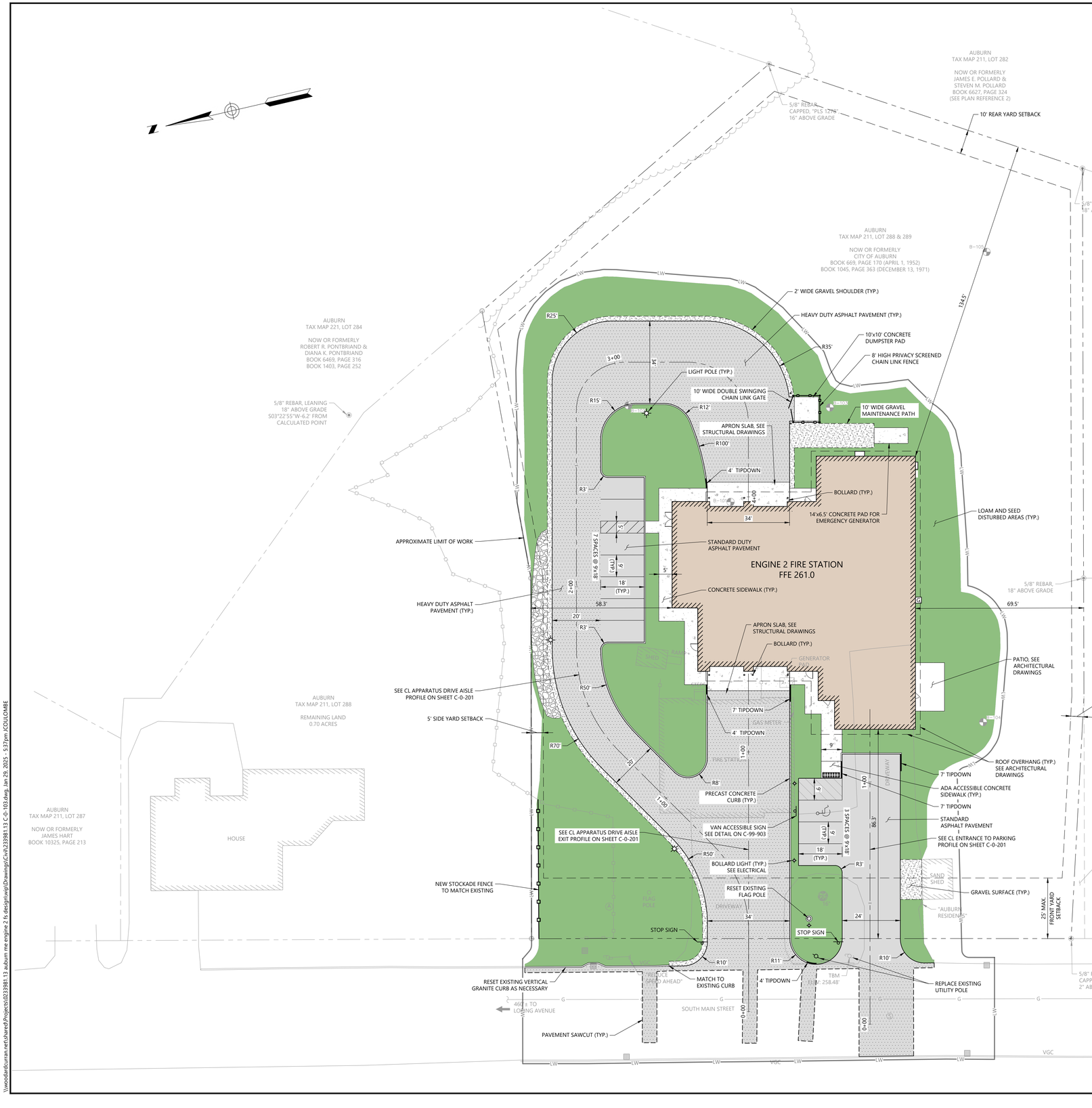
DRAWING TITLE:

GENERAL
COVER SHEET

DRAWING NO:

G-0-001

24x36



ZONING TABLE	
LOCATION:	180 S MAIN ST, AUBURN, ME PARCEL ID: 211-289
ZONE:	T-4.2b TRADITIONAL DOWNTOWN DEVELOPMENT
PRIMARY EXISTING STRUCTURE PRINCIPAL USE:	PUBLIC SAFETY SERVICES[1]
PRIMARY PROPOSED STRUCTURE PRINCIPAL USE:	PUBLIC SAFETY SERVICES[1]

REQUIREMENTS[2]

ITEM	REQUIRED	EXISTING	PROPOSED
LOT AREA (AC)	-	1.75	-
MAXIMUM BUILDING LOT COVERAGE (%)[3]	70	7	12
MINIMUM USEABLE OPEN SPACE (%)	10	>10	11
MAXIMUM PRINCIPAL FRONT YARD (FT)	25	50±	86±
MINIMUM SIDE YARD (FT)	5	86±	58±
MINIMUM REAR YARD (FT)	10	>10	134±
MAXIMUM LOT WIDTH (FT)	120	>120	>120
MAXIMUM BUILDING WIDTH (FT)	110	55.6±	100±
MINIMUM BUILDING HEIGHT	1 STORY	1 STORY	2 STORY
MAXIMUM BUILDING HEIGHT (FT)	3 STORY	1 STORY	2 STORY
PARKING SPACES[4]	NONE	6±	10

[1] - EXISTING INDICATED IN THIS TABLE USE IS BASED ON THE USE INDICATED FOR PARCEL 211-289 ON THE AUBURN MAINE ADVANCED PUBLIC PARCEL VIEWER GIS. THE PROPOSED USE WILL NOT CHANGE. LAND USE DESIGNATIONS FOR THIS SITE WOULD BE CATEGORIZED AS "PUBLIC SAFETY SERVICES" PER THE CITY OF AUBURN'S ORDINANCES, SECTION 60-554. - FORM BASED CODE USE AND PARKING MATRIX.

[2] - REQUIREMENTS ARE BASED ON CHAPTER 60 OF THE CITY OF AUBURN'S CODE OF ORDINANCES FOR THE T-4.2 DISTRICT.

[3] - EXISTING LOT COVERAGE AREAS ARE BASED ON INFORMATION PROVIDED FOR PARCEL 211-289 ON THE AUBURN MAINE ADVANCED PUBLIC PARCEL VIEWER GIS.

[4] - PARKING REQUIREMENTS ARE BASED ON THE CITY OF AUBURN ORDINANCES, SEC. 60-554. - FORM BASED CODE USE AND PARKING MATRIX

GENERAL NOTES:

1. EXISTING FIRE STATION TO REMAIN IN OPERATION DURING CONSTRUCTION OF NEW BUILDING. CONTRACTOR SHALL SUBMIT A CONSTRUCTION PHASING PLAN PRIOR TO CONSTRUCTION FOR ENGINEER AND CITY REVIEW.

20' 0 20' 40'

BAR SCALE
1" = 20'
CHECK GRAPHIC SCALE BEFORE USING

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Thornton Tomasetti

PE SEAL:

SITE PLAN REVIEW
NOT FOR CONSTRUCTION

CLIENT INFO:

CITY OF AUBURN
180 SOUTH MAIN STREET
AUBURN, MAINE 04210

AUBURN ENGINE 2

REV	MM/DD/YY	DESCRIPTION
1	1/29/2025	RESPONSE TO CITY COMMENTS

JOB NO:	233981.13
DATE:	JANUARY 2025
SCALE:	AS NOTED
DESIGNED BY:	RA
DRAWN BY:	JBC
CHECKED BY:	CGS
FILENAME:	233981.13 C-0-103.dwg

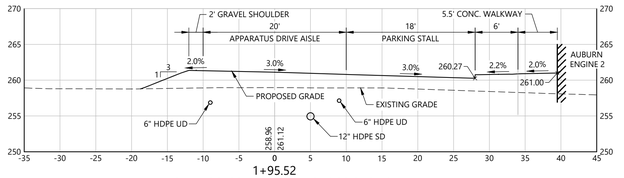
DRAWING TITLE:

CIVIL
LAYOUT AND MATERIALS PLANS

DRAWING NO:

C-0-103

\\woodardcurran.net\shared\Projects\02\233981.13 auburn me engine 2 fs design\wip\Drawings\Civil\233981.13 C-0-103.dwg, Jan 29, 2025 - 5:37pm JCOULOMBE



1+95.52

TYPICAL ACCESS DRIVEWAY CROSS SECTION

STRUCTURE TABLE				
NAME	DIA.	RIM	INV IN/SIZE (FROM)	INV OUT/SIZE (TO)
CB-1	4'	257.50		253.62/18"HDPE (SE)
CB-2	4'	257.09	255.52/6"HDPE (E)	254.23/12"HDPE (NE)
CB-3	4'	260.43	256.65/6"HDPE (SW)	256.55/12"HDPE (NE)
CB-4	4'	260.23	255.81/6"HDPE (S) 256.88/6"HDPE (N)	255.31/12"HDPE (NW)
CB-5	4'	259.74		254.96/12"HDPE (N)
CB-6	4'	259.88	256.26/6"HDPE (N) 256.26/6"HDPE (S)	255.07/12"HDPE (NW)
DMH-1	6'	258.07	253.44/12"HDPE (SW) 254.43/6"HDPE (S) 253.43/18"HDPE (NW) 253.52/12"HDPE (E)	253.42/18"HDPE (W)
DMH-2	5'	260.71	256.15/12"HDPE (SW) 254.23/12"HDPE (E) 255.00/12"HDPE (SE) 256.60/6"HDPE (N)	254.23/12"HDPE (W)
DMH-3	4'	260.37	254.78/12"HDPE (SE) 254.78/12"HDPE (S)	254.68/12"HDPE (W)

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SITE PLAN REVIEW
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CLIENT INFO:

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AUBURN, MAINE 04210

AUBURN ENGINE 2

REV	MM/DD/YY	DESCRIPTION
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CHECKED BY:	CGS
FILENAME:	233981.13 C-0-104.dwg

DRAWING TITLE:

CIVIL
GRADING AND DRAINAGE PLAN

DRAWING NO:

C-0-104

20' 0 20' 40'

BAR SCALE
1" = 20'
CHECK GRAPHIC SCALE BEFORE USING

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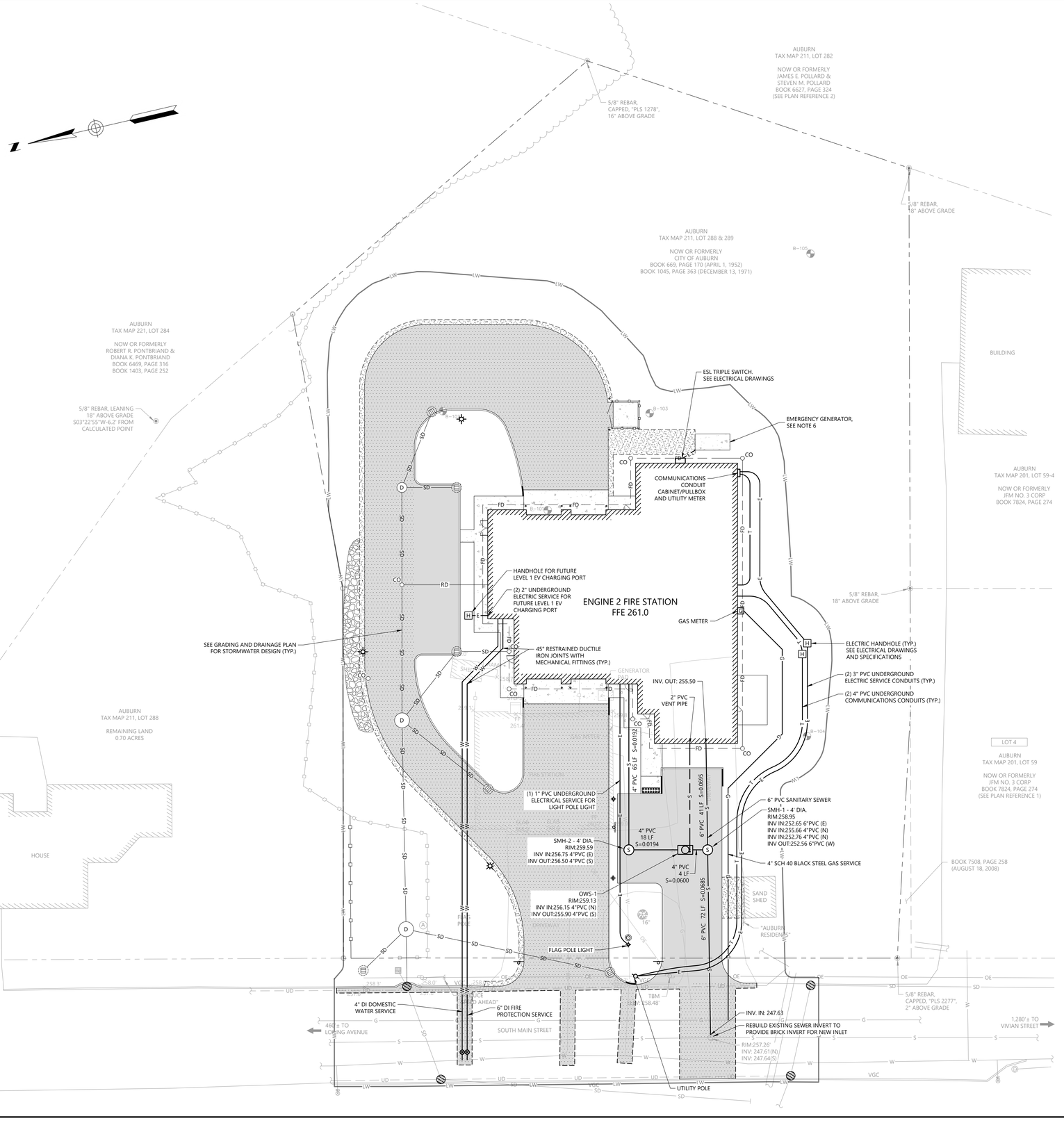
PLAN GENERAL NOTES

1. SIZE AND LOCATION OF PROPOSED UTILITIES SUBJECT TO CHANGE BASED ON FURTHER DESIGN AND COORDINATION WITH MEP ENGINEER.
2. REFER TO DRAWING C-0-104 FOR INFORMATION ON PROPOSED STORMWATER SYSTEM.
3. SIZE AND LOCATION OF TRANSFORMER AND GENERATOR PAD ARE SCHEMATIC AND SUBJECT TO CHANGE BASED ON FURTHER COORDINATION WITH MEP ENGINEER AND CMP.
4. ALLOWANCE SHALL BE CARRIED FOR SITE LIGHTING.
5. INSTALL NEW POLE MOUNTED TRANSFORMER AND SECONDARY RISER ON CMP POLE #28 AS DESCRIBED IN ELECTRICAL ENGINEERING SCHEMATIC DESIGN NARRATIVE.
6. EMERGENCY GENERATOR SHALL BE DIESEL WITH A SELF-CONTAINED BELLY-TANK, NO GAS. REFER TO MECHANICAL DRAWINGS.
7. THE EXISTING FIRE STATION SANITARY SEWER SERVICE AND TIE-IN LOCATION ARE UNKNOWN. THE CONTRACTOR SHALL CARRY AN ALLOWANCE FOR CONSTRUCTING A TEMPORARY 6" PVC SANITARY SEWER SERVICE AND CONNECTION AT THE EXISTING SEWER MAIN IN S MAIN STREET. THE CONTRACTOR SHALL VERIFY THE LOCATION OF THE EXISTING SEWER AND CONFIRM THERE ARE NO CONFLICTS WITH PROPOSED WORK PRIOR TO CONSTRUCTION OR THE PROCUREMENT OF CONSTRUCTION MATERIALS.



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180 SOUTH MAIN STREET
AUBURN, MAINE 04210

AUBURN ENGINE 2

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CHECKED BY:	CGS
FILENAME:	233981.13 C-0-105.dwg

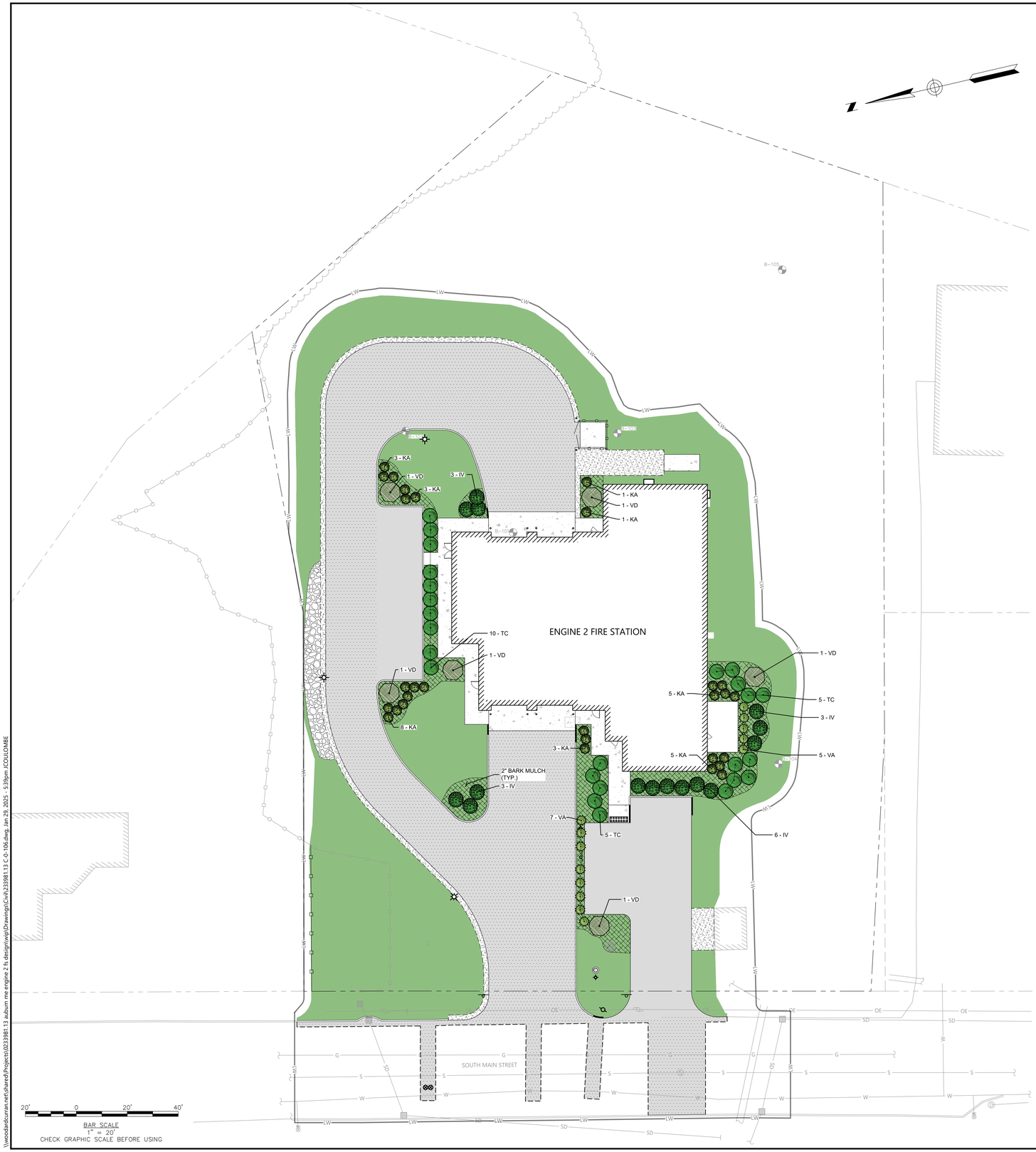
DRAWING TITLE:

CIVIL
UTILITY PLAN

DRAWING NO:

C-0-105

24x36



PLANT SCHEDULE			
CODE	COMMON / BOTANICAL NAME	SIZE	QTY
SHRUBS			
IV	WINTERBERRY / ILEX VERTICILLATA	3 GAL.	15
KA	SHEEP LAUREL / KALMIA ANGUSTIFOLIA	1 GAL.	29
TC	CANADA YEW / TAXUS CANADENSIS	5 GAL.	25
VA	MAPLELEAF VIBURNUM / VIBURNUM ACERIFOLIUM	3 GAL.	13
VD	ARROWWOOD VIBURNUM / VIBURNUM DENTATUM	3 GAL.	6

PLANTING NOTES:

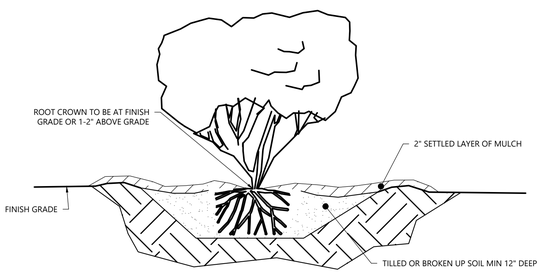
1. THE PLANTING INSTALLATION SHALL BE OVERSEEN BY OWNER'S REPRESENTATIVE.
2. ALL PLANT MATERIAL SHALL CONFORM TO "THE AMERICAN STANDARD FOR NURSERY STOCK", PUBLISHED BY AMERICANHORT (WWW.AMERICANHORT.ORG).
3. SUBSTITUTIONS OF PLANT SPECIES SHALL BE A PLANT OF EQUIVALENT OVERALL FORM, HEIGHT AND BRANCHING HABIT, FLOWER, LEAF AND FRUIT, COLOR AND TIME OF BLOOM, AS APPROVED OF BY OWNER'S REPRESENTATIVE.
4. PLANTING DEMOLITION DEBRIS, GARBAGE, LUMPS OF CONCRETE, STEEL AND OTHER MATERIALS DELETERIOUS TO PLANT'S HEALTH AS DETERMINED BY PROJECT ENGINEER SHALL BE REMOVED FROM ALL PLANTING AREAS.
5. NO PLANTING TO BE INSTALLED BEFORE ACCEPTANCE OF ROUGH GRADING.
6. TOTAL QUANTITY OF PLANTS FOR EACH AREA TO BE AVAILABLE ON SITE AT THE TIME OF PLANTING FOR FIELD LAYOUT BY OWNER'S REPRESENTATIVE. NO PARTIAL LAYOUT AND PLANTING OF AREAS WILL BE ACCEPTABLE.
7. LOOSE OR CRACKED ROOT BALLS SHALL BE REJECTED AND REPLACED.
8. FOR CONTAINER PLANTS, REMOVE CONTAINER AND SCARIFY EDGES OF ROOT BALL 1/2" DEEP IN A MINIMUM OF FOUR LOCATIONS.
9. WATER PLANTS THOROUGHLY AFTER INSTALLATION, A MINIMUM OF TWICE WITHIN THE FIRST 24 HOURS.

PLANTING INSTALLATION:

1. PLANT SPACING SHALL BE FOLLOWED AS NOTED IN THE PROJECT PLANT SCEDULE.
2. PLANTING DEPTH SHALL BE DONE IN ACCORDANCE WITH DETAIL HEREON.
3. QUICK RELEASE FERTILIZER SHOULD BE MIXED WITH BACKFILL SOIL AND PLACED IN HOLE PRIOR TO PLANTING.
4. PLANTING SOILS FOR NATIVE PLANTS TO CONSIST OF SITE SOILS MIXED WITH NEW TOP SOIL.
5. 2" LAYER OF BARK MULCH SHOULD BE PLACED AROUND BASE OF PLANTS FOLLOWING PLANTING AND BACKFILLING. MULCH SHOULD NOT BE PLACED DIRECTLY UP AGAINST THE TRUNK, STEMS OR FOLIAGE, TO AVOID DAMAGING AND/OR SUFFOCATING THE PLANTINGS.

PLANTING MAINTENANCE:

1. SHRUB ESTABLISHMENT IN ZONE 5 WILL REQUIRE REGULAR IRRIGATION THROUGH THE FIRST GROWING SEASON FOR UP TO 6 MONTHS.
2. SHRUBS NEED TO BE REGULARLY IRRIGATED UNDER A LANDSCAPE MAINTENANCE PROGRAM THROUGH THE ENTIRE ESTABLISHMENT PERIOD, ESPECIALLY IN PERIODS OF DROUGHT FOR PROPER ROOT ESTABLISHMENT.
3. 6 MONTH ESTABLISHMENT IRRIGATION: SHRUB SHALL BE IRRIGATED DAILY FOR THE FIRST 2 WEEKS FOLLOWING INSTALLATION, EVERY OTHER DAY FOR 2 MONTHS; WEEKLY FOR A PERIOD OF 6 MONTHS UNDER LANDSCAPE WARRANTY.
4. ESTABLISHMENT IRRIGATION AMOUNT: 2-3 GALLONS PER PLANT PER 1" OF STEM OR TRUNK DIAMETER. IRRIGATE BY HAND OR WITH TEMPORARY DRIP IRRIGATION DURING ESTABLISHMENT PERIOD.
5. REGULAR MAINTENANCE & IRRIGATION FOLLOWING ESTABLISHMENT PERIOD: NATIVE SHRUBS DO NOT REQUIRE ADDITIONAL FERTILIZATION, MECHANICAL IRRIGATION OR OTHER SPECIALIZED CARE IF REGULAR IRRIGATION AND MAINTENANCE WAS FOLLOWED FOR 6 MONTH ESTABLISHMENT.
6. SHRUBS TO BE IMMEDIATELY IRRIGATED. APPLY A VOLUME OF WATER THAT IS 1/3 THE VOLUME OF THE CONTAINER SIZE AT PLANTING.



NOTES:

1. DIG PLANTING HOLE 2X THE WIDTH OF THE ROOT BALL OR CONTAINER.
2. SET THE TOP OF THE ROOT BALL LEVEL WITH THE SOIL SURFACE, OR 1-2" ABOVE IF THE SOIL IS PRONE TO SETTLING.
3. IF CONTAINER GROWN PLANT, GENTLY SLIDE PLANT OUT OF CONTAINER. DISTURB THE ROOTS.
4. IF B&B PLANT, REMOVE BURLAP FROM THE TOP 12 INCHES OF THE ROOTBALL, WITHOUT DISTURBING THE ROOTBALL. REMOVE ALL CORD FROM THE TRUNK. REMOVE BURLAP AND WIRE BASKET (IF PRESENT) FROM THE ROOT BALL.
5. BACK FILL THE PLANTING HOLE WITH EXCAVATED NATIVE SOIL, BROKEN UP OR TILLED. WATER TO REMOVE AIR POCKETS. DO NOT ADD AMENDMENTS.
6. PLACE BARK MULCH ON THE SURFACE TO A (SETTLED) DEPTH OF 2 INCHES.

SHRUB PLANTING:

NOT TO SCALE

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AUBURN ENGINE 2

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DRAWING TITLE:
CIVIL
PLANTING PLAN

DRAWING NO:
C-0-106

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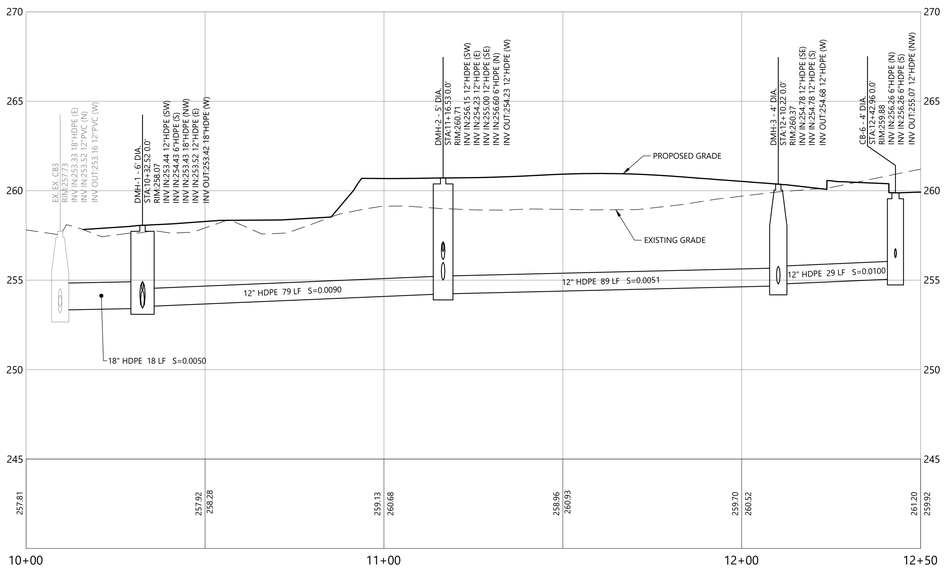
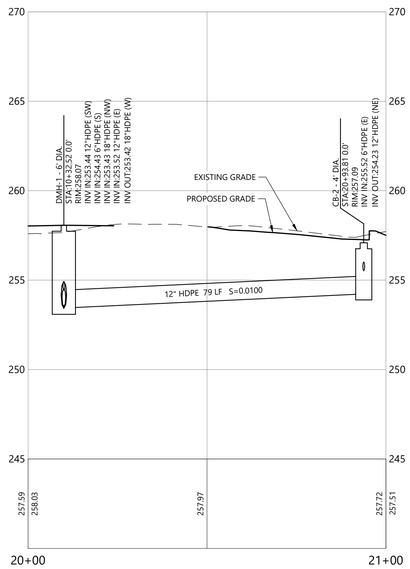


PROFILE STA. 10+00 TO STA. 12+50

HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 4'



PROFILE STA. 20+00 TO STA. 21+00

HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 4'

20' 0 20' 40'

BAR SCALE
1" = 20'
CHECK GRAPHIC SCALE BEFORE USING

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CHECKED BY:	CGS
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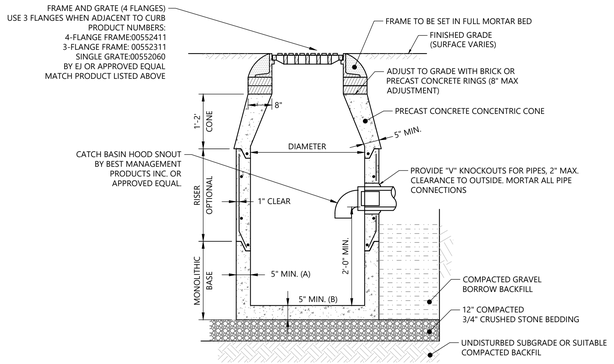
DRAWING TITLE:
CIVIL
STORM DRAIN PROFILE

DRAWING NO:
C-0-202

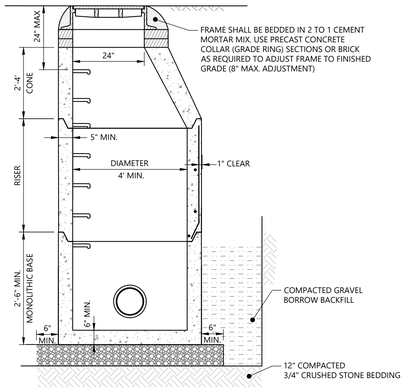


NOTES:

1. PRECAST CONCRETE STRUCTURES AND CASTINGS SHALL BE SUITABLE FOR HS-20 LOADINGS.
2. PRECAST CONCRETE STRUCTURES SHALL BE MANUFACTURED IN ACCORDANCE WITH ASTM C-478.
3. ALTERNATE TOP SLAB MAY BE USED AS DICTATED BY DESIGN AND/OR FIELD CONDITIONS.
4. JOINT SEALANT BETWEEN PRECAST SECTIONS SHALL BE BUTYL RUBBER.
5. CATCH BASIN FRAME AND GRATE(S) SHALL MEET MUNICIPAL AND STATE SPECIFICATIONS WHEN APPLICABLE.

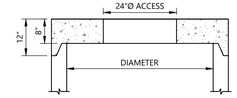
2 PRECAST CONCRETE CATCH BASIN

SCALE: NOT TO SCALE



3 PRECAST DRAINAGE MANHOLE

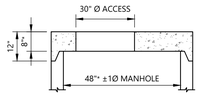
SCALE: NOT TO SCALE



ALTERNATIVE TOP SLAB

NOTES:

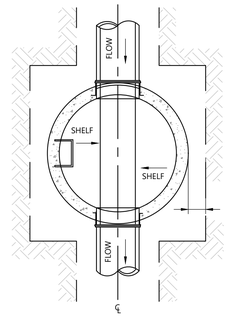
1. PRECAST CONCRETE STRUCTURES AND CASTINGS SHALL BE SUITABLE FOR HS-20 LOADINGS.
2. PRECAST CONCRETE STRUCTURES SHALL BE MANUFACTURED IN ACCORDANCE WITH ASTM C-478.
3. ALTERNATE TOP SLAB MAY BE USED AS DICTATED BY DESIGN AND/OR FIELD CONDITIONS.
4. UNLESS OTHERWISE NOTED, MANHOLES SHALL BE 48-INCH IN DIA.
5. MANHOLE FRAME AND GRATE(S) SHALL MEET MUNICIPAL AND STATE SPECIFICATIONS WHEN APPLICABLE.
6. 16" ALUM OR REINFORCED PLASTIC MANHOLE STEPS 12" ON CENTER.



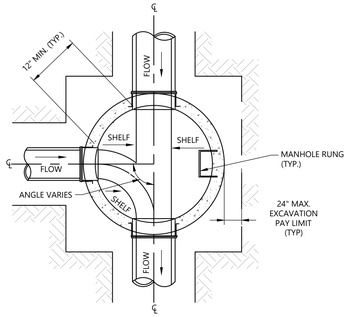
* VARIES BASED ON MH DIAMETER

ALTERNATIVE TOP SLAB
(STEEL REINFORCED FOR HS-20 LOADING)

SECTION



PLAN PIPE THROUGH



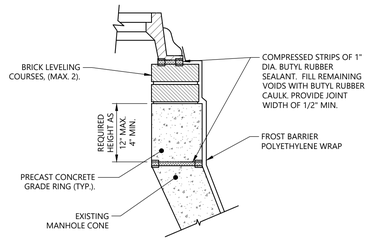
PLAN AT JUNCTION

NOTES

1. SEE SPECIFICATIONS FOR REQUIREMENTS.

4 SEWER MANHOLE

SCALE: NOT TO SCALE



5 STANDARD FRAME FASTENING

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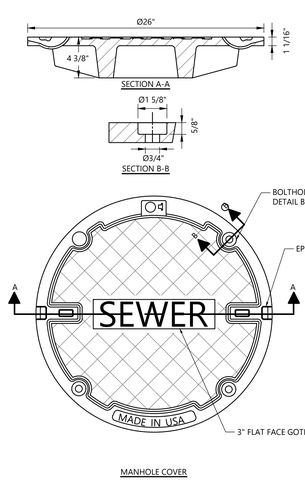

6 STANDARD SEWER MANHOLE FRAME AND COVER

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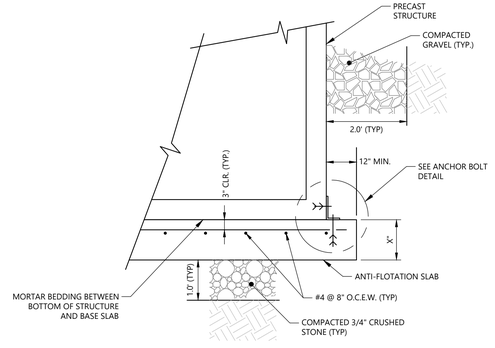

7 ANTI-FLOATING SLAB

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AUBURN ENGINE 2

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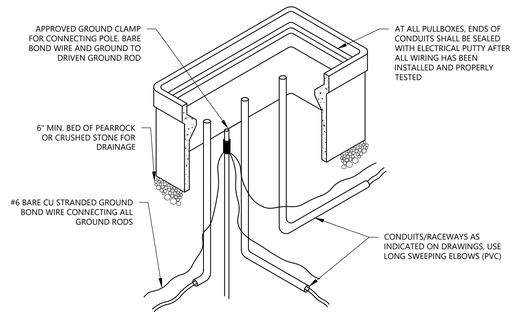
FILENAME:	233981.13 C-99-90X.dwg

DRAWING TITLE:
CIVIL
DETAILS - 4

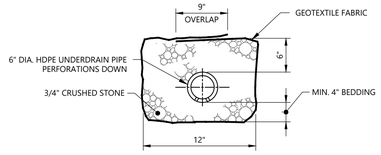
DRAWING NO:
C-99-904



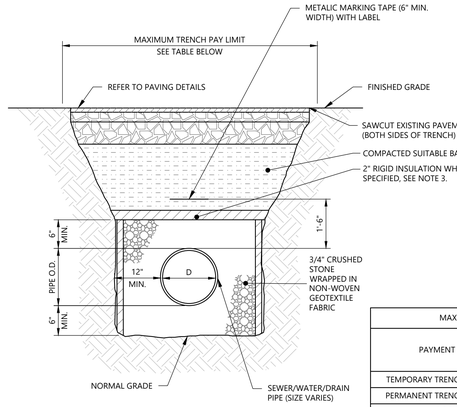
NOTES:

1. REFER TO ELECTRICAL DRAWINGS AND SPECIFICATIONS FOR CONDUIT SIZES, NUMBER OF CONDUITS, AND ADDITIONAL INFORMATION.
2. ELECTRIC PULL BOXES/HANDHOLES AND THEIR COVER SHALL BE SUITABLE FOR HS-20 LOADINGS.
3. FINAL DIMENSIONS OF PULL BOXES SHALL BE AS VERIFIED IN THE FIELD AND SHALL BE IN ACCORDANCE WITH NEC.
4. PULLBOX COVERS SHALL BE CAST IRON. PROVIDE EXTENSION AS REQUIRED.
5. PULLBOXES SHALL BE PRECAST EQUAL TO: GEORGE ROBERTS, BROOKS, OR A.C. MILLER.
6. REFER TO SPECIFICATIONS FOR FURTHER REQUIREMENTS.

1 PULL BOX
SCALE: NOT TO SCALE



2 UNDERDRAIN
SCALE: NOT TO SCALE

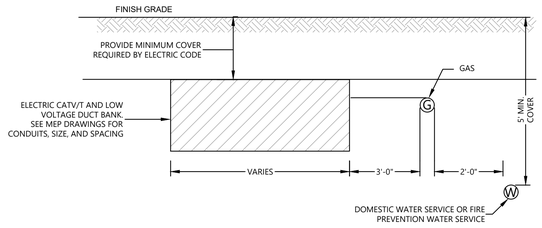


NOTES:

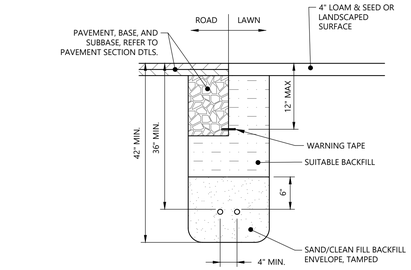
1. MAINTAIN UNIFORM TRENCH WIDTH TO 12" OVER PIPE.
2. SEE PAVEMENT DETAILS FOR PAVING AND PATCHING REQUIREMENTS.
3. MAINTAIN MINIMUM OF 5'-0" FT. OF COVER OVER PIPE. A 2" RIGID INSULATION WILL BE REQUIRED FOR WATER AND SEWER PIPES IN AREAS WITH INSUFFICIENT COVER WHEN DIRECTED BY ENGINEER.
4. IF EXCAVATION BELOW NORMAL GRADE IS REQUIRED, PROVIDE SHORING 2' BELOW TRENCH BOTTOM. BACKFILL TRENCH FROM TRENCH BOTTOM TO NORMAL GRADE WITH COMPACTED GRAVEL (6" COMPACTED LIFTS)
5. NO PAYMENT WILL BE MADE FOR SHEETING LEFT IN PLACE UNLESS DIRECTED BY ENGINEER.
6. PROVIDE 12" OF COMPACTED CRUSHED STONE BEDDING IF EXCAVATING IN ROCK.

MAXIMUM PAYMENT WIDTHS - TRENCH (SEWER/DRAIN)			
PAYMENT ITEM	DEPTH OF PIPE (GROUND SURFACE TO PIPE INVERTS)		
	0' TO 12'	12' TO 20'	OVER 20'
TEMPORARY TRENCH PAVEMENT	D + 4'-0"	D + 7'-0"	D + 8'-0"
PERMANENT TRENCH PAVEMENT	D + 6'-0"	D + 9'-0"	D + 10'-0"
ROCK	D + 3'-0"	D + 5'-0"	D + 5'-0"

3 TRENCH DETAIL
SCALE: NOT TO SCALE



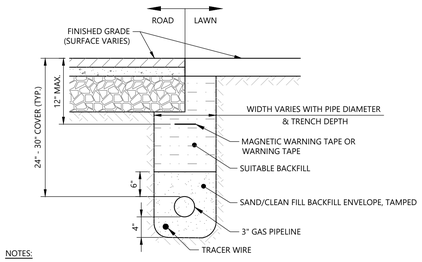
4 TYPICAL MINIMUM REQUIRED UTILITY SEPARATION
SCALE: NOT TO SCALE



NOTE:

1. ELECTRICAL SERVICE TRENCH SHOWN FOR TRENCH WORK SCOPE ONLY. REFER TO THE ELECTRICAL DRAWINGS FOR SERVICE CONDUIT TYPES AND DETAILS.

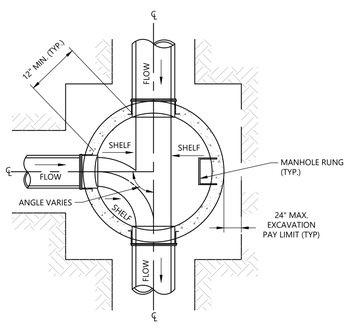
5 ELECTRICAL SERVICE TRENCH
SCALE: NOT TO SCALE



NOTES:

1. INSTALL IN ACCORDANCE WITH UTILITY OWNER REQUIREMENTS.

6 GAS PIPE TRENCH
SCALE: NOT TO SCALE

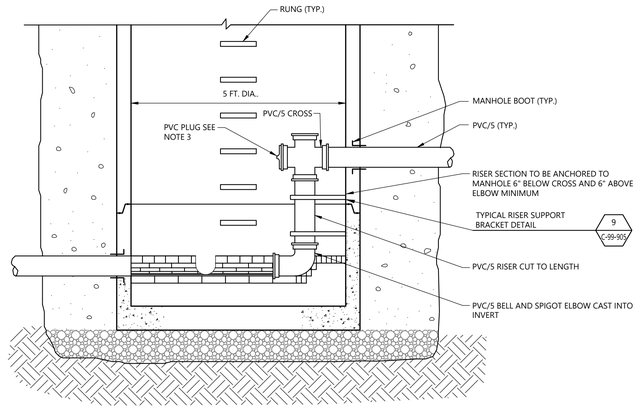


PLAN AT JUNCTION

NOTES:

1. SEE SPECIFICATIONS FOR REQUIREMENTS.

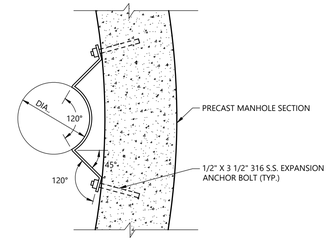
7 SEWER MANHOLE INVERT DETAIL
SCALE: NOT TO SCALE



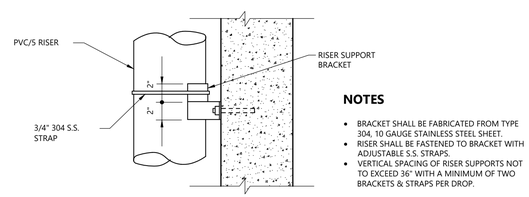
NOTES

1. SEE PRECAST MANHOLE SECTION FOR TYPICAL MANHOLE INFORMATION, INCLUDING NOTES.
2. PROVIDE DROP PIPE FOR ALL INVERT DIFFERENTIALS OF 2' OR GREATER OR AS APPROVED BY THE ENGINEER.
3. SECURE PLUG WITH STAINLESS STEEL SCREWS. CUT OFF TOP 1/3 OF PIPE PLUG.

8 TYPICAL PRECAST MANHOLE WITH INSIDE DROP DETAIL
SCALE: NOT TO SCALE



PLAN



ELEVATION

NOTES

- BRACKET SHALL BE FABRICATED FROM TYPE 304, 10 GAUGE STAINLESS STEEL SHEET.
- RISER SHALL BE FASTENED TO BRACKET WITH ADJUSTABLE S.S. STRAPS.
- VERTICAL SPACING OF RISER SUPPORTS NOT TO EXCEED 36" WITH A MINIMUM OF TWO BRACKETS & STRAPS PER DROP.

9 TYPICAL RISER SUPPORT BRACKET DETAIL
SCALE: NOT TO SCALE

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F: 207.221.2266
context ARCHITECTURE
Thornton Tomasetti

PE SEAL:

SITE PLAN REVIEW NOT FOR CONSTRUCTION

CLIENT INFO:

CITY OF AUBURN
180 SOUTH MAIN STREET
AUBURN, MAINE 04210

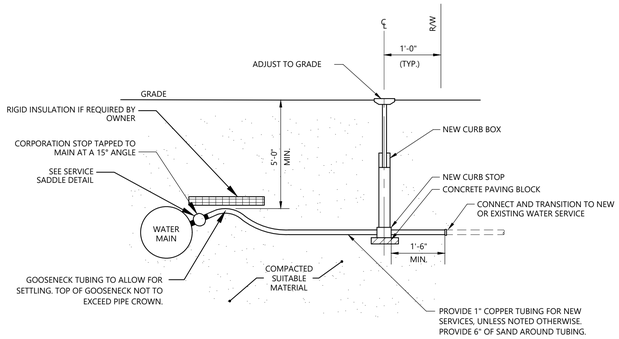
AUBURN ENGINE 2

REV	MM/DD/YY	DESCRIPTION
1	1/29/2025	RESPONSE TO CITY COMMENTS

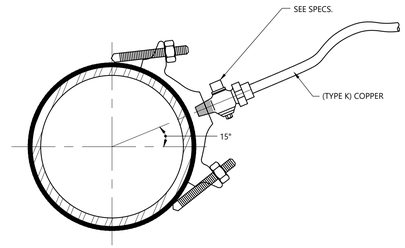
JOB NO:	233981.13
DATE:	JANUARY 2025
SCALE:	AS NOTED
DESIGNED BY:	RA
DRAWN BY:	MB
CHECKED BY:	CGS
FILENAME:	233981.13 C-99-90X.dwg

DRAWING TITLE:
CIVIL DETAILS - 5

DRAWING NO:
C-99-905



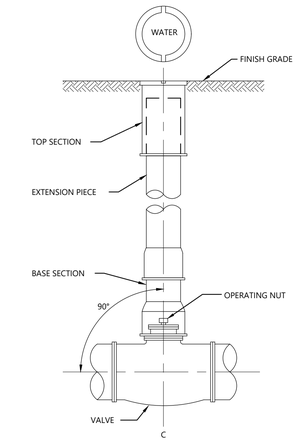
1 TYPICAL WATER SERVICE DETAIL
SCALE: NOT TO SCALE



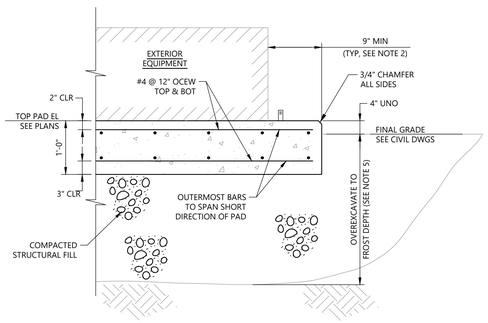
NOTES:

1. SERVICE CONNECTIONS (DIRECT TAPS AND SERVICE SADDLES) WILL BE INSTALLED SO THAT THE OUTLET IS AT AN ANGLE OF NOT MORE THAN 15° ABOVE THE HORIZONTAL. ALWAYS PUT A BEND OR "GOOSENECK" IN THE SERVICE LINE PRIOR TO CONNECTING TO PROVIDE FLEXIBILITY AND "GIVE" TO COUNTER THE EFFECTS OF A LOAD DUE TO SETTLEMENT OR EXPANSION AND/OR CONTRACTION (SEE DETAILS).

2 SERVICE CONNECTION DETAILS
SCALE: NOT TO SCALE



3 VALVE WITH VALVE BOX
SCALE: NOT TO SCALE



NOTES:

1. SEE MECHANICAL, PLUMBING, ELECTRICAL, CIVIL, AND STRUCTURAL DRAWINGS FOR EQUIPMENT LOCATIONS, QUANTITIES, AND LAYOUT.
2. PAD SHALL PROJECT A MINIMUM OF 9-INCH BEYOND MECHANICAL EQUIPMENT FOOTPRINT, UNLESS NOTED OTHERWISE. FOR ANCHOR RODS 5/8" DIA OR LESS, PAD PROJECTIONS MAY BE REDUCED FROM 9-INCH TO 6-INCH.
3. TOP OF PAD SHALL BE LEVEL WITHIN 1/8-INCH.
4. PROVIDE SACK-RUBBED FINISH TO ALL EXPOSED SIDES OF EQUIPMENT PAD AND A TROWEL FINISH TO THE TOP SURFACE.
5. PROVIDE COMPACTED STRUCTURAL FILL UNDER PAD FOOTPRINT TO FROST DEPTH TO PREVENT FROST HEAVE. IF OVER-EXCAVATION IS NOT FEASIBLE, EXCAVATE 15.5", PROVIDE 3.5-INCH MINIMUM RIGID INSULATION UNDER ENTIRE PAD AND EXTENDING A MINIMUM OF 4.5-FT BEYOND ALL SIDES OF THE EQUIPMENT PAD, AND PROVIDE 12" COMPACTED STRUCTURAL FILL.
6. PROVIDE SAWED JOINT (SJ) IN EQUIPMENT PADS, IF SHOWN AND NOTED ON PLANS.
8. ANCHOR RODS SHALL BE 316 AISI STAINLESS STEEL, UNLESS NOTED OTHERWISE.
9. PRIOR TO EQUIPMENT INSTALLATION, APPLY CURE AND SEAL COMPOUND OR WATERPROOFING TO EQUIPMENT PAD SURFACES.

4 GENERATOR PAD
SCALE: NOT TO SCALE

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Portland, Maine 04103
P: 207.221.2260
F: 207.221.2266

context ARCHITECTURE

Thornton Tomasetti

PE SEAL:

SITE PLAN REVIEW
NOT FOR CONSTRUCTION

CLIENT INFO:

CITY OF AUBURN
180 SOUTH MAIN STREET
AUBURN, MAINE 04210

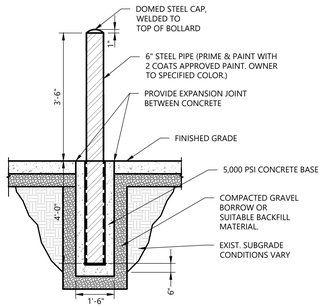
AUBURN ENGINE 2

REV	MM/DD/YY	DESCRIPTION
1	1/29/2025	RESPONSE TO CITY COMMENTS

JOB NO:	233981.13
DATE:	JANUARY 2025
SCALE:	AS NOTED
DESIGNED BY:	RA
DRAWN BY:	MB
CHECKED BY:	CGS
FILENAME:	233981.13 C-99-90X.dwg

DRAWING TITLE:
CIVIL
DETAILS - 6

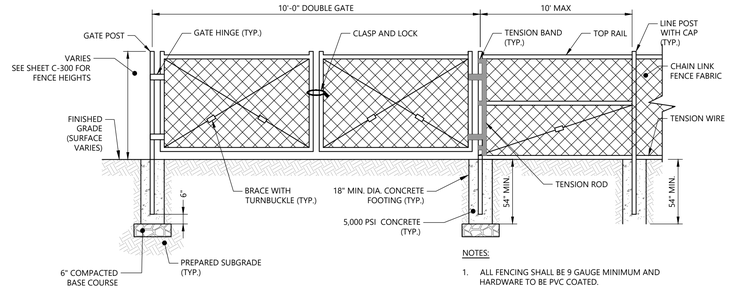
DRAWING NO:
C-99-906



NOTES:

1. BOLLARD SPECIFICATIONS PER MANUFACTURER TO BE SUBMITTED TO EOR FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION.
2. PROVIDE A MINIMUM 2-FT SPACING FROM UNDERGROUND UTILITIES.

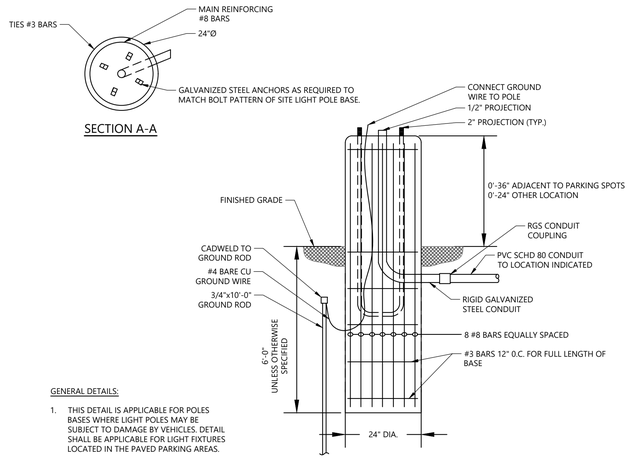
49 BOLLARDS
SCALE: NOT TO SCALE



NOTES:

1. ALL FENCING SHALL BE 9 GAUGE MINIMUM AND HARDWARE TO BE PVC COATED.
2. INSTALL ALL FENCING AND HARDWARE IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.

50 CHAIN LINK FENCE AND GATE
SCALE: NOT TO SCALE



GENERAL DETAILS:

1. THIS DETAIL IS APPLICABLE FOR POLES BASES WHERE LIGHT POLES MAY BE SUBJECT TO DAMAGE BY VEHICLES. DETAIL SHALL BE APPLICABLE FOR LIGHT FIXTURES LOCATED IN THE PAVED PARKING AREAS.

51 LIGHT POLE
SCALE: NOT TO SCALE

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context ARCHITECTURE

Thornton Tomasetti

PE SEAL:

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CLIENT INFO:

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AUBURN, MAINE 04210

AUBURN ENGINE 2

REV	MM/DD/YY	DESCRIPTION
1	1/29/2025	RESPONSE TO CITY COMMENTS

JOB NO:	233981.13
DATE:	JANUARY 2025
SCALE:	AS NOTED
DESIGNED BY:	RA
DRAWN BY:	MB
CHECKED BY:	CGS
FILENAME:	233981.13 C-99-90X.dwg

DRAWING TITLE:
CIVIL
DETAILS - 7

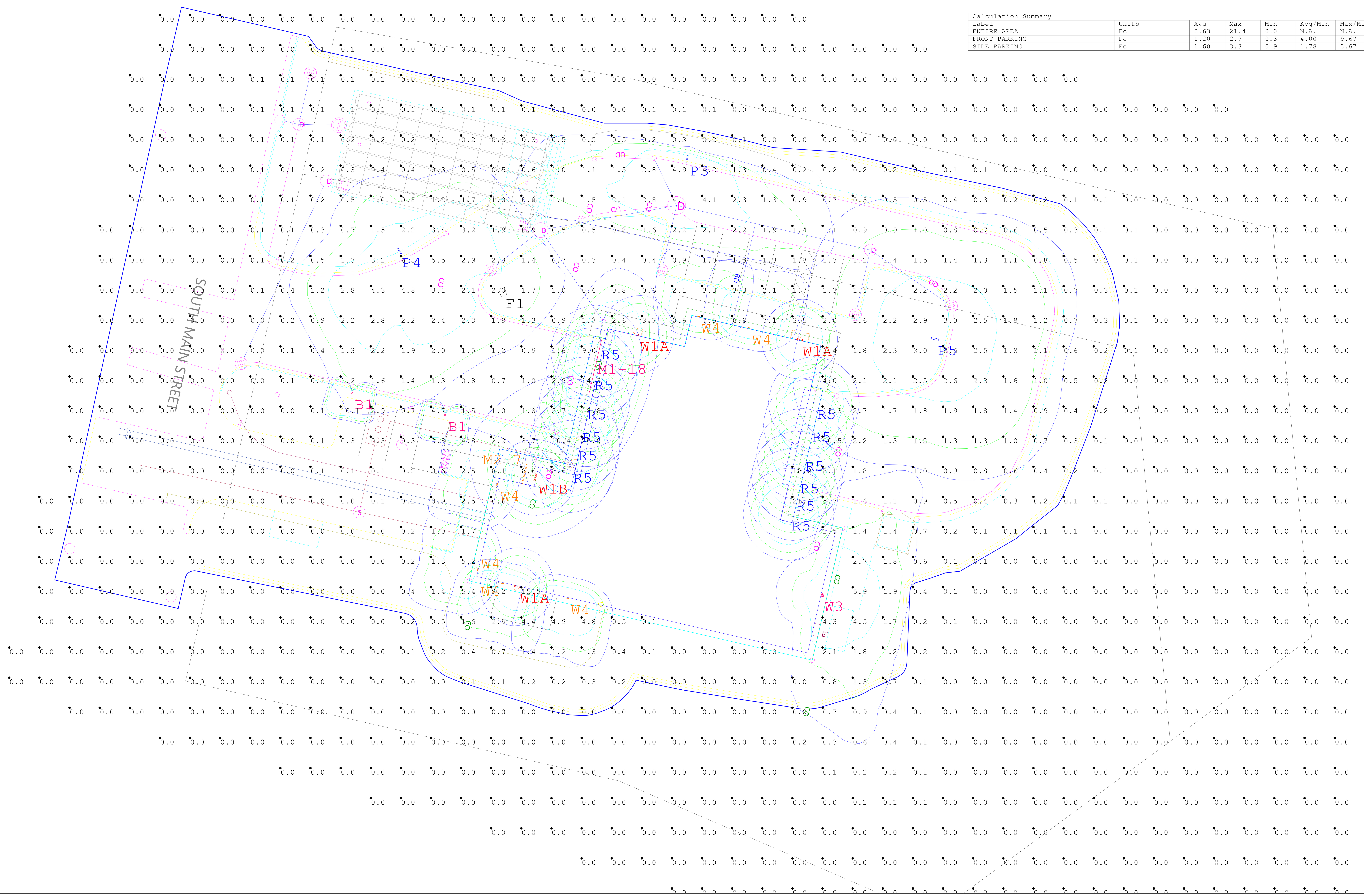
DRAWING NO:
C-99-907

Luminaire Schedule

Symbol	Qty	Label	Arrangement	Description	Tag	LLF	Luminaire Lumens
	2	B1	Single	NLS: TBL-42-T4-16L-40-40K7-UNV-AB-CXX		0.750	2206
	1	F1	Single	MAGNIFLOOD: BAYVILLE L4-LED-49 // POLE TOP ADAPTER MF-2764-DIAMXX-CXX	ADVISE 3 INCH OR 4 INCH DIAM FLAGPOLE TOP	0.900	4460
	1	M1-18	GROUP	SPI: SIW12139-6FT-L24W-120-277V-4000K-DF_80-DF_DIM1-DF_MCS-RUN OAL 18'-DF_FT-OAP18IN	CONFIRM LENGTH REQUIRED TO SPAN SIGN	0.900	N.A.
	1	M2-7	Single	NULITE: RXT-F-D--ASYM-07L40-UNV-D-11-CXX-7		1.570	2869
	1	P3	Single	NLS: TRC-T3-32L-7-40K7-UNV-SGL-CXX-HSS-16	MTD 18' AFG ON 16' POLE AND 2' CONCRETE BASE // POLE INCLUDED IN FIXTURE CAT#	0.900	6552
	1	P4	Single	NLS: TRC-T4-32L-1-40K7-UNV-SGL-CXX-16	MTD 18' AFG ON 16' POLE AND 2' CONCRETE BASE // POLE INCLUDED IN FIXTURE CAT#	0.900	12453
	1	P5	Single	NLS: TRC-T5-32L-1-40K7-UNV-SGL-CXX-16	MTD 18' AFG ON 16' POLE AND 2' CONCRETE BASE // POLE INCLUDED IN FIXTURE CAT#	0.900	12699
	12	R5	Single	ALPHABET: NU4-RD-SW-25LM-30K-80-50D-DL-CXX-CXX-NC-UNV-DIM10		0.900	2329
	3	W1A	Single	STARTEK: HYDROD-2-750-SD-35K-80-PB-WM-U-EC-MOD	WALL MTD 8' AFG, OVER DOORS	0.375	4002
	1	W1B	Single	STARTEK: HYDROD-2-750-SD-35K-80-PB-MM-U-EC-MOD	MULLION MOUNT // WALL MTD 8' AFG, OVER DOORS	0.375	4002
	1	W3	Single	NLS: NV-W-T3-16L-1-40K7-UNV-WM-CXX	WALL MTD 14' AFG	0.900	6390
	6	W4	Single	PERFORMANCE IN LIGHTING: M20-M-26-T4-CXX-70-4K-UNV-0-10V	WALL MTD 8' AFG	0.900	2183

Calculation Summary

Label	Units	Avg	Max	Min	Avg/Min	Max/Min
ENTIRE AREA	Fc	0.63	21.4	0.0	N.A.	N.A.
FRONT PARKING	Fc	1.20	2.9	0.3	4.00	9.67
SIDE PARKING	Fc	1.60	3.3	0.9	1.78	3.67



CHARRON REFLEX LIGHTING

#	Date	Comments

Revisions

Drawn By: Michael O'Brien
Checked By:
Date:1/21/2025
Contact: mobrien@charroninc.com
Scale: NTS

AUBURN FIRE ENGINE 2 SITE LIGHTING

AUBURN, ME