Conceptual Design Study

Somersworth Fire Department

Somersworth, NH

January 21, 2020

Conceptual Design Study
Proposed Somersworth Fire Station

CITY OF SOMERSWORTH, N.H.

CITY COUNCIL

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Robert M. Belmore

Deputy City Manager / Director of Finances

Scott A. Smith

Fire Chief

Keith E. Hoyle

City Engineer

Gary Lemay

January 21, 2020

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1.01 EXECUTIVE SUMMARY

In August 2019 the City of Somersworth, NH contracted with Port One Architects to prepare a conceptual design study and cost estimate for the construction of a new central fire station. Prior reports of the existing building and site options concluded that a replacement station should be constructed on the existing Maple Street site. City representatives met with Port One Architects and their engineering consultants regularly over the following months to review program requirements, opportunities, site challenges and design concepts.

The most important aspect of fire station design is to respond to the dynamic needs of emergency response services. The evolving definition of emergency response places increased demands on facility design. A primary objective of this study has been combining traditional fire house aesthetics and materials with accommodations for the latest in technology and fire response demands.

During the development of this conceptual design, the preliminary focus was on the current location to determine if this site was sufficient in size to accommodate an adequate facility that will provide exceptional service for the community now and well into the future. The basis for this evaluation was a geotechnical survey to determine subgrade conditions using soil borings to confirm suitbility for the proposed construction.

Subsequent to site evaluation, an analysis of the existing facility was conducted to develop architectural and engineering base plans, which allowed the Team to plan for a phased construction delivery while maintaining full, 24-hr operability of the existing station.

The design team's approach has been to include stakeholder and Owner input at every stage of this study. The Team used critical feedback for decision-making, testing assumptions, reviewing results, and collectively arriving at preferred solutions. The process is open, transparent and produces efficient design results. Stakeholders will remain actively involved thru design development, construction and project closeout.

The new station represents a sensitive and functional response to the physical environment surrounding the site. The building design reflects concepts of traditional New England fire stations that provide a vital community service while projecting civic prominence. The site design responds to traffic, sunlight, circulation, parking, landscaping, pedestrian access and main entry point.

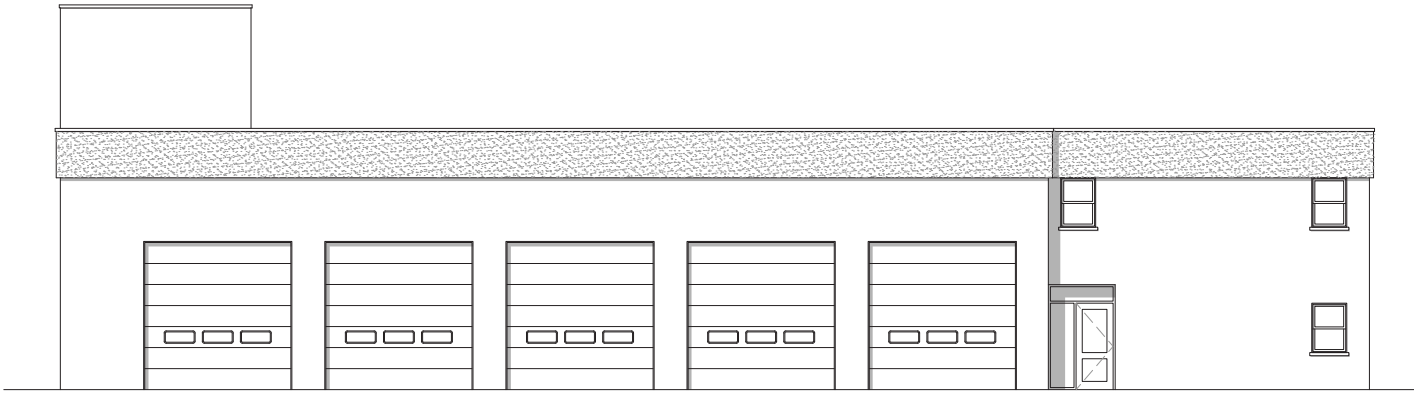
This document should serve both as a summary of findings and as the base for a strategic approach towards the design development and construction of the proposed Somersworth Fire Station.

2.01 EXISTING CONDITIONS

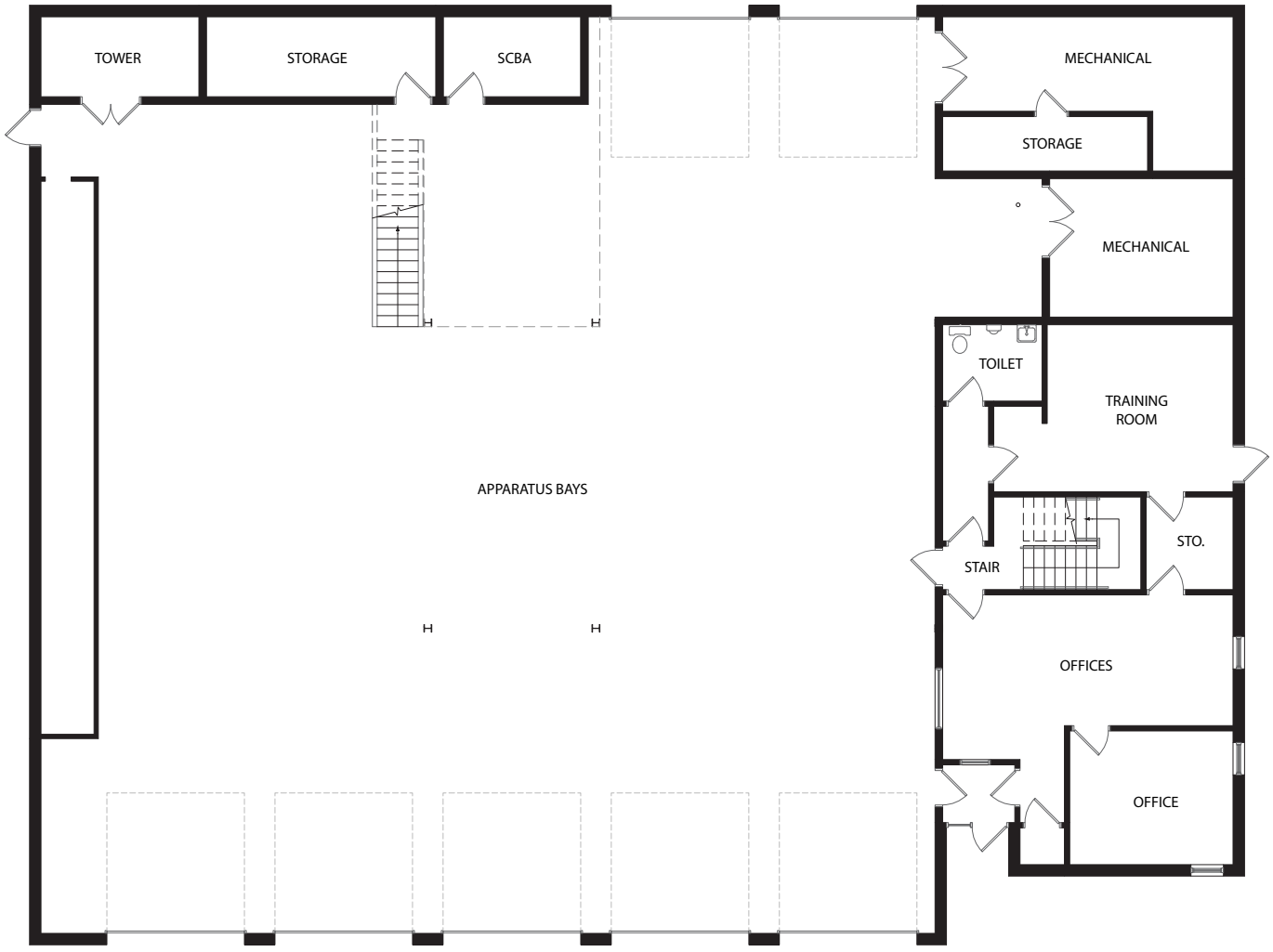
The existing fire station is situated on the northeast side of Maple Street. The design team researched existing documents, drawings and maps in the City's engineering and planning archives. Additional information was made available by our geotechnical consultant, S.W. Cole Engineering, on existing utilities and the limit of the landfill located southwest of the station.

The team was able to get a clear understanding of the existing site conditions and the constraints for siting the new building and its vehicle circulation/ parking based on review of the compiled background information.

Aerial of Existing Station
Existing Somersworth Maple Street Station
with the site boundary marked in red



Existing Northeast Existing Elevation
Not to Scale



Existing First Floor Plan
Not to Scale

BACKGROUND INFORMATION

Two critical references were used in the analysis of background information provided by the City:

2016: A Fire Station Advisory Committee space study analysis that looked at the current station deficiencies and proposed space programming suggestions.

2018: A Fire Service Deployment Analysis by MRI which analyzed the current station, referenced several pertinent codes and conducted a response study with current resource deployment and incident analysis.

2016 - Fire Station Advisory Committee Report

Executive Summary

Based on our evaluation, the current Somersworth Fire Station is in fair condition and very well maintained. However, due to its original design and orientation on the site the facility has a very limited expansion capability. The facility as it relates to the department's current needs is insufficiently sized in all three aspects of a fire station, administrative spaces, apparatus bays and firefighters living quarters.

This depletion of spaces is not conducive to a standalone fire station and consequently it is impacting the fire department's operations and administrative functions. The current fire station was not constructed with the growth in mind that the department has experienced over the past three decades.

When we factor in the anticipated station's growth over the long term, along with the programmatic needs of the station, the facility becomes excessively undersized. Our evaluation also revealed that if the station is to be expanded, then most of the building systems would also need to be upgraded due to the age and lifecycle of these systems.

To date, this facility has adequately served the community. That said, technological advances in firefighting equipment, the expansion of the departments' services and the need to look toward additional staff in the future, the existing buildings limitations are currently, and will continue to limit the department's ability to carry out its mission. All are in conflict with the constraints of the facility. Based on the building evaluation and the programmatic needs of the department, the station needs to be expanded or replaced. The spaces requiring the most expansion are the firefighter living quarters, and the administrative offices. Due to their organization within the facility and on the site, the options for expanding the existing facility are very limited. Therefore, the committee recommends a new facility be constructed.

The options available to the fire department are as follows:

Option A - New Facility on Existing Site
The existing fire station site is too narrow to accommodate any possible expansion on the existing building without purchasing adjacent property. The site could, however, accommodate the construction of a new building with the removal of the existing. There would be a need to clarify the right of way established by the City between the National Guard property and the current site. If that land could be included in the buildable area of a new fire station the existing site could be utilized.

Option B - New Facility on New Site
In this option, a new facility would be constructed on a new site. Once the new facility is constructed, the station's operations can be shifted from the existing to the new with little disturbances. The existing station can then be sold or re-utilized by the Town.

2018 - MRI Fire Service Deployment Analysis – Management Letter
Summary of Recommendations

The following five recommendations were developed based on the analysis of data presented during the course of this study.

Recommendation III-1 The City of Somersworth should develop a three-year strategy to replace the existing fire station. The goal of this project should be to occupy the new station in the Fall of 2022.

Recommendation III-2 The City of Somersworth should form a Building Committee and authorize the appropriate steps necessary to fast track the development of a new fire station.

Recommendation VI-1 The new station should be designed to accommodate the projected apparatus set including two ambulances and a squad. This will require five double depth bays.

Recommendation VII-1 The City of Somersworth should consider both response ergonomics and the function or relative hazard of adjacent spaces in the design of the new fire station.

Recommendation IX-1 Considering both cost and response time, the City of Somersworth should construct the new fire station at the 195 Maple Street site.Conclusion

The existing fire station has exceeded its useful life and is no longer a viable operational platform for the Somersworth Fire Department. Our Project team found that a potential renovation of the existing facility was both impractical and imprudent. This station should be replaced, and a new facility should be authorized as soon as possible.

Considering cost and risk, it is apparent that constructing a fire station on Lilac Lane would cost the City more and produce a long-term operational deficit by decreasing average response times by 1:12 to the majority of incidents in the City. Therefore, the new Somersworth Fire Station should be constructed on the existing Maple Street site. Given the operational obstacles that will be created by the selection of this site, it is essential that a phased demolition and construction methodology be employed. We believe that the obstacles that will develop can be easily overcome through stakeholder communication and cooperation.

3.01 GEOTECHNICAL SURVEY

S.W. COLE Engineering has knowledge of the adjacent properties from previous work undertaken in early 2000s for the senior housing on the north side of Park View Terrace. Work on this site encountered uncontrolled urban fill that required removal prior to construction. As part of the environmental services on this site it is their understanding that the groundwater flow of the landfill located to the west is moving west, away from the fire station site.

The consultants understand the City would utilize a portion of the landfill property for the fire station. The City provided S.W. COLE with information on record as to the approximate limits of the landfill waste. S.W. COLE's geotechnical exploration program began east of that known line and proceed east to determine if the limit of landfill waste is accurate. This helps determine potential buildable space on the landfill property.

It is also understood that the City owned easement to the south of the fire station property will be considered for use for new construction. (After deed and site plan research it was determined that this r.o.w. on tax maps is actually part of the fire station site plan).

Given the proximity of the landfill and the known urban filling that occurred at the senior housing, geotechnical explorations will focus on assessing the presence of unsuitable fill from a building construction standpoint.

S.W. COLE's scope included field screening of the boring samples for volatile organic compounds with a photoionization detector (PID). Samples that exhibited elevated readings on the PID or showed visual or olfactory evidence of possible contamination will be preserved for possible environmental analytical testing.

Asbestos containing materials (ACM) and lead paint are a consideration for demolition and disposal of the existing building. ACM and lead paint survey is scheduled to be performed at a later date.

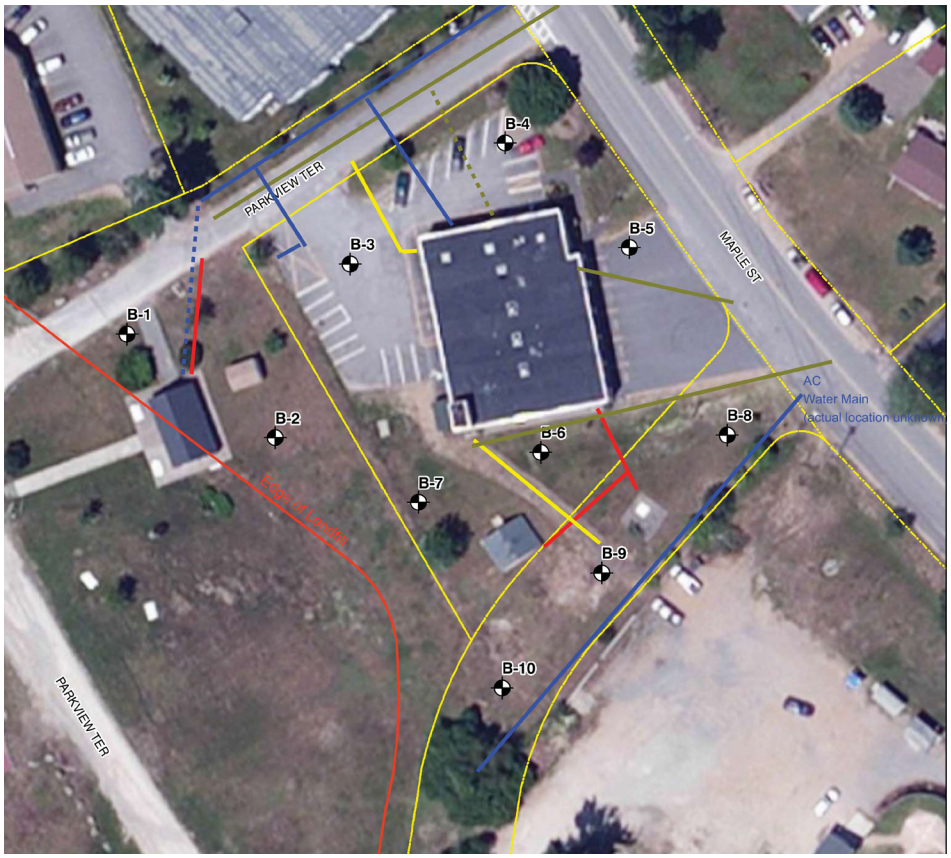
Borings Log & Utility Map

In the appendix is a plan depicting approximate locations what our utility locator found. The dashed lines were found using dousing rods. None of these lines should be used for later site design purposes as they are an approximation, reflecting what was picked up scanning the areas of the borings.

The team received the environmental testing back on samples from borings B-2 and B-7. The results came back with levels below the required reporting limits for each contaminant with the exception of arsenic which exceeded the standard. This is fairly typical in NH and the arsenic could be naturally occurring, which would not be an issue. The elevate level will require reporting the findings to NHDES which is the responsibility of the owner. The consultants can assist in this process at a later date. This is typically researched and determined by sampling and testing soils for "background levels" in area of the site with natural soils. The fill soils found in boring B-2 and B-7 which contained some debris do not seem to be characterized as "municipal waste" that would be found in a landfill.

In general undocumented/uncontrolled fill was observed to depths of 1 to 7 feet below the ground surface. The team's recommendation for subgrade preparation is to over-excavate the fill below the proposed footings. The fill generally appears to be granular and can likely be reused to backfill the excavations in controlled compacted lifts. There may need to be some selective sorting and separation of debris. Disposal of culled debris or unsuitable soils will need to be a consideration.

Beyond this, the site has adequate bearing characteristic to support the proposed building with conventional frost-protected spread footing foundations.



Somersworth Fire Station Borings Map with Utilities
Color Legend:
(Gold): Floor Drains
(Blue): Water
(Red): Electricity
(Green): Sewer
(Yellow): Old Propane
(Dotted Blue): Assumed Water
(Dotted Green): Assumed Sewer

S.W.COLE ENGINEERING, INC.

BORING LOG

CLIENT: Port One Architects
PROJECT: Proposed Fire Station
LOCATION: 195 Maple St., Somersworth, NH

BORING NO.: B- 1
SHEET: 1 of 1
PROJECT NO. 18-1709
DATE START: 9/5/2019
DATE FINISH: 9/5/2019

Drilling Information

LOCATION: See Exploration Location Plan | **ELEVATION (FT):** N/A | **TOTAL DEPTH (FT):** 12.0 | **LOGGED BY:** Tyler Demers
DRILLING CO.: S.W.Cole Explorations, LLC | **DRILLER:** Corey Culligan | **DRILLING METHOD:** Hollow Stem Auger
RIG TYPE: Track Mounted Diedrich D-50 | **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:** N/A
HAMMER EFFICIENCY FACTOR: | **HAMMER DROP (inch):** 30
WATER LEVEL DEPTHS (ft): No free water observed
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 / PID Readings	Graphic Log	Sample Description & Classification	H_2O Depth	Remarks
			1D		0-2	24/12	2-9-16-16	PID=12.2 ppm		0.5 6" Grassed Topsoil Medium dense to dense, brown-orange Gravelly SAND some silt (Possible Fill)		
			2D		2-4	24/12	14-15-12-10	PID=8 ppm				
	5		3D		5-7	24/14	15-13-13-12	PID=2.1 ppm				
			4D		7-9	24/18	13-10-11-10	PID=6.7 ppm		7.0 Medium dense, light gray-orange SAND some silt		
	10		5D		10-12	24/1	5-5-5-6	PID=2.6 ppm				

Bottom of Exploration at 12.0 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 NO.: B- 1

BORING / WELL 18-1709.GPJ SWCE TEMPLATE.GDT 9/19/19

S.W.COLE ENGINEERING, INC.

S.W.COLE ENGINEERING, INC.

BORING LOG

CLIENT: Port One Architects
PROJECT: Proposed Fire Station
LOCATION: 195 Maple St., Somersworth, NH

BORING NO.: B- 2
SHEET: 1 of 1
PROJECT NO. 18-1709
DATE START: 9/5/2019
DATE FINISH: 9/5/2019

Drilling Information

LOCATION: See Exploration Location Plan | **ELEVATION (FT):** N/A | **TOTAL DEPTH (FT):** 12.0 | **LOGGED BY:** Tyler Demers
DRILLING CO.: S.W.Cole Explorations, LLC | **DRILLER:** Corey Culligan | **DRILLING METHOD:** Hollow Stem Auger
RIG TYPE: Track Mounted Diedrich D-50 | **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:** N/A
HAMMER EFFICIENCY FACTOR: | **HAMMER DROP (inch):** 30
WATER LEVEL DEPTHS (ft): No free water observed
GENERAL NOTES:

KEY TO NOTES AND SYMBOLS:
Water Level: ▽ At time of Drilling; ▼ At Completion of Drilling; ▼ After Drilling
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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 / PID Readings	Graphic Log	Sample Description & Classification	H_2O Depth	Remarks
			1D		0-2	24/12	3-2-6-20	PID=14.1 ppm		0.5 6" Grassed Topsoil Medium dense to dense, brown Gravelly SAND some silt with plastic and glass (Fill)		
			2D		2-4	24/4	12-17-20-24	PID=48.1 ppm				
	5		3D		5-7	24/12	29-17-17-15	PID=25.8 ppm		5.0 Dense to medium dense, brown-orange Gravelly SAND some silt		
			4D		7-9	24/14	12-11-11-11	PID=6.9 ppm				
	10		5D		10-12	24/12	9-8-11-9	PID=17.7 ppm				

Bottom of Exploration at 12.0 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 NO.: B- 2

BORING / WELL 18-1709.GPJ SWCE TEMPLATE.GDT 9/19/19

S.W.COLE ENGINEERING, INC.

BORING LOG

CLIENT: Port One Architects
PROJECT: Proposed Fire Station
LOCATION: 195 Maple St., Somersworth, NH

BORING NO.: B- 3
SHEET: 1 of 1
PROJECT NO. 18-1709
DATE START: 9/5/2019
DATE FINISH: 9/5/2019

Drilling Information

LOCATION: See Exploration Location Plan
ELEVATION (FT): N/A
TOTAL DEPTH (FT): 22.0
LOGGED BY: Tyler Demers
DRILLING CO.: S.W.Cole Explorations, LLC
DRILLER: Corey Culligan
DRILLING METHOD: Hollow Stem Auger
RIG TYPE: Track Mounted Diedrich D-50
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: N/A
HAMMER EFFICIENCY FACTOR:
HAMMER DROP (inch): 30
WATER LEVEL DEPTHS (ft): Soils appear saturated below 17 feet
GENERAL NOTES:

KEY TO NOTES AND SYMBOLS:
Water Level: ▽ At time of Drilling; ▼ At Completion of Drilling; ▼ After Drilling
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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 / PID Readings	Graphic Log	Sample Description & Classification	H_20 Depth	Remarks
			1D		0.3-2.3	24/14	7-8-9-8	PID=1.2 ppm		0.3 4" Asphalt Pavement 1.0 Medium dense to dense, brown Gravelly SAND some silt (Fill)		
			2D		2.3-4.3	24/12	12-15-14-15	PID=1.3 ppm		2.0 Medium dense, light gray-light brown fine to medium SAND trace silt Dense, brown-orange Gravelly SAND some silt		
	5		3D		5-7	24/14	5-6-9-8	PID=1.4 ppm		5.0 Medium dense, brown-orange SAND some gravel trace silt		
	10		4D		10-12	24/18	4-3-5-4	PID=2.1 ppm		10.0 Loose, light gray-light brown fine to medium SAND some silt		
	15		5D		15-17	24/18	3-3-4-5	PID=4.5 ppm				
	20		6D		20-22	24/18	3-4-6-7					

Bottom of Exploration at 22.0 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 NO.: B- 3

BORING / WELL 18-1709.GPJ SWCE TEMPLATE.GDT 9/19/19

S.W.COLE ENGINEERING, INC.

S.W.COLE ENGINEERING, INC.

BORING LOG

CLIENT: Port One Architects
PROJECT: Proposed Fire Station
LOCATION: 195 Maple St., Somersworth, NH

BORING NO.: B- 4
SHEET: 1 of 1
PROJECT NO. 18-1709
DATE START: 9/5/2019
DATE FINISH: 9/5/2019

Drilling Information

LOCATION: See Exploration Location Plan | **ELEVATION (FT):** N/A | **TOTAL DEPTH (FT):** 14.6 | **LOGGED BY:** Tyler Demers
DRILLING CO.: S.W.Cole Explorations, LLC | **DRILLER:** Corey Culligan | **DRILLING METHOD:** Hollow Stem Auger
RIG TYPE: Track Mounted Diedrich D-50 | **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:** N/A
HAMMER EFFICIENCY FACTOR: | **HAMMER DROP (inch):** 30
WATER LEVEL DEPTHS (ft): No free water observed
GENERAL NOTES:

KEY TO NOTES AND SYMBOLS:
Water Level: ▽ At time of Drilling; ▼ At Completion of Drilling; ▼ After Drilling
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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 / PID Readings	Graphic Log	Sample Description & Classification	H_20 Depth	Remarks
			1D		0.3-2.3	24/12	4-3-3-3	PID=1.9 ppm		0.3 4" Asphalt Pavement Loose, brown Gravelly SAND some silt (Fill)		
			2D		2.3-4.3	24/6	4-3-2-2	PID=2.4 ppm ID 18858S w =5 %				
	5		3D		5-7	24/12	2-1-2-2	PID=2.2 ppm		6.0 Loose, dark brown Silty fine SAND with rootlets 6.5 Loose, light brown Silty fine SAND		
	10		4D		10-12	24/18	4-7-7-6	PID=1.3 ppm		10.0 Medium dense, light gray-light brown fine to medium SAND trace gravel trace silt		

Refusal at 14.6 feet
Probable Boulder

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 NO.: B- 4

BORING / WELL 18-1709.GPJ SWCE TEMPLATE.GDT 9/19/19

S.W.COLE ENGINEERING, INC.

BORING LOG

CLIENT: Port One Architects
PROJECT: Proposed Fire Station
LOCATION: 195 Maple St., Somersworth, NH

BORING NO.: B- 5
SHEET: 1 of 1
PROJECT NO. 18-1709
DATE START: 9/5/2019
DATE FINISH: 9/5/2019

Drilling Information

LOCATION: See Exploration Location Plan | **ELEVATION (FT):** N/A | **TOTAL DEPTH (FT):** 22.0 | **LOGGED BY:** Tyler Demers
DRILLING CO.: S.W.Cole Explorations, LLC | **DRILLER:** Corey Culligan | **DRILLING METHOD:** Hollow Stem Auger
RIG TYPE: Track Mounted Diedrich D-50 | **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:** N/A
HAMMER EFFICIENCY FACTOR: | **HAMMER DROP (inch):** 30
WATER LEVEL DEPTHS (ft): Soils appear saturated below 17 feet
GENERAL NOTES:

KEY TO NOTES AND SYMBOLS:
Water Level: ▽ At time of Drilling; ▼ At Completion of Drilling; ▼ After Drilling
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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 / PID Readings	Graphic Log	Sample Description & Classification	H_2O Depth	Remarks
			1D		0.3-2.3	24/12	10-11-27-19	PID=1.9 ppm		0.3 4" Asphalt Pavement Dense, brown Gravelly SAND some silt (Fill)		
			2D		2.3-4.3	24/12	16-26-24-16	PID=1.7 ppm				
	5		3D		5-7	24/14	8-11-13-11	PID=1.1 ppm		7.0 Dark brown Silty fine SAND		
										9.0 Loose, light gray fine to medium SAND trace silt		
	10		4D		10-12	24/14	6-5-5-4	PID=1.4 ppm				
	15		5D		15-16	12/6	33-50			15.0 Very dense, light brown-gray Silty fine SAND and GRAVEL		
	20		6D		20-22	24/0	23-30-40-30					

Bottom of Exploration at 22.0 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 NO.: B- 5

BORING / WELL 18-1709.GPJ SWCE TEMPLATE.GDT 9/19/19

S.W.COLE ENGINEERING, INC.

S.W.COLE ENGINEERING, INC.

BORING LOG

CLIENT: Port One Architects
PROJECT: Proposed Fire Station
LOCATION: 195 Maple St., Somersworth, NH

BORING NO.: B- 6
SHEET: 1 of 1
PROJECT NO. 18-1709
DATE START: 9/5/2019
DATE FINISH: 9/5/2019

Drilling Information

LOCATION: See Exploration Location Plan | **ELEVATION (FT):** N/A | **TOTAL DEPTH (FT):** 20.0 | **LOGGED BY:** Tyler Demers
DRILLING CO.: S.W.Cole Explorations, LLC | **DRILLER:** Corey Culligan | **DRILLING METHOD:** Hollow Stem Auger
RIG TYPE: Track Mounted Diedrich D-50 | **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:** N/A
HAMMER EFFICIENCY FACTOR: | **HAMMER DROP (inch):** 30
WATER LEVEL DEPTHS (ft): Soils appear saturated below 15.5 feet
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 / PID Readings	Graphic Log	Sample Description & Classification	H_20 Depth	Remarks
			1D		0-2	24/14	1-2-6-9	PID=1.8 ppm		12" Grassed Topsoil		
										1.0 Medium dense to loose, brown Gravelly SAND some silt (Fill)		
			2D		2-4	24/0	4-3-2-3					
	5		3D		5-7	24/1	3-3-4-7					
			4D		7-9	24/12	7-9-8-6	PID=2.1 ppm ID 18859s w =3.3 %		7.5 Medium dense, brown SAND some gravel trace silt		
	10		5D		10-12	24/14	3-3-5-6	PID=4.9 ppm		10.0 Loose, light gray-light brown fine to medium SAND trace silt		
	15		6D		15-17	24/18	2-2-4-4					
	20									Bottom of Exploration at 20.0 feet Running Sands: 2 foot blow-in		

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 NO.: B- 6

BORING / WELL 18-1709.GPJ SWCE TEMPLATE.GDT 9/19/19

S.W.COLE ENGINEERING, INC.

BORING LOG

CLIENT: Port One Architects
PROJECT: Proposed Fire Station
LOCATION: 195 Maple St., Somersworth, NH

BORING NO.: B- 7
SHEET: 1 of 1
PROJECT NO. 18-1709
DATE START: 9/5/2019
DATE FINISH: 9/5/2019

Drilling Information

LOCATION: See Exploration Location Plan | **ELEVATION (FT):** N/A | **TOTAL DEPTH (FT):** 12.0 | **LOGGED BY:** Tyler Demers
DRILLING CO.: S.W.Cole Explorations, LLC | **DRILLER:** Corey Culligan | **DRILLING METHOD:** Hollow Stem Auger
RIG TYPE: Track Mounted Diedrich D-50 | **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:** N/A
HAMMER EFFICIENCY FACTOR: | **HAMMER DROP (inch):** 30
WATER LEVEL DEPTHS (ft): No free water observed
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 / PID Readings	Graphic Log	Sample Description & Classification	H_2O Depth	Remarks
			1D		0-2	24/18	3-7-7-30	PID=2.2 ppm		10" Grassed Topsoil		
										0.8 Medium dense, brown Gravelly SAND some silt with plastic (Fill)		
			2D		2-4	24/10	21-36-20-10	PID=1.4 ppm				
	5		3D		5-7	24/1	5-6-7-8	PID=5.7 ppm		5.0 Medium dense, light gray-light brown Silty fine SAND		
			4D		7-9	24/12	8-9-19-15	PID=8.7 ppm				
										8.0 Medium dense, light brown-orange Gravelly SAND some silt		
	10		5D		10-12	24/12	3-8-9-12	PID=2 ppm				

Bottom of Exploration at 12.0 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 NO.: B- 7

BORING / WELL 18-1709.GPJ SWCE TEMPLATE.GDT 9/19/19

S.W.COLE ENGINEERING, INC.

S.W.COLE ENGINEERING, INC.

BORING LOG

CLIENT: Port One Architects
PROJECT: Proposed Fire Station
LOCATION: 195 Maple St., Somersworth, NH

BORING NO.: B- 8
SHEET: 1 of 1
PROJECT NO. 18-1709
DATE START: 9/5/2019
DATE FINISH: 9/5/2019

Drilling Information

LOCATION: See Exploration Location Plan | **ELEVATION (FT):** N/A | **TOTAL DEPTH (FT):** 12.0 | **LOGGED BY:** Tyler Demers
DRILLING CO.: S.W.Cole Explorations, LLC | **DRILLER:** Corey Culligan | **DRILLING METHOD:** Hollow Stem Auger
RIG TYPE: Track Mounted Diedrich D-50 | **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:** N/A
HAMMER EFFICIENCY FACTOR: | **HAMMER DROP (inch):** 30
WATER LEVEL DEPTHS (ft): No free water observed
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 / PID Readings	Graphic Log	Sample Description & Classification	H_20 Depth	Remarks
			1D		0-2	24/16	3-6-14-14	PID=6.1 ppm		0.2 2" Grassed Topsoil 0.5 Medium dense, gray SAND some silt (Fill) Medium dense, brown Gravelly SAND some silt (Fill)		
			2D		2-4	24/18	14-16-8-7	PID=5.2 ppm		3.0 Medium dense, brown SAND some gravel some silt (Possible Fill)		
	5		3D		5-7	24/14	5-3-4-5	PID=8.6 ppm		5.0 Loose, brown Silty fine SAND		
			4D		7-9	24/12	5-5-4-4	PID=4.9 ppm		6.0 Loose, light gray fine to medium SAND trace silt		
	10		5D		10-12	24/12	3-5-11-17	PID=4.4 ppm				

Bottom of Exploration at 12.0 feet

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BORING NO.: B- 8

BORING / WELL 18-1709.GPJ SWCE TEMPLATE.GDT 9/19/19

S.W.COLE ENGINEERING, INC.

BORING LOG

CLIENT: Port One Architects
PROJECT: Proposed Fire Station
LOCATION: 195 Maple St., Somersworth, NH

BORING NO.: B- 9
SHEET: 1 of 1
PROJECT NO. 18-1709
DATE START: 9/5/2019
DATE FINISH: 9/5/2019

Drilling Information

LOCATION: See Exploration Location Plan
ELEVATION (FT): N/A
TOTAL DEPTH (FT): 12.0
LOGGED BY: Tyler Demers
DRILLING CO.: S.W.Cole Explorations, LLC
DRILLER: Corey Culligan
DRILLING METHOD: Hollow Stem Auger
RIG TYPE: Track Mounted Diedrich D-50
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: N/A
HAMMER EFFICIENCY FACTOR:
HAMMER DROP (inch): 30
WATER LEVEL DEPTHS (ft): No free water observed
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 / PID Readings	Graphic Log	Sample Description & Classification	H_2O Depth	Remarks
			1D		0-2	24/4	2-3-8-8	PID=5.5 ppm		Loose, brown Gravelly SAND some silt (Fill)		
			2D		2-4	24/10	5-3-5-13	PID=16.4 ppm				
	5		3D		5-7	24/10	11-11-10-9	PID=10.3 ppm		5.0 Medium dense, light gray-orange Gravelly SAND some silt		
			4D		7-9	24/2	9-9-7-8	PID=11.3 ppm				
	10		5D		10-12	24/12	3-3-4-5	PID=8.1 ppm		10.0 Loose, light gray Silty fine SAND		

Bottom of Exploration at 12.0 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 NO.: B- 9

BORING / WELL 18-1709.GPJ SWCE TEMPLATE.GDT 9/19/19

S.W.COLE ENGINEERING, INC.

S.W.COLE ENGINEERING, INC.

BORING LOG

CLIENT: Port One Architects
PROJECT: Proposed Fire Station
LOCATION: 195 Maple St., Somersworth, NH

BORING NO.: B-10
SHEET: 1 of 1
PROJECT NO. 18-1709
DATE START: 9/5/2019
DATE FINISH: 9/5/2019

Drilling Information

LOCATION: See Exploration Location Plan | **ELEVATION (FT):** N/A | **TOTAL DEPTH (FT):** 12.0 | **LOGGED BY:** Tyler Demers
DRILLING CO.: S.W.Cole Explorations, LLC | **DRILLER:** Corey Culligan | **DRILLING METHOD:** Hollow Stem Auger
RIG TYPE: Track Mounted Diedrich D-50 | **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:** N/A
HAMMER EFFICIENCY FACTOR: | **HAMMER DROP (inch):** 30
WATER LEVEL DEPTHS (ft): No free water observed
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 / PID Readings	Graphic Log	Sample Description & Classification	H_20 Depth	Remarks
			1D		0-2	24/12	4-5-5-5	PID=6.6 ppm		Loose, brown SAND some gravel some silt (Fill)		
			2D		2-4	24/12	7-13-17-19	PID=8.3 ppm		2.0 Dense, brown Gravelly SAND some silt (Fill)		
	5		3D		5-5.7	8/0	7-50/2"					
			4D		8-10	24/14	3-4-4-4	PID=5.7 ppm		7.5 Loose, gray-light brown Silty fine SAND		
										9.0 Loose, brown SAND trace silt		
	10		5D		10-12	24/12	4-3-4-5	PID=3.6 ppm				

Bottom of Exploration at 12.0 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 NO.: B-10

BORING / WELL 18-1709.GPJ SWCE TEMPLATE.GDT 9/19/19

4.01 SPACE PROGRAMMING

Architectural programming is defined as the research and decision-making process that identifies the scope of work to be designed.

- It involves interested parties defining the scope of work prior to beginning design.
- It emphasizes gathering and analyzing data early in the process so that the design is based upon sound decisions.

Programming is the basis for space planning and building design. Time well spent in this phase yields efficient, effective results through each subsequent phase of the project.

Adjustments to the programmed spaces typically occurs during concept design and design development, but should be finalized by construction documents in order to limit unanticipated impact on schedule and budget.

SPACE NEEDS PROGRAM

	Dimensions	Sq. Ft.	Notes
Apparatus Bays	102' x 78'	7956 sf	5 Drive-thru Bays
Subtotal		7956 sf	
Administration			
Front Vestibule	8' x 8'	64 sf	Aluminum Storefront
Front Lobby	13' x 11'	143 sf	Tile
Public Bathroom	7' x 7'	49 sf	ADA
Admin. Assistant	12' x 11'	132 sf	Dispatch
Admin. Closet	2' x 6'	12 sf	Pole & Shelf
Copy	4' x 11'	44 sf	Counter in Alcove
Office Storage	6' x 8'	48 sf	Shelving
Chief's Office	14' x 12'	168 sf	
Chief's Closet	2' x 6'	12 sf	Pole & Shelf
Deputy Chief's Office	11.5' x 11'	126 sf	
Conference Room	16' x 9'	144 sf	Kitchenette
Shift Officer Office	9' x 12'	108 sf	
Code Office	9' x 12'	108 sf	
Plan Room	9' x 12'	108 sf	
Admin. Toilet	7' x 7'	49 sf	ADA
Training Room	23' x 28'	644 sf	42 Occupants
T.R. Toilet	5' x 6'	30 sf	
T.R. Storage	4' x 13'	52 sf	
T.R. Kitchenette	4' x 13'	52 sf	Kitchenette
Dispatch Office	11' x 11.5'	126 sf	
Mechanical Attic	21.5' x 18'	387 sf	Air Handlers
Janitors Closet	3' x 6.5'	19 sf	Mop Sink
Subtotal		2,625 sf	

SPACE NEEDS PROGRAM (CONT.)

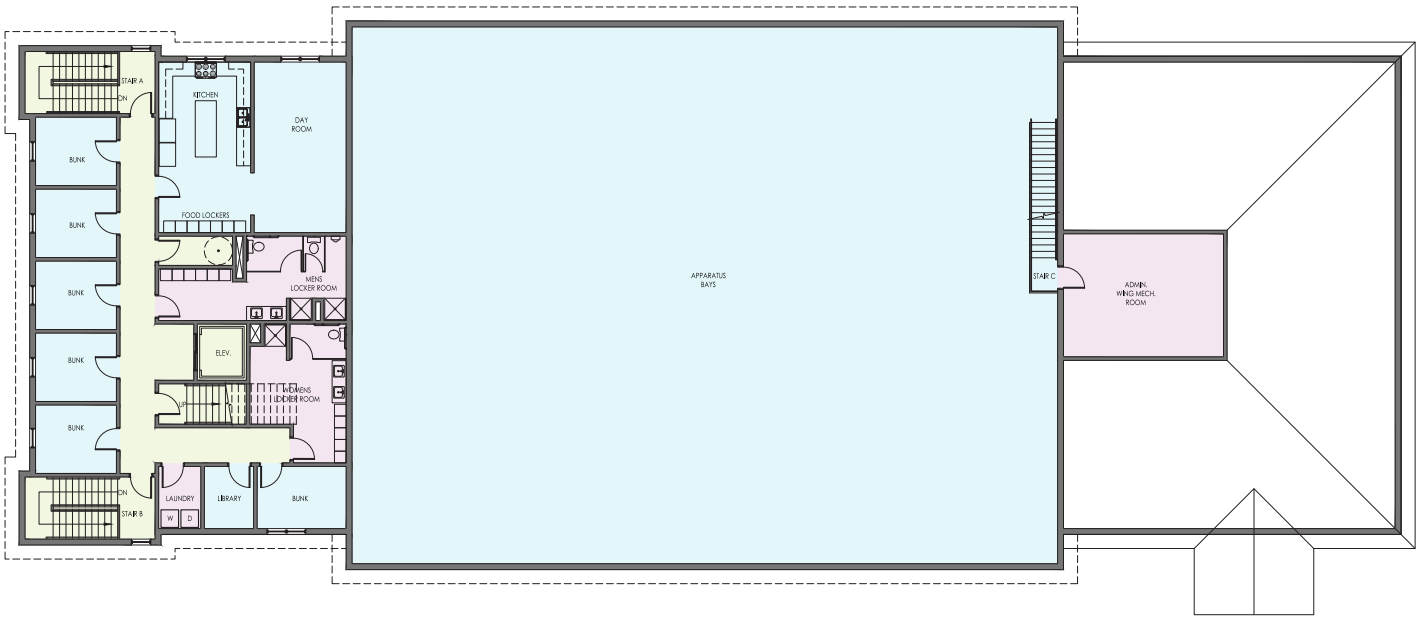
	Dimensions	Sq. Ft.	Notes
Operations Support			
General Storage	12' x 16.5'	198 sf	
Janitor Closet	3' x 6'	18 sf	
Janitor Storage	3' x 6'	18 sf	
Fitness Room	14' x 16.5'	231 sf	Rubber Floor
Hose Storage	6' x 16.5'	99 sf	
SCBA	9' x 16.5'	148 sf	Cascade System
Maintenance	14' x 13'	182 sf	Bench
Gear Room	22' x 21'	462 sf	42 Gear Racks
DeCon	8' x 21'	168 sf	Extractor
H/C Toilet	8' x 9.5'	76 sf	
Elevator Machine Room	7' x 5.5'	38 sf	
Medical Storage	13' x 6'	78 sf	Cabinetry
Mech. / Elec.	13.5' x 16.5'	223 sf	
Sprinkler Room	7' x 9'	63 sf	
Subtotal		2,002 sf	

Operations Staff			
Kitchen	15' x 23'	345 sf	Including W/D
Day Room	11' x 23'	253 sf	Food Lockers
Pole	11' x 4'	44 sf	ADA
Men's Locker Room	Varies	356 sf	ADA
Women's Locker Room	13' x 11'	143 sf	ADA
Library	7' x 9'	63 sf	Counter
Laundry	6' x 8'	48 sf	Shelves
Bunk Room	9.25' x 11.5'	106 sf	2 Occupants
Bunk Room	9.25' x 11.5'	106 sf	2 Occupants
Bunk Room	9.25' x 11.5'	106 sf	2 Occupants
Bunk Room	9.25' x 11.5'	106 sf	2 Occupants
Bunk Room	9.25' x 11.5'	106 sf	2 Occupants
Bunk Room	8' x 16'	128 sf	1 Occupants
Stair to Attic	5' x 11'	55 sf	Overrun
Mechanical Attic	20' x 20'	400 sf	Air Handlers
Subtotal		2,365 sf	

SPACE NEEDS PROGRAM (CONT.)

		Dimensions	Sq. Ft.	Notes
Circulation				
Stair A	1st Floor	8' x 17'	136 sf	Egress
Stair B	2nd Floor	8' x 16.5'	132 sf	Egress
Stair A	1st Floor	8' x 16.5'	136 sf	Egress
Stair B	2nd Floor	8' x 16.5'	132 sf	Egress
Elevator	1st Floor	8' x 7'	56 sf	3500# Model
Elevator	2nd Floor	8' x 7'	56 sf	3500# Model
	Subtotal		648 sf	
	Net SF		15,596 sf	
Corridors, Walls, Chases, Voids		13%	2,332 sf	
	Gross Total SF		17,928 sf	

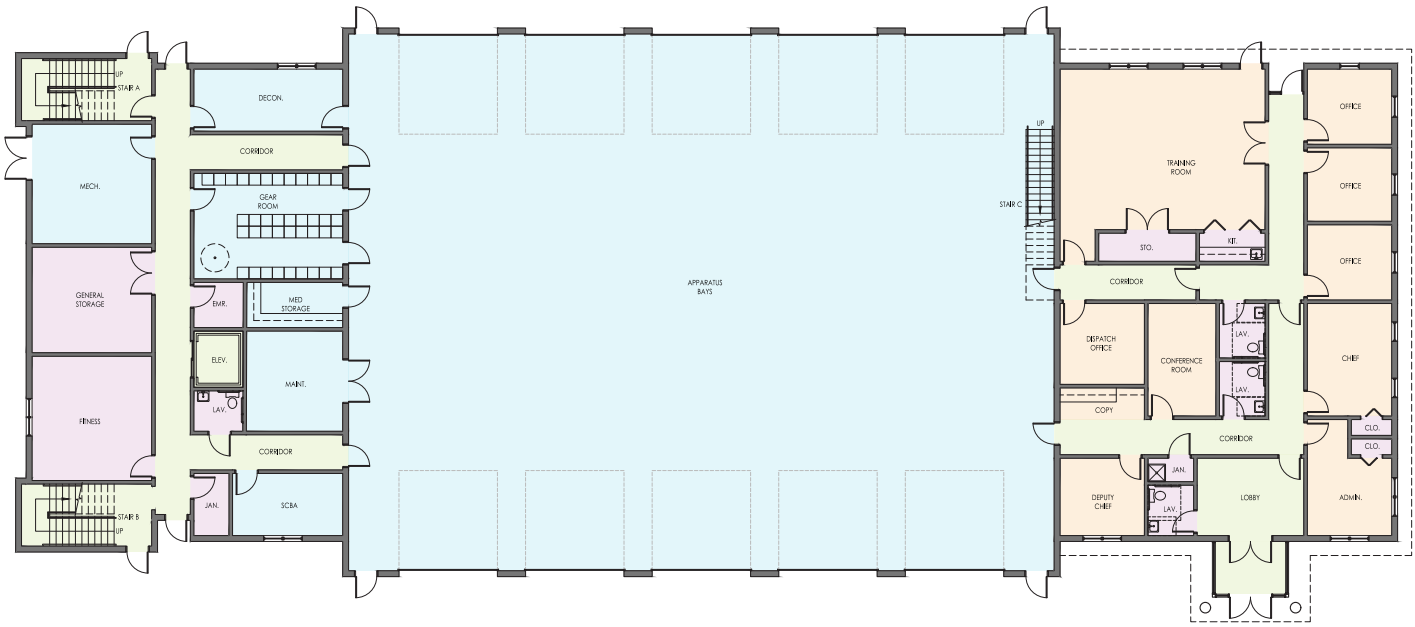
PROGRAMMATIC DIAGRAMS (CONT.)



Second Floor Colored Plan
Not to Scale

Legend:

CIRCULATION
SUPPORT
OPERATIONS
ADMINISTRATION



First Floor Colored Plan
Not to Scale

5.01 CONCEPTUAL DESIGN

DESIGN PROCESS

Our approach began with an initial kickoff meeting held to create an overview of the goals of the study and a schedule to accomplish those goals. Based on a review of existing reports and direct feedback from City Representatives, it was determined early that a new station would be constructed on the existing Maple Street site

The Design Team introduced the concept of constructing the new station in phases and discussed the objectives for each phase. A preliminary schedule was developed based on an initial phasing plan.

- Discussed options of construction delivery: Design/Bid/Build vs Construction Management
- Discussion on timing of construction during a calendar year and best time to receive bids from subcontractors

Subsequent meetings were held to review information as it was developed by the Design Team

- Preparation of the present station's existing conditions including plans and elevations
- Photo documentation of the building, space use and systems
- Compiled existing site information including City tax maps and site plans
- Toured the building with engineers for evaluation of structural and MEP/FP systems

Engaged geotechnical engineer to assess site conditions and schedule site borings

- Defined the edge of the adjacent City landfill
- Conducted soil borings and identified existing utility locations
- Reviewed results with City

Began concept site drawings with potential sites for new construction

- Reviewed three possible site designs and moved forward with preferred option
- Started to assemble the space program into groups of uses and how they could be organized on the site
- Met with civil engineer to review concepts and existing conditions

Prepared concept building footprint location that responded to the site

- How will truck and vehicle circulation work
- Set the main entrance near Park View Terrace and set station personnel entrances

DESIGN PROCESS (CONT.)

- Designed parking to be near entrances
- Determined that the apparatus bays were drive-thru and designed appropriate vehicle aprons

Developed concept floor plans and elevations

- Developed the concept of central apparatus bays with a two-story Operations wing and one-story Administrative wing

Prepared building massing studies and concept elevations

- Review of precedents and traditional aesthetics/massing
- Review building materials, OH doors, windows and other construction materials

Prepared a presentation to the City Council's Public Safety Facilities Committee

- Presentation included plans, elevations, perspective, revised program

Engaged cost estimator

- Met with estimator and reviewed project scope, concept design and materials/methods
- Received final cost estimate with allowances

Continued refinement of concept design

- Discussions on "hot" zone design
- Discuss preliminary cost numbers

Received engineer's narrative on concept design for inclusion in report

Began compiling and finished Concept Design Report

Conceptual Perspective

CONCEPTUAL EXTERIOR ELEVATION

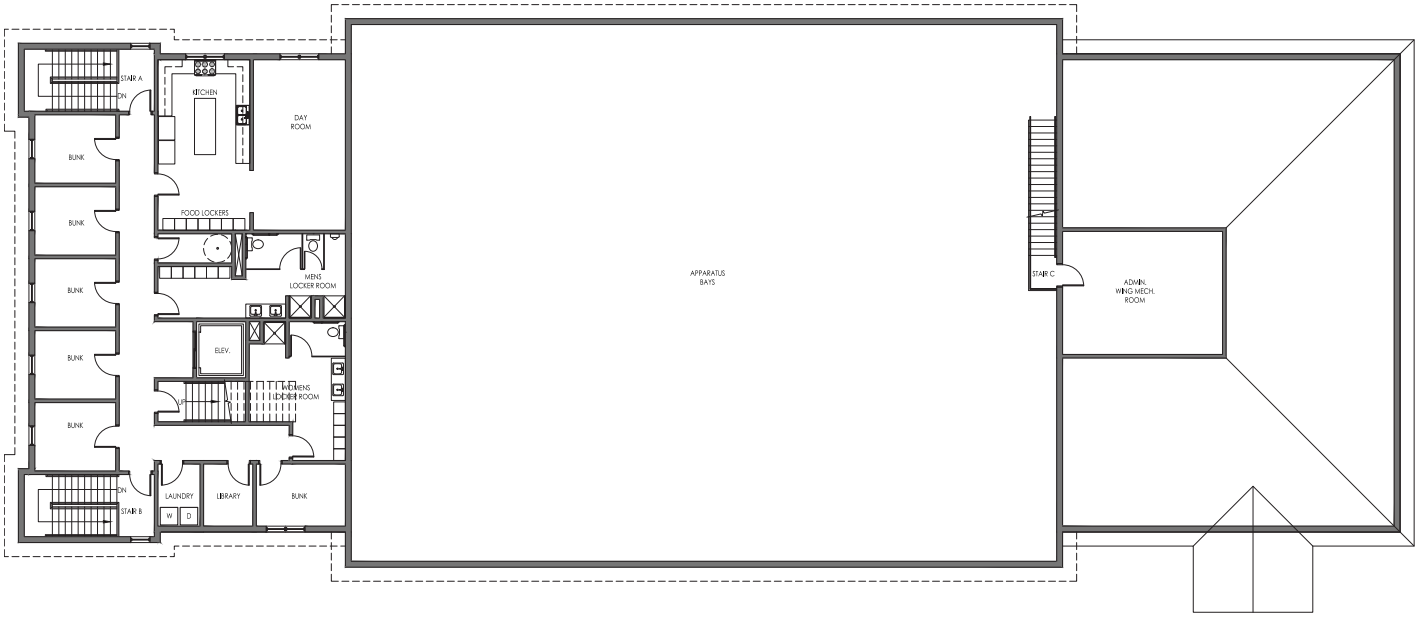
CONCEPTUAL EXTERIOR ELEVATION
Northeast Elevation

Conceptual Exterior Elevation
Northwest Elevation

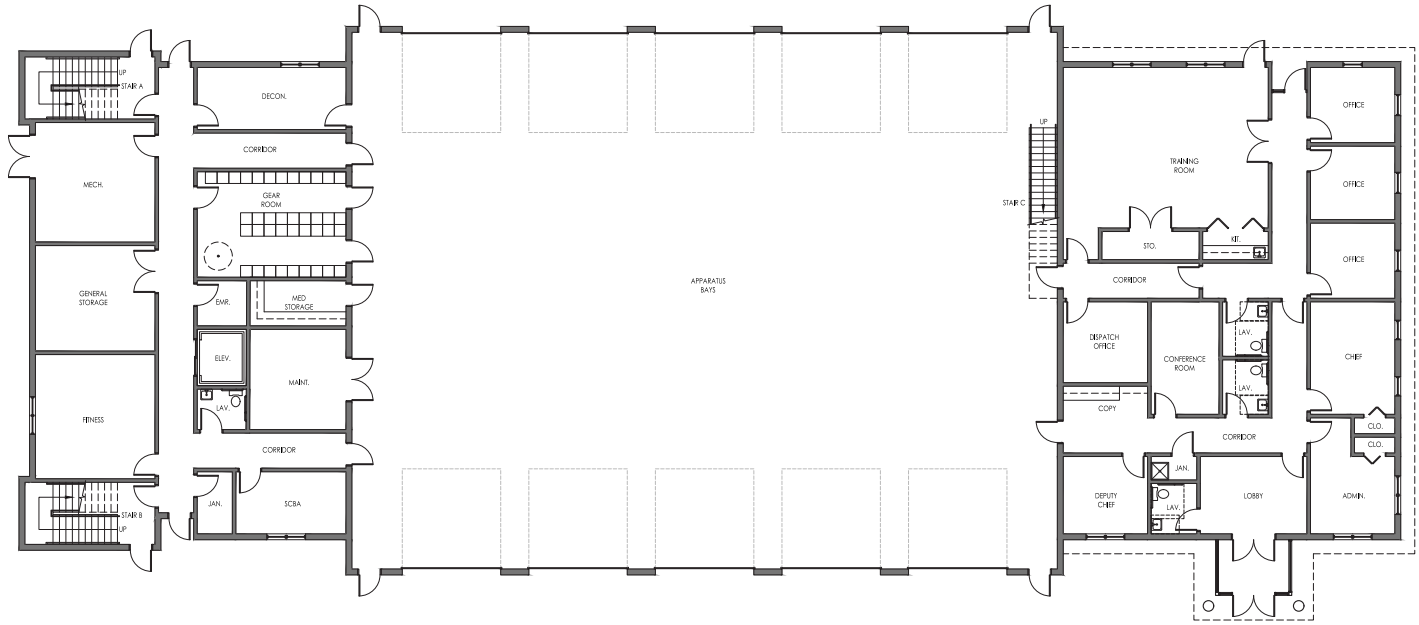
Conceptual Exterior Elevation
Southwest Elevation

Conceptual Exterior Elevation
Southwest Elevation

CONCEPTUAL FLOOR PLANS

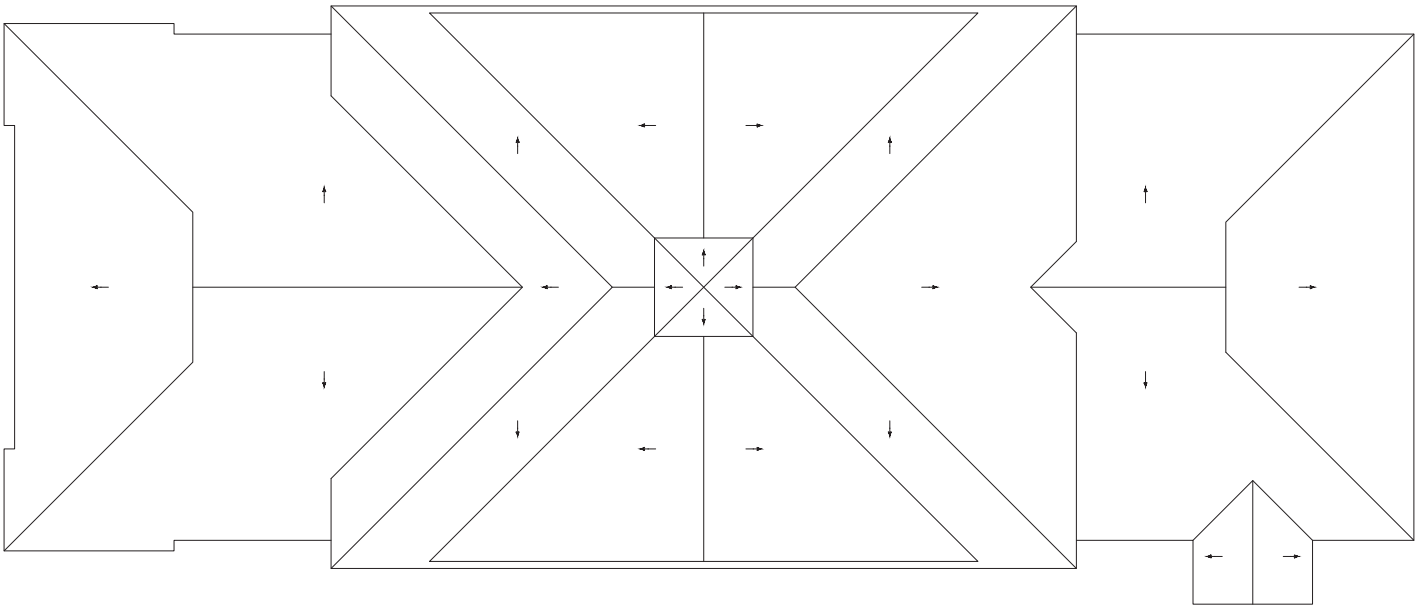


Conceptual Second Floor Plan
Not to Scale

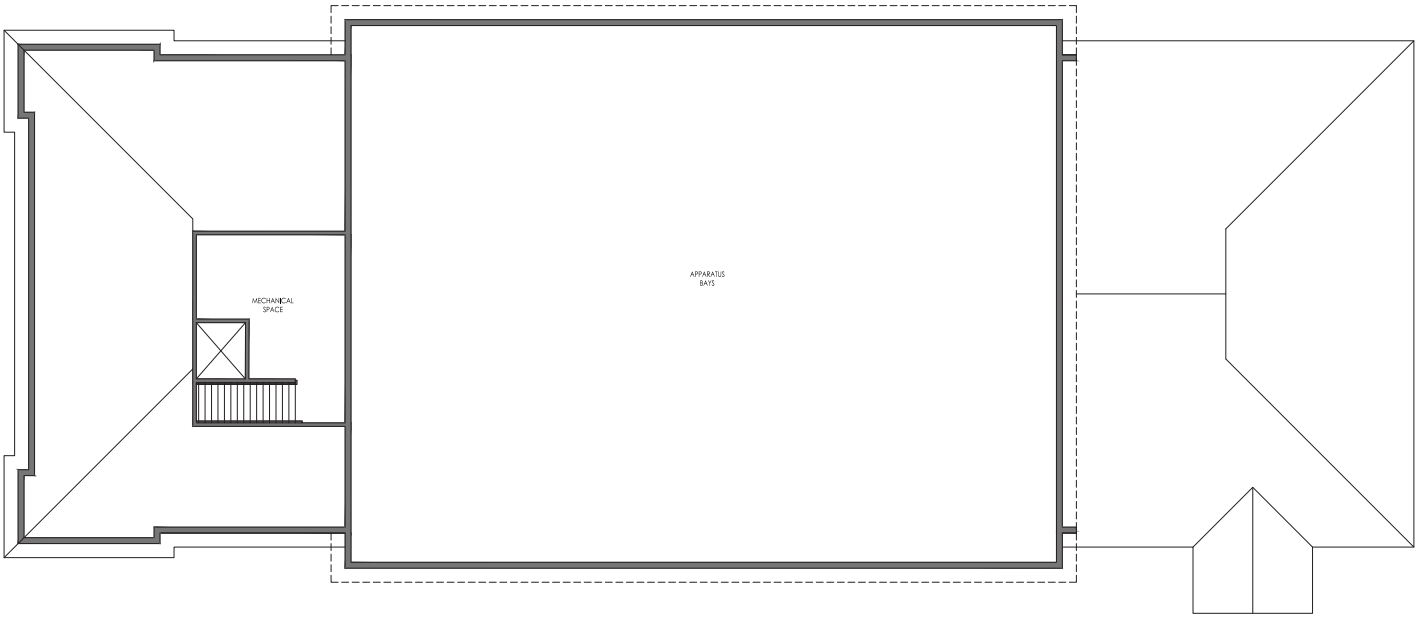


Conceptual First Floor Plan
Not to Scale

CONCEPTUAL FLOOR PLANS (CONT.)



Conceptual Roof Plan
Not to Scale



Conceptual Third Floor Plan
Not to Scale

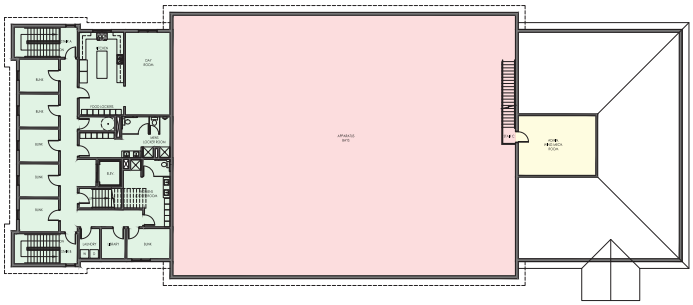
HOT ZONE DESIGN

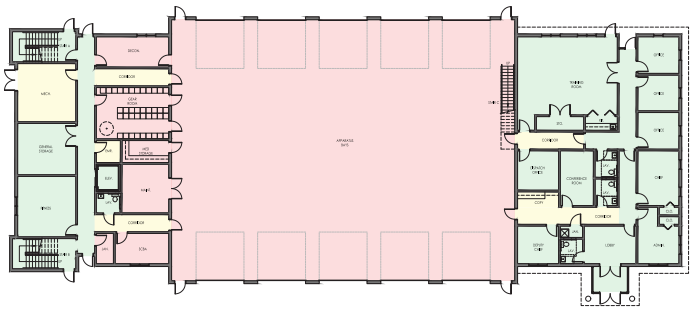
There is increasing awareness of fire fighter exposure to cancer causing agents including a host of chemicals, diesel exhaust and diesel particulate matter. Sources of the contaminants include structure fires, dumpster fires, stove fires, auto fires and diesel fueled fire trucks.

It is critical to control and contain contaminant exposure. Architects are incorporating techniques in fire station design to separate the building into different zones: hot, transitional and cold. The basic premise is to arrange space in such a way as to contain contaminants.

Examples of "hot" zones are the apparatus bays, SCBA repair and cleaning areas, decontamination rooms and firefighter gear rooms. Any fire station spaces that contain apparatus, tools, equipment or personal protective equipment (PPE) used in emergency response are classified as spaces where carcinogens are present.

Transitional zones are usually low hazard areas that act as buffers between hot zones and fire fighter living quarters. These zones include corridors, mechanical/electrical rooms and other ancillary spaces such as vestibules, air locks, storage rooms and storage. Cold zones are fire fighter living quarters and support spaces.





Hot & Cold Zone Floor Plan Diagrams
Above: Second Floor Plan
Below: First Floor Plan

Several strategies segregate these zones from each other. The decon room will contain a gear extractor and a dryer for fire fighter gear cleaning and maintenance. Additionally personnel showers, sinks and eyewash stations are included in the station design. Apparatus bays will have diesel exhaust systems that couple directly to vehicle exhaust pipes to-vent fumes and particulates to the outside.

Importantly, is the segregation of HVAC systems for each zone that exhaust directly to the outside and do not mix air between zones.

Educating fire fighters of cancer awareness and prevention is critical.

6.01 PHASED CONSTRUCTION

MATERIAL OUTLINE SPECIFICATION

A description of building systems and materials to be used in the new construction can be found in the engineering narratives and listed below.

Site work is described in Hayner Swanson, Inc. narrative. Foundations, slabs, floor/ceiling assemblies, bearing walls and roof framing is described in the JSN's structural narrative. Refer to the MEP/FP engineering narrative for mechanical, plumbing and electrical systems.

Interior partition walls are either 4" or 6" metal studs with gypsum board installed on both sides or 6" to 8" concrete masonry units (CMU) painted. Finishes include acoustical ceiling, carpet and vinyl floors. Interior doors will be solid core birch.

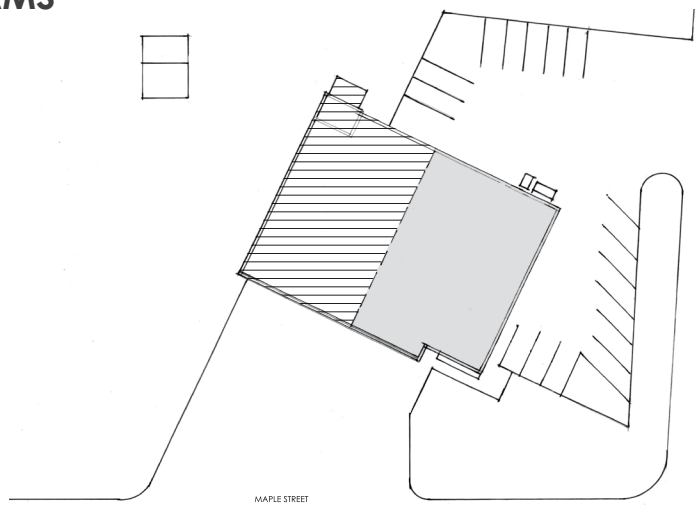
The exterior will either have a brick veneer with precast concrete accents and trims or cementitous siding. The roof will be 30 year asphalt shingles.

Overhead doors on the Maple Street elevation will be bi-parting four fold doors with storefront transoms above. The overhead doors on the rear of the building will be insulated steel sectional doors. Exterior passage doors are insulated steel. Entry vestibules will be aluminum storefront. Exterior windows will be aluminum clad wood.

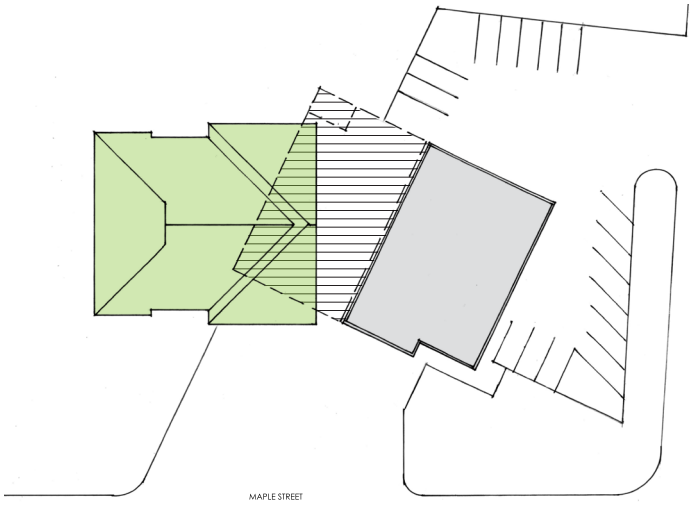
The building is insulated to meet the requirements of the 2015 International Energy Conservation Code (IECC).

Photo Examples
Different examples of construction materials discussed in the Material Outline Specification.

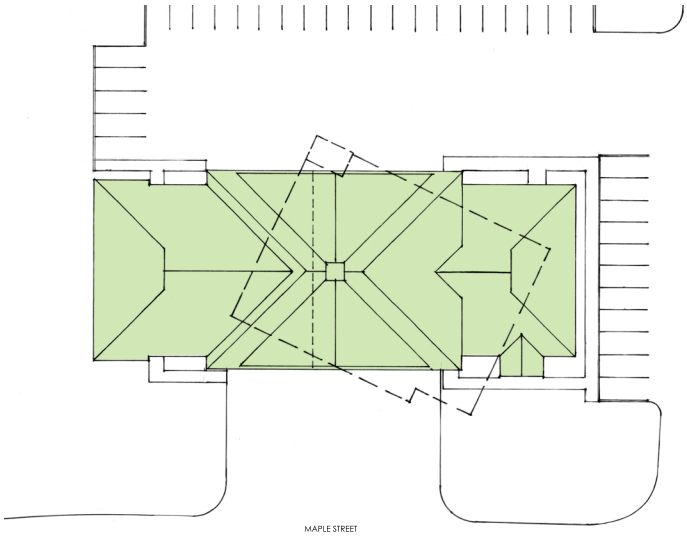
PHASED CONSTRUCTION DIAGRAMS



Existing Conditions Diagram
"Hatched" area to be demolished



Phase 1 Construction Diagram
(Grey) Portion of existing station to remain. (Green) Portion of new station to be constructed. The operations wing with two new apparatus bays.



Phase 2 Construction Diagram
(Green) Completed station showing connected Operations wing, Administration wing and Apparatus Bays

PHASED CONSTRUCTION

The proposed fire station will be constructed in two phases. The fire department will operate 24/7 during construction and the department and construction crews will have daily contact and weekly meetings to address issues and plan ahead to avoid conflicts.

EXISTING CONDITIONS

The current station consists of a two-story operations/ administration wing attached to five doubled drive-thru apparatus bays. To begin the construction process a temporary metal stud bearing wall will be built between the second and third double bays. With the temporary wall in place the south side portion of the building, the third, fourth and fifth apparatus bays, will be demolished. Sprinkler lines will be capped, HVAC systems and bay exhaust reconfigured and electrical/ lighting repositioned. This will give the department the continued use of the operations/ administration wing and two double drive-thru bays. Existing parking, front apparatus apron and vehicle circulation will remain in place.

PHASE 1 CONSTRUCTION

With the southern half of the existing station removed the required reworking of existing utilities and the installation of new utility lines will begin. Additional site work will take place for building foundation and site drainage.

The portion of the overall building constructed in Phase 1 is the two-story operations wing and two attached apparatus bays. This will provide more than adequate space for the fire department to move into once completed.

PHASE 2 CONSTRUCTION

Once Phase 1 is complete the fire department will move in and continue to operate 24/7 out of the new space. The final Phase 2 will consist of demoliching the remaining older station, the existing utilities and installing new utilities. Preparation for building foundation will occur and the remaining second of the new station will be constructed, including all new parking, access drives, sidewalks and front apron.

PRELIMINARY CODE REVIEW

Basic Code and Fire Rating Information

IBC 2015 and NFPA 101 2015

General Project Description

This project consists on the construction of a new fire station for the City of Somersworth NH. The five double-stacked, drive-thru apparatus bays will have an Administrative wing on the southwest side and a two-story Operations wing on the southeast side. The Operations wing will be two story with a mechanical attic and the Administration wing will be one story with a mechanical attic.

Building Data

Occupancies: B (Business), R-2 (bunk rooms), S-1 (moderate -hazard storage) and S-2 (low-hazard storage)

Building Height in feet: Approximately 35'-0" average grade to mid slope of highest roof

Number of Stories Above Grade: Two

Footprint area: 14,419 sf

Construction type: V-B Combustible, unprotected.

Excess street frontage: Not required for area limitation compliance

Sprinkler system: NFPA-13

Height and Area Limitations

Height limitation:		
Basic limitation:	2 stories, 40'	IBC table 504.3, 504.4
Increase for sprinkler:	1 story, 20'	IBC table 504.3, 504.4
Adjusted height limitation:	3 stories, 60'	
Area limitations:		
Basic area limitation:	21,000sf based on R-2 occupancy: IBC table 506.2	
Sprinkler increase	200% of the final sf: IBC section 506.2.4	

PRELIMINARY CODE REVIEW (CONT.)

Fire Ratings

Basic building elements based on V-B construction type:

Structural frame:	0 hours	IBC table 601
Exterior bearing walls:	0 hours	IBC table 601
Interior bearing walls:	0 hours	IBC table 601
Interior non-bearing walls:	0 hours	IBC table 601
Floor construction:	0 hours	IBC table 601
Roof construction:	0 hours	IBC table 601

Interior fire separations:

Stair (vertical exit enclosures) walls	1 hour fire barrier	IBC section 1023.2
Exit access corridor walls in general business areas:	0 hour fire partition	IBC table 1020.1
Exit access corridor walls at bunk room areas:	½ hour fire partition	IBC table 1020.1
Elevator hoistway:	1 hour fire barrier	IBC section 708.4
Elevator machine room enclosure:	1 hour fire barrier	IBC section 3006
Bunk room ceilings (separation from attic):	½ hour	IBC section 709
Bunk room/bunk room separations (walls):	½ hr fire partition	IBC section 709
Bunk room/other use separations:	1 hour	IBC section 711
Bunk room/corridor separations:	½ hour fire partition	IBC section 709
Apparatus bay/other use separations:	2 hours	NFPA 88A

Openings Protectives

Exit access (stairway/corridor) doors:	1 hour	IBC table 716.5
Elevator doors:	1 hour	IBC table 716.5
Elevator machine room door:	1 hour	IBC table 716.5
Bunk room doors:	1 hour	IBC table 716.5
Doors into bunk room corridors not noted above:	1 hour	IBC table 716.5

ZONING

The Maple Street fire station site sits in the REC recreational zone. From the Zoning ordinance Dimensional and Density Table 5.A.1 is the following:

Minimum Lot Area (Sq. Ft.)	N/A
Minimum Lot Frontage (Sq. Ft.)	N/A
Minimum Yard Requirements (Setbacks)	Front: 10’ / Side: 10’ / Rear: 10’
Maximum Building Coverage (Percent)	5%
Maximum Building Height (Feet)	35’
Maximum Dwelling Units/ Gross (Acre)	N/A

7.01 ENGINEERING NARRATIVES

INTRO TO ENGINEERING NARRATIVES

A highly qualified team of engineers experienced in the fire station design and construction has been assembled for the Somersworth Fire Station project.

SW Cole Engineering Inc. Somersworth, NH
Somersworth, NH, Geotechnical Engineers – Chad Michaud PE

Hayner/Swanson Inc.
Nashua, NH, Civil Engineers - Earle Blatchford PE

JSN Associates Inc.
Portsmouth NH, Structural Engineers – Jeff Nawrocki PE

Yeaton Associates Inc.
Bedford, NH, Mechanical, Electrical, Plumbing Engineers – Ryan Nealley PE

HAYNER SWANSON, INC. CIVIL NARRATIVE

The following information is based on schematic plans of the proposed fire station provided by Port One Architects, and should be considered preliminary. The proposed fire station is to be built on the site of the existing fire station at 195 Maple Street Extension, Somersworth. Phasing will be critical to the project as the site will remain operational during construction of the new fire station. Phase 1 will involve demolishing the southerly (left) portion of the existing firehouse building and constructing the southernmost (left) portion of the new building south of the remaining portion of the existing building. Any existing site improvements within the new Phase 1 building footprint will be demolished or relocated (if required for the remaining portion of the existing firehouse). New sanitary sewer, water, gas, power, and communications services will have to be constructed to Phase 1 portion of the new firehouse building. Phase 2 will involve moving operations from the remaining portion of the existing building to the Phase 1 portion of the new building. The remainder of the existing firehouse building, along with most of the original pavement areas and other site improvements will be demolished. The remainder of the new firehouse building; as well as the majority of the new pavement areas, stormwater management system, landscaping , site lighting, and miscellaneous site improvements will be constructed during Phase 2.

Below is an outline of major sitework items that are anticipated for this project. Item numbers refer to New Hampshire Department of Transportation Standard Specifications.

Utilities:

It appears preliminarily that municipal water and sewer, gas, power, and communications are available in Maple Street Extension and Parkview Terrace and serve the existing firehouse building. It appears that the existing water, sewer, and gas services can be maintained during Phase 1 (described above); but new power and communications services will need to be run overhead from a new service pole to be located on the north side of the existing building to remain. The current power and communications is run overhead from a service pole to the southeasterly corner of the existing building (to be demolished in Phase1). Roof-mounted radio communication equipment is currently located on the northerly end of the building, and shouldn't be adversely affected by the Phase 1 building demolition.

New sanitary sewer, water, gas, power, and communications service will need to be run from either Maple Street Extension or Parkview Terrace to the Phase 1 portion of the new firehouse building. These services will need to be extended inside the building envelope to service the Phase 2 portion of the new firehouse building, or separate services provided during Phase 2. This will need to be determined by the Project Architect and MEP Consultant.

Any current utility system capacity restrictions that may exist are not known at this time.

Parking Lot/Driveway Pavement:

The proposed parking lot and driveway areas, the majority of which will be constructed during Phase 2 of the project, will be paved in two courses (binder course and wearing course) with heavy-duty hot bituminous pavement with the following typical section (subject to final pavement section recommendations by Project Geotechnical Engineer):

- 4.5" Hot Bituminous Pavement (Item 403.11)
- 8" Crushed Gravel Base (Item 304.3)
- 12" Gravel Base (Item 304.2)

Curbing:

- Vertical Granite Curb (Item 609.01 or 601.02) – to be used on main entrance drive and along all sidewalks.
- Slope Granite Curb w/ 2,500 PSI Concrete Base – to be used for remainder of parking lot perimeter.

Poured-in-Place Reinforced Concrete Sidewalks:

- 4" Reinforced Concrete
- 6" Crushed Gravel base (Item 304.3)

Storm Drain System:

Based on the S.W. Cole boring log results, which indicate deep deposits of sand and gravel throughout the 1.0 acre site, we would propose an underground stormwater detention/infiltration system (StormTech or perforated pipe) to mitigate the impacts of increased impervious surfaces proposed by the project. Based on the amount of proposed development, this system (or systems) would likely be placed under proposed pavement areas, with an overflowpipe connection(s) to the existing storm drain system(s) in Maple Street Extention and/or Parkview Terrace.

It is anticipated that the storm drain design will consist of several 5-foot +/- deep (to pipe invert) 4-foot diameter pre-cast concrete catch basins with 4-foot deep sumps connected by underground drainage pipes to the above-mentioned stormwater detention/infiltration system(s). The infiltration units/pipe will be bedded in ¾-inch crushed stone (washed) 1 foot around pipe on all sides. The system will be wrapped in a non-woven filter fabric on the top and sides. It's anticpated that there will be 4 feet of cover over the detention/infiltration system. As with the new pavement areas described above, the majority of the stormwater management system will be constructed in Phase 2 of the project.

Earthwork:

No extraordinary earthwork is anticipated for this project with regard to ledge, high water table, or cuts and fills.

Other site-related considerations for this project are as follows:

Maintaining Firehouse Operational Integrity During Construction:

Because the existing fire station site is only 1.0 acre in size, it will be critical for Fire Department personnel, the design team, and the Construction Manager/General Contractor to work closely together to insure that the construction work proceeds in an orderly fashion while, at the same time, maintaining the operational integrity of the firehouse during all phases of construction. It will be critical to utilize both the right-of-way area abutting the southerly side of the site and portions of the St. Laurence Park land abutting the westerly side of the site; both areas being controlled by the City of Somersworth. These areas should be used for construction employee vehicle and equipment parking, as well as staging and laydown areas for contractors. This will allow for sufficient room around the Phase 1 building construction area. It will also allow the existing apparatus driveway on the easterly side of the existing building, and the existing parking areas on the northerly and westerly side to remain in service for use by Fire department personnel. Consideration will have to be made for temporary gravel parking areas, and temporary walkways as the project transitions into Phase 2 and Fire Department operations are moved from the remaining existing building to the new Phase 1 building.

Low Impact Development (LID) Features to Consider During Planning & Design Phase:

- Sheet flow pavement areas to adjacent bioretention landscape areas (rain gardens).
- Capture roof runoff (rain barrels, cistern) for landscape irrigation use.
- Carpooling with designated carpool parking spaces.
- Provide bicycle rack/storage area for employees who wish to bike to work.
- Provide electric vehicle charging station(s).

JSN ASSOCIATES, INC. STRUCTURAL NARRATIVE

This narrative serves as a general description of the proposed structure for the new Somersworth Fire Station. First, it is important to note that the building will be constructed in two phases to allow some occupancy and use during construction.

In preparation for Phase 1 and partial demolition of the existing building it is our understanding that a full height wall will be constructed in the existing building at a steel column line between apparatus bays two and three. This will serve as a exterior end wall for the existing building while the new Operations wing is constructed. It will remain until the second half of the existing station is demolished.

All new apparatus bays will be constructed with reinforced 12" CMU block walls and the roof will consist of 78' clear-span wood trusses at 24" O/C with 5/8" plywood sheathing. Trusses of this length will need to be erected in pre-braced groups of trusses for safety reasons.

The two-story Operations wing that is part of Phase 1 will be constructed with CMU and brick veneer exterior walls. Interior bearing walls will also be CMU, as well as the elevator shaft and stairs, and other walls could be CMU or metal stud. A steel joist, metal deck, and concrete floor system will be used for the second floor. Stairs will be concrete filled metal pan. Mechanical floor above will likely be framed with wood floor trusses and ¾" plywood bearing on CMU or light gage metal stud walls. Roof construction will be wood trusses at 24" O/C and 5/8" plywood sheathing.

In Phase 2 the Administration wing will be constructed with light gage metal exterior bearing walls and brick veneer. Some interior walls will be 8" or 6" CMU, where durability and rating is desired, and other partition walls will be light gage metal. The mechanical space will be framed with wood floor trusses and ¾" plywood sheathing, and this space is accessed by a steel stair in the apparatus bay.

Foundations are anticipated to be conventional frost walls and footings with strip footings under slab at interior bearing walls. Interior slabs in both wings will be 5" thick 3000 psi fiber reinforced concrete over vapor barrier over prepared subgrade. Apparatus bay slabs will be 8" 4000 psi concrete reinforced with 6x6/W2.9xW2.9 WWF over vapor barrier over prepared subgrade. The geotechnical engineer need to confirm these assumptions and determine if additional ground support is required.

YEATON ASSOCIATES, INC. MEP/FP NARRATIVE

MEP/FP Conceptual Design	
Project Name:	**Somersworth Fire Station**
Project Location:	**195 Maple St. Somersworth, NH**
Document Date:	**December 18, 2019**
YA Project #:	**19049ME**

Executive Summary

Yeaton Associates, Inc. was engaged by Port One Architects to develop construction documents for the proposed addition to and renovation of the Somersworth Fire Station. The goal is to install cost-effective MEP/FP systems while meeting or exceeding the code and the Owner's operational requirements.

This narrative presents the options for the mechanical systems for the Somersworth Fire Department.

All new construction elements and systems will conform to the following:

- The New Hampshire State Building Code
- IBC 2015 (International Building Code)
- IECC 2015 (International Energy Conservation Code)
- IMC 2015 (International Mechanical Code)
- IPC 2015 (International Plumbing Code)
- NEC 2017 (National Electrical Code)
- ASHRAE Standards
- Local Authorities Having Jurisdiction (AHJ)
- All Other Applicable Codes, Standards and State Amendments

Existing Systems

❖ Existing Mechanical Systems

The building is currently heated through the use of hydronic baseboard and unit heaters served by an existing natural gas fired boiler plant. The existing boilers are Peerless boilers, each sized at 345 MBH. They are currently in fair condition and should be expected to be serviceable for the next two years during construction.

Existing Boiler Room

Existing Vertical Unit Heaters

Currently, the building primarily relies on natural ventilation except in the apparatus bays. A Plymovent system is utilized for removal of vehicle emissions. There is no current garage bay exhaust as required by current mechanical code. The equipment is in good working order and should be capable of operation for the next two years.

The building currently has no central cooling system and is cooled via window AC units.

The bathrooms are exhausted via cabinet fans installed in the ceiling and ducted to the exterior. They are in operating condition and should be expected to continue to operate for the two years of construction.

The building does not currently have a direct digital control (DDC) building management system (BMS) and is currently controlled via local controls. There is no network gateway or trending/monitoring capabilities in the current system. The controls are at end of life and shall be removed and replaced but are sufficient to allow operation of the building during construction.

❖ Existing Plumbing Systems

The building is served by an existing domestic water service which is located in the mechanical room on the ground floor. The service is in good repair and should be expected to continue to operate for the two years of construction.

The domestic hot water is produced by two 40-gallon gas fired hot water heaters located in the mechanical room adjacent to the laundry equipment. The equipment is in good repair and should be expected to continue to operate for the two years of construction.

Existing Gas Service

Existing Water Heaters

Existing Fire Service

The existing sanitary service shall remain in place during the construction/renovation of the building.

The existing storm system, including leaders and roof drains, shall remain in place during the construction but be replaced upon completion of the building with a system sized to meet the loads of the larger building.

The existing 2½" gas service is in good condition and should be sufficient to support the building over the next 2 years. The gas distribution throughout the building will have to be adjusted as required to maintain operations.

❖ Existing Fire Protection Systems

The building is served by a 6" fire service which is located in the mechanical room adjacent to the washing machine. It is provided with a double check detector assembly and wet alarm check valve. The piping and head locations appear to be as required per NFPA 13. The service and piping appear to be in good working order and should be expected to continue to operate for the two years of construction and can be reused in the final configuration of the building.

There is no standpipe currently and it will not be required per NFPA 14 or IBC 2015.

The building does not currently require a fire pump and street pressure is sufficient for the sprinkler system.

❖ Existing Electrical Systems

According to the proposed phasing plan, all of the existing electrical systems in the building shall be removed and replaced as part of the renovation/addition. All equipment including HVAC and plumbing shall be electrically disconnected and prepared for removal.

The existing building is served by two (2) electrical services, one (1) at 120/208V, 3 phase and one (1) at 277/480V, 3 Phase. Based on proposed building layout and phasing, the existing 120/208V service shall remain in place during phase 1 construction and allow for operation of existing facility. There will be a phasing wall which will split the facility into two phases. As part of phase 1, the existing 480V service and all associated electrical equipment shall be removed and demolished as required.

Any existing equipment including but not limited to: Tank compressor, generator, lighting Panelboards, etc. shall be made available for first right of refusal by the owner as required.

Existing Gas Fired Generator

Existing Electric Utility Equipment

Existing Fire Alarm Control Panels

Existing Typical Panelboard Installation

Proposed Systems

❖ Mechanical Systems

The building shall be heated by a high efficiency, LP gas fired boiler plant with a minimum output capacity of 800 MBH. Boiler shall be direct vented through using CPVC venting and PVC combustion air for materials. Two (2) inline hot water circulation pumps shall push 160°F water to hydronic terminals through insulated piping. Pumps shall be provided with integral VFD's for operation on ΔP or ΔT. Water temperatures shall vary based on outdoor air temperature, with the temperature increasing as outdoor temperatures fall in the winter. The boiler plant shall be located in the Phase 1 area of construction.

An independent boiler shall be provided to serve a hydronic snowmelt system for the apron. It will be sized for 195 Btuh/SF capacity and shall utilize a 40% propylene glycol/60% water heat transfer fluid to provide freeze protection. It shall operate based on temperature, humidity and snow sensors located in the slab.

Fin-tube radiation shall be used around the perimeter of the occupied spaces, with each space having its own thermostat for temperature control. Miscellaneous hydronic cabinet heaters and unit heaters will be used for heating vestibules, storage areas and bathrooms.

A variable refrigerant volume (VRF) system with heat recovery shall be used to both heat and cool the spaces (similar to the Mitsubishi Hyper Heat; 208V/3Ø/60Hz). The outdoor heat pump shall be operational down to a minimum of -22°F. Ceiling cassette or ducted type fan coils shall be provided in each space and provided with space thermostats. Refrigerant piping shall be pre-insulated copper line sets as provided by the manufacturer. The fin tube radiation shall be controlled as first stage heating.

The ventilation air shall be provided by two (2) dedicated outdoor air systems (DOAS) (similar to Trane Horizons) with energy recovery ventilator's (ERV). The DOAS units shall be gas fired for tempering air to a neutral 75°F for discharge to the building. A rooftop DOAS shall be provided for each half of the building and the unit shall be ducted to the spaces independently of the fan coils. Motorized dampers shall be utilized to provide demand control ventilation as determined by CO_2 sensors in spaces of high occupant loading, the general exhaust for the building, excluding kitchen exhaust, shall be routed to the DOAS for tempering or incoming outdoor air. The space shall maintain a positive pressure relationship to the apparatus bays to reduce contamination of the office and sleeping areas.

Any new ductwork shall be made of galvanized steel and constructed in accordance with the recommendations of the ASHRAE Guide and SMACNA Guide (Current Editions). Any flexible ductwork shall be in lengths no greater than 5'-0" and shall not pass through any fire rated assemblies. Flexible ductwork shall only be allowed in concealed locations.

The apparatus bay will be ventilated by a makeup air unit furnished with a direct fired LP gas furnace. Said unit will be sized to provide heated air equal to 0.75 CFM/SF of floor area at a temperature of 75°F. Unit will modulate as required to match a general exhaust fan serving the space, also programmed to exhaust a code compliant 0.75 CFM/SF. The exhaust fan will be programmed to run during occupied hours, or on a high CO/NOx alarm generated in the space.

The kitchen area is furnished with a stove. It is anticipated that a commercial style, ducted exhaust hood with fire suppression will be required. A roof mounted, dedicated hood exhaust fan (similar to Captiveaire) will be provided to run when manually engaged and shall modulate its air flow based on the ΔT between the exhaust air and the space temperature to reduce outdoor air needs. Make up air shall be provided to the kitchen via a motorized control damper off of the DOAS which shall modulate per space pressure differential when the hood is in operation. The hood shall be provided with a cold air damper to prevent infiltration during heating season.

A radiant floor heating system shall be provided to heat the apparatus bay and shall be served from the new boiler plant. Additional quick response heat in the apparatus bay shall be provided by hydronic unit heaters sized to quickly warm up the space after opening of garage doors.

A vehicle exhaust system by Plymovent or equal shall be furnished, with a flexible hose drop serving each parking spot in the apparatus bay. Pneumatic tailpipe nozzles will be attached to each hose, with hoses fixed to tracks high in the space. The tracks will allow the hosing to move and adjust to the vehicle's tailpipe location. A single vehicle exhaust fan shall collect fume and exhaust them through a discharge stack located outside the apparatus bay. Sizing of equipment shall be as per the equipment manufacturer.

Any data/communications closets shall be provided with a split DX wall hung unit for cooling. The condensing unit shall be located on the roof and provided with a low ambient kit for low temperature operation. Refrigerant piping shall be pre-insulated copper line sets as provided by the manufacturer.

A new DDC BMS shall be provided similar to a Niagara Version 4 system. The new system shall be provided with a network gateway, remote monitoring, and trending capabilities. The system shall be open source and allow for modification and extension by third parties. The system shall control the occupancy schedule and all zone set points. Limited zone control of +/-2°F shall be provided in the space with a 3-hour reset to default. The system shall be located in the new mechanical room. This shall be installed and made operational and shall be extended to the area under Phase 2 upon completion of construction.

❖ Plumbing Systems

Domestic hot water to be generated to two (2) HTP Phoenix PH-199-119 high efficiency LP gas fired domestic water heaters with hot water recirculation and pump(s). Water heaters shall be direct vented, with CPVC venting and PVC combustion air terminating above the roof. All domestic hot, cold and recirculation piping shall be hard copper, type L, with soldered fittings. Pro-press fittings may be acceptable pending Owner review. Valves and specialties shall be lead free construction.

Exterior hose bibbs are to be installed at main entryways. Interior hose bibbs will be provided in the apparatus bays and will be piped with both hot and cold water for washing of trucks.

A compressor shall be located in the mechanical room including all required appurtenances. Compressed air drops will be provided throughout the apparatus bays for vehicles and service locations. Exact number and locations to be coordinated with the department during the design period.

Trench drains will be located in each apparatus bay, running from east to west. Trench drains to be heavy duty grade with steel construction by Zurn or equal. A catch basin integral to each trench will be trapped, vented and piped to a 550 gallon oil/water interceptor with high water alarm controls. Tank is proposed to be located to the west of the apparatus bays, near the sleeping quarters.

A new sanitary lateral shall be connected to the site sewer via the site contractor.

A dishwasher is to be installed in the kitchen area, and is anticipated to be under counter type. Water temperature boosting is not anticipated to be required.

❖ Fire Protection Systems

The existing 6" fire service with double check detector assembly shall be replaced with new to be located in the Phase 1 portion of the building. The existing service shall remain in operation during the Phase 1 construction to serve the occupied portion of the building. The piping and head locations shall be as required per NFPA 13. During construction piping serving the occupied portion of the building shall be valved and capped at the dividing wall for connection to the new piping in Phase 1.

A dry pipe valve shall be provided to serve the unheated attic.

There is no standpipe currently and it will not be required per NFPA 14 or IBC 2015.

Sprinklers shall be provided throughout the building as per NFPA 13. The existing fire department connection shall be relocated as required.

The existing fire protection system did not require a fire pump and it is expected that the proposed building shall not require a fire pump either. As there are no record hydraulic calculations, a hydrant flow test shall be undertaken by the owner to ensure current street pressure is sufficient for the expanded building system.

❖ Electrical Systems

Based on preliminary electrical load calculations performed, the design shall include a new 1000 ampere, three phase/four wire electrical service, at 120/208 volts. New electrical service shall be underground from an as yet determined utility riser pole, and to a pad mounted transformer. Utility coordination will be provided at the beginning of the project to move forward on design.

Provide a 1000Amp distribution panelboard with a main circuit breaker and additional distribution circuit breakers to feed sub panels and HVAC equipment as required. The 120/208 volt panelboards to serve 120 volt lighting and 208 volt rated HVAC equipment. As a minimum, provide two 225 ampere 120/208 volt sub-panelboards, one for lighting and plug load power and one for the HVAC and miscellaneous equipment. The main panel will provide support for HVAC equipment.

All work under this section shall fully comply with requirements, rules and regulations of agencies having jurisdiction.

Code references: NFPA 70, 101, 110. IBC

❖ Emergency Backup Generator

The existing gas fire emergency generator will be replaced with a new estimated 225KW (120/208V,3P,4W) gas fired unit to provide backup power for the entire facility. The new unit shall be sized with all new HVAC and proposed electrical loads by a manufacturers representative for accurate sizing. A new interior mounted automatic transfer switch shall be provided as required. At this time, the generator is only picking up "stand-by" loads. The emergency lighting and fire alarm system shall be on battery backup and not considered Life Safety power connections on the generator.

❖ General Lighting & Emergency Lighting Systems

Interior lighting associated with the building construction program shall be provided as LED with 1% dimmable capabilities. The main garage area shall be provided with pendant "high bay" style LED fixtures. Recessed 2x2 and 2x4 lay-in volumetric-direct/indirect LED for suspended acoustic ceiling applications as required. "Back of house"/utility areas with no ceilings will be provided with chain suspended lens linear LED strip lights. LED product shall be provided at no less than 100 lumens per watt with limited exceptions. Where available, lighting shall be 120 volts.

General illumination levels will be provided at no less than 30 dimmable, foot-candles average maintained, for offices, kitchen area, meeting rooms, and similar occupancies. 50 foot-candles will be provided for specific room occupancies, children's library, circulation and open reading areas. Corridors and similar non-public spaces will be provided with 20 foot-candles average maintained. Additional lighting will include accent lighting for displays and to create visual interest.

Emergency Lighting will be provided for all the components of the path of egress from the building, including but not limited to: egress corridors, egress access and path to the public way in accordance with Life Safety Code. Emergency lighting will be provided and installed as emergency battery powered product, consisting of a LED fixtures with integral batter back-up drivers. Exit signs will be provided as self-contained LED, and will be located to identify the path of egress to the public way.

Lighting control will be provided with wall mounted switches in conjunction with occupancy/vacancy sensors. A relay based panel will be provided to control common area and corridor lighting based on time of day occupancy. Strategically placed override controls will be provided at high traffic entry locations.

The building mounted and site pole mounted exterior lighting systems shall be installed as LED.

❖ General Building Wiring

The entire facility shall be provided with new electrical devices in general along with area specific devices to serve the needs of the library. The following line items are more specific to each area:

- Provide convenience receptacles throughout the renovated interior building, with no area less than 40 feet from a receptacle.
- 20 ampere dedicated receptacles and circuits for refrigeration equipment associated with kitchen.
- Provide recessed floor boxes with 120V power and telcom devices.
- Provide GFCI outlets for bathrooms and locations adjacent to the sinks.
- All receptacles within 6 feet of a sink shall be GFCI protected.

- Provide exterior weatherproof, GFCI receptacles for service areas and at HVAC locations as required, and one receptacle on each side of the Library (6 total devices).
- Provide equipment power connections for owner provided equipment.
- Provide power and receptacles for miscellaneous equipment, including but not limited to: Flat Screen Monitors, Wireless Access Points and UPS Systems.
- Provide communication space with power for equipment.
- Branch circuit wiring for 208 volt, HVAC Equipment, 208 volt fan coils and Plumbing equipment described elsewhere in this document.
- Branch circuit power wiring for Building Automation HVAC controls.

Building wiring will be provided as conductors in conduit for exposed wiring and homerun wiring from panelboard to first outlet box. Wiring concealed in framed walls and above lay-in ceilings shall be installed as MC Cable, with a full size green, insulated equipment grounding conductor. Wiring shall be #12 minimum. Conduit shall be minimum ¾". All feeder and branch circuit wiring shall be installed as copper.

❖ Telecommunications

The ground level shall be provided with a dedicated tel/com closet. Provide new telecommunications entrance with empty utility sized underground conduits to new riser pole. Coordinate all work with the utility.

The new closet/room shall contain new tel/com rack system which includes patch panels and routers as required. Provide Local Area Network copper horizontal cabling. Wiring shall consist of but not limited to: jacks, faceplates, patch panels, termination blocks, CAT 6 copper horizontal cables, and associated equipment required to support the installation, including racks, cable tray, conduits and pathways. Horizontal cabling will be unshielded CAT 6. All data shall be run back to a designated location.

Communication drops will be provided in offices and similar occupancies including but not limited to: A minimum of two copper data drops for each desk/chair location.

❖ Security and Access

Provide wiring and equipment to extend the existing security and access control system for door access and handicapped entrances.

❖ Grounding and Bonding

Provide a new central ground bar located in the new electrical room to terminate grounding electrode conductors.

❖ Fire Alarm System

Provide a new addressable fire alarm system with the main control panel located within the main electric room and remote annunciator at the main entry. New exterior beacon and recessed key box shall be provided at main entry and meet the requirements of the local fire department.

Pull stations will be provided at each exterior door location, smoke and heat detectors and audio/visual devices will be provided throughout as required per NFPA and Life Safety Codes.

Phase 1 Operations

❖ Mechanical Systems

The existing boiler plant shall remain in operation serving the occupied portion of the building and shall be valved and capped at the separation wall. All unit heaters and mechanical equipment located on the occupied side of the dividing wall shall remain operational. The piping in the demolished portion of the building shall be disconnected from the system drained and removed for replacement with proposed equipment.

The existing Plymovent system shall be left operational but shall be restricted to only the occupied portion of the building. It will require revisions to the duct work and potentially some relocation of portions of the system.

❖ Plumbing Systems

The existing domestic water service and domestic hot water system shall remain in place and operational during Phase 1. All piping shall be cut and capped at the dividing wall.

The existing gas service shall remain to serve the existing equipment during Phase 1.

The existing sanitary service shall remain in use during Phase 1.

❖ Fire Protection Systems

The existing fire service shall remain in service for the occupied section of the building during Phase 1 and the pipes shall be cut and capped at the dividing wall.

❖ Electrical Systems

The existing building 120/208V electric service shall remain in place during phase 1 construction and allow for operation of existing facility. There will be a phasing wall which will split the facility into two phases. As part of phase 1, the existing 480V service and all associated electrical equipment shall be removed and demolished as required.

Phase 2 Operations

❖ Mechanical Systems

The new boiler plant installed during phase 1 shall be in operation and the original boiler plant shall be removed. Piping from the new boiler plant shall be left valved and capped for connection to the Phase 2 portion of the building. All the existing equipment from the Phase 1 portion of the building shall be removed and replaced as per the design,

The new Plymovent system installed in Phase 1 shall be shall be capped at the dividing wall for extension to the Phase 2 area once completed.

The ventilation and other HVAC systems installed in Phase 1 shall operate to maintain the completed portion of the building during the construction of Phase 2.

❖ Plumbing Systems

The existing domestic water service and domestic hot water system shall be removed and the completed Phase 1 portion of the building shall operate off of the new services and equipment in that side of the building. The domestic water and fire piping shall be valved and capped ready for expansion into the completed Phase 2 portion of the building.

The existing gas service meter location shall be relocated as required to coordinate with the Phase 2 construction. Gas piping serving the equipment in Phase 1 shall remain during the construction of Phase 2.

The existing sanitary service shall be abandoned and the Phase 1 portion of the building shall operate on the new service provided during Phase 1 construction.

❖ Fire Protection Systems

The new fire service installed during Phase 1 shall serve the completed portion of the building and shall be valved and capped at the dividing wall for expansion into the Phase 2 portion of the building.

❖ Electrical Systems

All new electrical equipment shall be provided as noted above for Phase 2. Electrical systems spare capacity shall be utilized as designed for Phase 1 for Phase 2. The majority of the electrical “front end” work will be installed as part of Phase 1 (distribution equipment, panelboards, fire alarm system, tel/com, etc.).

Potential Sustainable Options

❖ Geothermal Bore Field

The geothermal bore field option shall consist of (18) 500-foot deep wells to be provided in the rear of the building. An exterior below ground manifold vault shall be provided for collection of the geothermal strings, connecting to a pair of 4-inch supply and return pipes which run back to the building. The well field consists of 2 strings of 9 wells located a minimum of 20' apart. This can be incorporated with the VRF and the DOAS systems by specifying them as water source. It would allow the equipment to operate in its most efficient operating temperature year-round for reduced operating costs. A geothermal system in areas that are serviced by natural gas typically do not provide an annual operating cost savings with natural gas below $1.15 a therm and the current blended rate per the provided bills is $1.05 a therm. Based on the low natural gas rate geothermal will likely have an ROI at or above 20 years with a significant upfront cost. This is mostly due to our climate being primarily in heating which is provided inexpensively thru natural gas. If desired Yeaton Associates can complete and provide a Life Cycle Cost Analysis if this is an option that is strongly considered.

If a geothermal system is ultimately included in the project it would require minimal changes to the previously described systems beyond the following changes: Water Source VRF units to replace Air Source VRF units, Water-to-Water Heat exchanger for hydronic heating, and a switch to water source heat pumps for the DOAS and Makeup Air Units. The boilers would remain for backup heating of the water loop in the case of a failure in the geothermal bore field.

❖ Solar Thermal System

A solar thermal array located on the roof could be utilized to offset domestic water production through the use of ASME storage tanks to preheat the incoming domestic hot water. Based on typical water usage of a fire station it is unlikely that a solar thermal system will have an ROI under 20 years as such it is not recommended as an option.

❖ Solar Photovoltaic System

A Solar PV Array could be installed on the roof and used to offset the electrical energy loads of the building. Depending on the process utilized for purchase and the current incentives available at the time of installation a solar PV system could have a ROI of as little as 10 years or as many as 19 years. It is typically recommended that municipalities look to structure the purchase as a lease to own where the contractor holds ownership of the equipment during the time the tax credits/rebates are in force as the town cannot take advantage of tax credits and then the town buy out the system at 6 years at the greatly reduced cost. This is typically advantageous as the monthly costs are typically structured to be less than the cost purchasing energy from the grid during the period of the lease. It is recommended that the fire department look at implementing this option.

8.01 PROPOSED SCHEDULE & COST ESTIMATING

PROPOSED SCHEDULE

2020

January 21	City Council presentation 6:00pm
February - March	City Council Deliberations - Bond Discussion
March - April	A/E Contract Negotiations Owners meeting schedule proposed
April - May	A/E Schematic Design (SD) Drawings Civil Engineering Site Survey
May	Review of SD Drawings & Civil Design Owner meetings
June	A/E Design Development (DD) Drawings Engineering DD Drawing coordination
June	Interviewing/Selection of Construction Manager (CM) Preliminary CM Cost Estimating
July	Fiscal Year 2021 Project Bonding
August	A/E Design Development (DD) Deliverables Sub Contractor Negotiations
September	Construction Manager (CM) DD Cost Estimate Subcontractor Input and Value Engineering
October - December	A/E Construction Documents (CD) Drawings

2021

January	A/E Construction Documents (CD) 100% Conformed Drawing Set & Specifications
January - February	Subcontractor Formal Bidding Process Owner meetings
February - March	Creation of Guaranteed Maximum Price (GMP) Construction Manager - Subcontractor Selection Planning Board meetings & Approval

PROPOSED SCHEDULE (CONT.)

March	Phase 1 - Demolition and Utilities Owner Ground Breaking Ceremony
May - November	Phase 1 - Building and Site Construction Weekly project meetings / Construction Administration
November - December	Phase 2 - Building Construction Weekly project meetings / Construction Administration Winter Conditions

2022

January - July	Phase 2 - Construction Continued Weekly project meetings / Construction Administration
August	Project Completion

CONCEPTUAL DESIGN COST ESTIMATE

A conceptual estimate is necessary to evaluate the feasibility of any construction project. A goal with concept design is to have a completed concept design scheme, program and cost estimate. The estimate is based on building program, drawings, sketches, renderings, diagrams, conceptual plans and elevations. This information is supplemented with descriptions of soil and geotechnical conditions, utility requirements, foundation requirements and construction type/size determinations.

This estimate consists of two parts; the first being the cost of constructing the site and building; and the second being the project soft costs. Soft costs are not necessarily related to the actual physical site/building materials and labor but are fees and necessary expenses to complete a project. Typically soft costs are 16-20% of the combined site and building costs.

The site and buildings cost estimate is $6,499,930 (Site & Building). Along with this is our projected soft costs budget (18% of hard costs). Combining these two numbers creates the **Total Project Cost**.

Site & Building Costs:	$6,499,930
Estimated Soft Costs:	$1,169,987
Total Project Costs:	**$7,669,917**

Factors affecting the estimates could be construction delays and material cost increases.

SITE & BUILDING CONCEPTUAL COST ESTIMATE

Description	Quantity	Labor Amount	Material Amount	Subcontract Amount	Equipment Amount	Total Amount
1000 GENERAL CONDITIONS						
Project Executive		14,400				14,400
Project Management		77,760				77,760
Supervision		285,120				285,120
Site Survey				2,500		2,500
Travel			2,720		10,800	13,520
Temp Power			3,400		4,000	7,400
Temp Toilet			2,970			2,970
Security Fence				2,475		2,475
Progressive Clean-Up		26,208	16,200			42,408
Signage		910	1,175			2,085
Trailer & Storage		520	15,900		9,725	26,145
Final Clean-Up				6,275		6,275
Data Processing			6,800			6,800
Security and Safety		31,200	1,500			32,700
GENERAL CONDITIONS		***436,118***	***50,665***	***11,250***	***24,525***	***522,558***
	5,081.20 Labor hours					
2000 DEMO & SITE						
Sitework				363,000		363,000
Site Demolition				8,100		8,100
Building Demo				102,720		102,720
Selective Demo		18,200	2,750			20,950
Temp Protection-enclosures		22,906	9,500	2,000	3,400	37,806
Fences & Gates				4,688		4,688
Landscape Maintenance				2,500		2,500
Fine Grade and Hydroseed				1,600		1,600
DEMO & SITE		***41,106***	***12,250***	***484,608***	***3,400***	***541,364***
	640.405 Labor hours					
3000 CONCRETE						
Concrete Footings			19,142	116,000		135,142
Concrete Walls			9,907			9,907
Floor Sub			43,162	100,000		143,162
Site Concrete			2,100			2,100
Set Anchor Bolts		1,914	310			2,224
Exterior Flat Concrete			10,080			10,080
Metal Stair Pans			316			316
WWM			6,422			6,422
Rebar			31,648	17,802		49,451
Vapor Barrier			3,597			3,597
Water Stop			90			90
Concrete Additives			5,625			5,625
Placement Aids			8,400			8,400
Curing		4,283	3,109			7,392
Foundation and Slab Perimiter Insul		5,718	6,041			11,759
CONCRETE		***11,915***	***149,948***	***233,802***		***395,665***
	386.69 Labor hours					

Description	Quantity	Labor Amount	Material Amount	Subcontract Amount	Equipment Amount	Total Amount
4000 MASONRY						
Standard Brick				680,000		680,000
CMU Block 4"						
CMU Block 6"						
CMU Block 8"						
Masonry Rebar						
MASONRY				***680,000***		***680,000***
5000 METALS						
Structural Steel				190,416		190,416
Steel Decking						
Bar Joists						
Bollards						
Stairs/Railings		2,230				2,230
METALS		***2,230***		***190,416***		***192,646***
	73.876 Labor hours					
6000 ROUGH CARPENTRY						
Framing Subcontractor				123,500		123,500
Lifts-Lull-Material Handling		26,000	1,900		39,300	67,200
Fasteners and Adhesives			58,925			58,925
Sills1			3,566			3,566
Stud Walls			6,342			6,342
Blocking		27,382	9,684			37,067
Strapping		3,885	802			4,686
Ply Roof Sheath			21,340			21,340
Roof Trusses		1,641	3,568	104,956		110,165
Truss Bracing			1,337			1,337
ROUGH CARPENTRY		***58,908***	***107,464***	***228,456***	***39,300***	***434,128***
	2,424.461 Labor hours					
6200 FINISH CARPENTRY						
Exterior Doors		22,548	14,159			36,707
Exterior Windows		2,018	619			2,636
Exterior Corners		1,950	297			2,247
Exterior Trims and Blocks		5,512	1,529			7,041
Exterior Rake Systems		15,942	7,563			23,505
Soffits		13,607	3,850			17,457
Int Window Trim		3,120	2,160			5,280
Architectural Woodwork		1,189	4,800			5,989
FINISH CARPENTRY		***65,885***	***34,977***			***100,862***
	1,013.615 Labor hours					

Description	Quantity	Labor Amount	Material Amount	Subcontract Amount	Equipment Amount	Total Amount
7000 THERMAL/MOIST						
Waterproofing				1,677		1,677
Air Barriers		1,763		31,845		33,608
Blown In Insulation Sub				54,533		54,533
Rigid Insulation						
Firestopping				5,000		5,000
Roofing				120,280		120,280
7" Hardi Siding		32,240	21,000		850	54,090
Gutters						
Flashings		2,080		6,000		8,080
Caulking				22,000		22,000
THERMAL/MOI						
ST		***36,083***	***21,000***	***241,335***	***850***	***299,268***
	731.126 Labor hours					
	96.00 Equipment hours					
8000 DOORS & WINDOWS						
HM and Wood Doors		5,850				5,850
HM Frames		4,485	650			5,135
Overhead Doors				202,000		202,000
Aluminum Entrances-Glass and Glazing				78,130		78,130
Aluminum Windows		7,540	27,000			34,540
Pass Windows		130		2,400		2,530
Finish Hardware		16,093		137,000		153,093
Interior Glazing-Mirrors				1,440		1,440
DOORS &						
WINDOWS		***34,098***	***27,650***	***420,970***		***482,718***
	526.424 Labor hours					
9000 FINISHES						
Metal Framing				177,120		177,120
Exterior Wall Assembly						
Drywall Ceilings						
Ceramic Tile						
Flooring Sub				61,952		61,952
Waterproofing				2,416		2,416
Acoustic Ceiling				23,000		23,000
Rubber Floors and Treads						
Polished Concrete Floor				32,708		32,708
Sealed-Hardened Concrete						
Resinous Epoxy Floor						
Carpet Tile						
Interior Painting				48,047		48,047
FINISHES				***345,243***		***345,243***
	36,192.00 Labor hours					

Description	Quantity	Labor Amount	Material Amount	Subcontract Amount	Equipment Amount	Total Amount
10000 SPECIALTIES						
Louvers				4,000		4,000
Corner Guards		867	900			1,767
Flagpoles		520	1,750			2,270
Fire Prot Device		975	3,200			4,175
Bath Accessories				6,750		6,750
Access Panels		1,300	1,875			3,175
		3,662	***7,725***	***10,750***		***22,137***
	113.783 Labor hours					
11000 EQUIPMENT						
Food Service				45,000		45,000
Residential Appliances		997	4,700			5,697
EQUIPMENT		***997***	***4,700***	***45,000***		***50,697***
	15.333 Labor hours					
12000 FURNISHINGS						
Casework				70,000		70,000
Mail Boxes		1,820	9,600			11,420
Blinds & Shades				3,500		3,500
Display Cases		1,560	5,000			6,560
Fire Poles		3,120	38,000			41,120
FURNISHINGS		***6,500***	***52,600***	***73,500***		***132,600***
	99.994 Labor hours					
14000 CONVEYING SYS						
Elevators		1,820		69,195		71,015
CONVEYING SYS		***1,820***		***69,195***		***71,015***
	28.001 Labor hours					
210000 FIRE SUPPRESSION						
Fire Suppression				84,676		84,676
FIRE SUPPRESSION				***84,676***		***84,676***
220000 PLUMBING & HVAC						
Plumbing & HVAC				727,520		727,520
				727,520		***727,520***

Description	Quantity	Labor Amount	Material Amount	Subcontract Amount	Equipment Amount	Total Amount
260000 ELECTRICAL						
Electrical				463,664		463,664
ELECTRICAL				***463,664***		***463,664***
340000 ALLOWANCES						
Winter Conditions Allowance				40,000		40,000
Permits Fee Allowance				2,000		2,000
Utility Connection Allowance				2,500		2,500
HazMat Abatement Allowance				20,000		20,000
Landscaping Allowance				15,000		15,000
Material Testing and 3rd Party Allow				22,500		22,500
Security System Allowance				40,000		40,000
Vehicle Exhaust Allowance				20,000		20,000
Signage Allowance				8,000		8,000
ALLOWANCES				***170,000***		***170,000***

Estimate Totals

Description	Amount	Totals	Hours	Rate	Cost Basis	Cost per Unit
Labor	699,320		47,326.909 hrs			39.007 / sf
Material	468,980					26.159 / sf
Subcontract	4,480,385					249.910 / sf
Equipment	68,075		96.000 hrs			3.797 / sf
Other						
	5,716,760	**5,716,760**				**318.873 / sf**
CM's Contingency	457,341			8.000 %	T	25.510 / sf
Gen'l. Liab. Ins.- Commercial	7,258			0.162 %	C	0.405 / sf
Umbrella & Professional Liab.	10,075			0.155 %	T	0.562 / sf
Fixed Price Bond	58,499			0.900 %	T	3.263 / sf
Const. Mngr. Fee	249,997			4.000 %	T	13.945 / sf
Total		***6,499,930***				***362.557 / sf***

SOFT COSTS

Soft costs are any of the expenses and fees related to the services required to design and implement a project that are not direct construction costs. These generally account for 16% to 20% of the total project cost.

EXAMPLES OF SOFT COST

- Builder's Risk Insurance
- Owner's Construction Contingency
- Moving Expenses
- Architectural/Engineering Fees
- Landscape Design Fees
- Reimbursable Expenses
- Soils & Materials Testing
- Video/Voice/Data Consultant & Equipment
- Security Systems & Consultant
- Fuel Tank Removal or Relocation
- Kitchen Equipment
- Primary Equipment
- Interior Finishes/Furniture
  - Loose Furniture
  - Window Treatments
  - Visual Display/Tack Boards
  - Audio Visual Equipment
- Extractor Gear Washer & Dryer
- Residential Laundry Equipment
- Lockers and Gear Racks
- Utility Rebate Application
- Utility Connection & Transformer
- Building Commissioning & Agent
- Computer/Data System (Computers)
- Cable Wiring, Low Voltage-CCTV
- Asbestos/ACM Testing & Abatement
- Toilet Room Accessories
- Interior & Exterior Signage
- Fire Alarm & Security Tie-in
- Telephone Systems & Wiring
- LP Gas Connection, Tank Expenses
- Custodial Equipment
- Radios & Antenna
- Display Cases & Awards Shelving

CONSTRUCTION DELIVERY METHODS

There are three conventional methods of construction delivery that are standard for this project type. Each has benefits and drawbacks which should be closely evaluated by the Project Team during the next phase. The three methods are:

Design - Bid - Build (DBB): This is the most traditional form of delivery which requires the Owner to have a contract with an Architect that provides design documents. When complete, the documents go to bid and a contractor is selected with a separate contract in place with the Owner.

Construction Manager as Constructor (CMC): Similarly to the DBB method, individual contracts are in place between the Owner/Architect and Owner/Contractor. However, in this method, the Construction Manager is brought on-board early in the process to help determine a schedule and budget, which will eventually develop into a guaranteed maximum price for the project.

Deign - Build (DB): Under the DB method, a single contract between Owner/Contractor is in place. The architect works under contract with the contractor. While this is often seen as the best way to expedite a project, the Owner loses the benefit of the Architect acting in their best interests throughout the project. It is also less transparent than the other methods.

9.01 APPENDIX

LIST OF DRAWINGS:

Existing Conditions

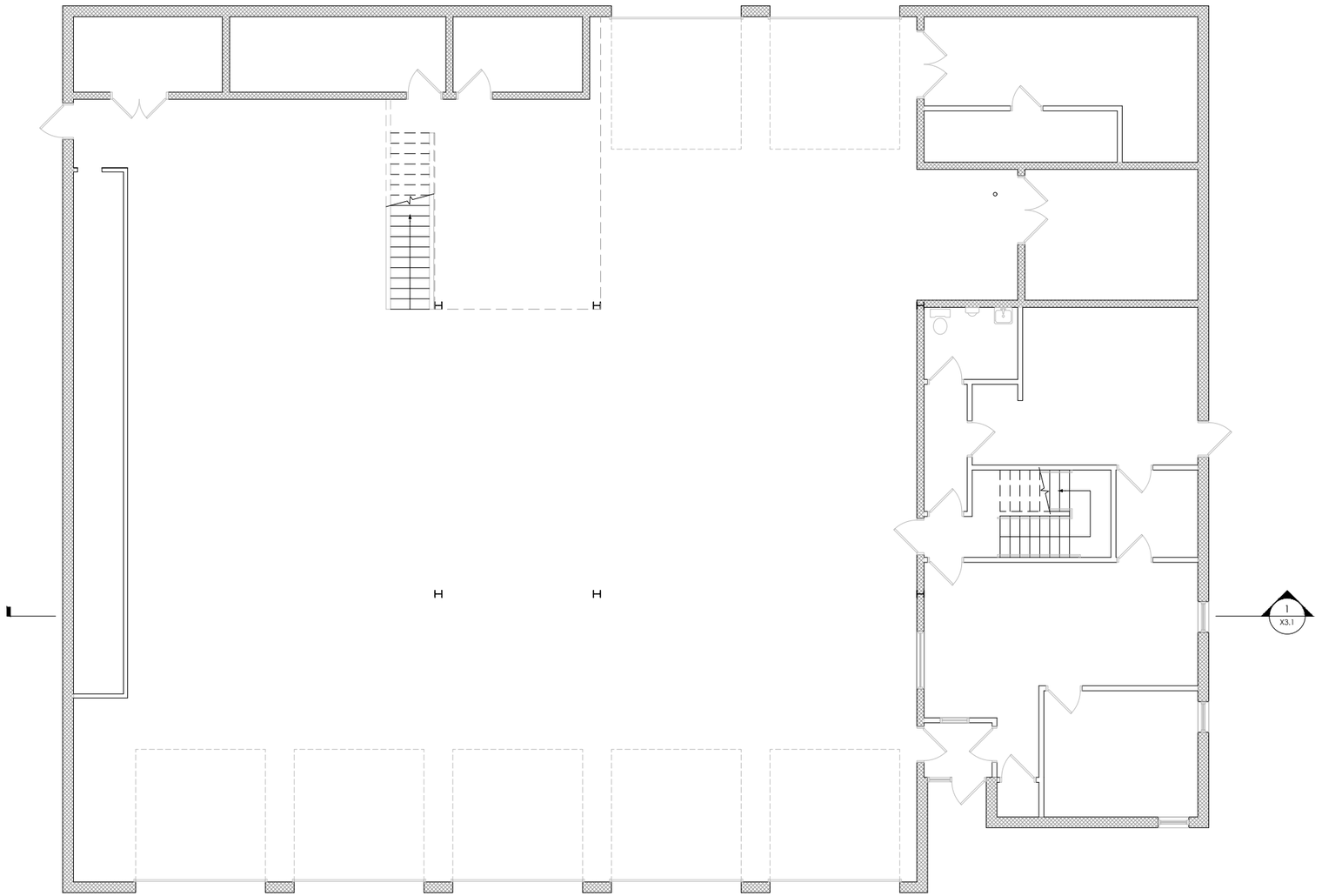
X1.1 Existing First Floor Plan
X1.2 Existing Second Floor Plan
X2.1 Existing Exterior Elevations
X3.1 Existing Building Section

Conceptual Design

A1.0 Conceptual Site Plan
A1.1 Conceptual First Floor Plan
A1.2 Conceptual Second Floor Plan
A1.3 Conceptual Third Floor Plan
A1.4 Conceptual Roof Plan
A2.1 Conceptual Exterior Elevations
A9.1 Conceptual Perspective

Site

Aerial View with Utilities (Ref. pg. 16)



1 EXISTING FIRST FLOOR PLAN
SCALE: 3/16" = 1'

PORT ONE ARCHITECTS

959 Islington Street
Portsmouth, NH 03801

603.436.8891
info@portonearchitects.com

OWNER:

STRUCTURAL ENGINEER:

MEPFP ENGINEER:

SUB-CONTRACTOR:

SUB-CONTRACTOR:

Revision History

#	Date	Issuance

ARCHITECTS STAMP

LOCUS MAP

PROJECT NAME:

SOMERSWORTH FIRE DEPARTMENT

SOMERSWORTH, NH

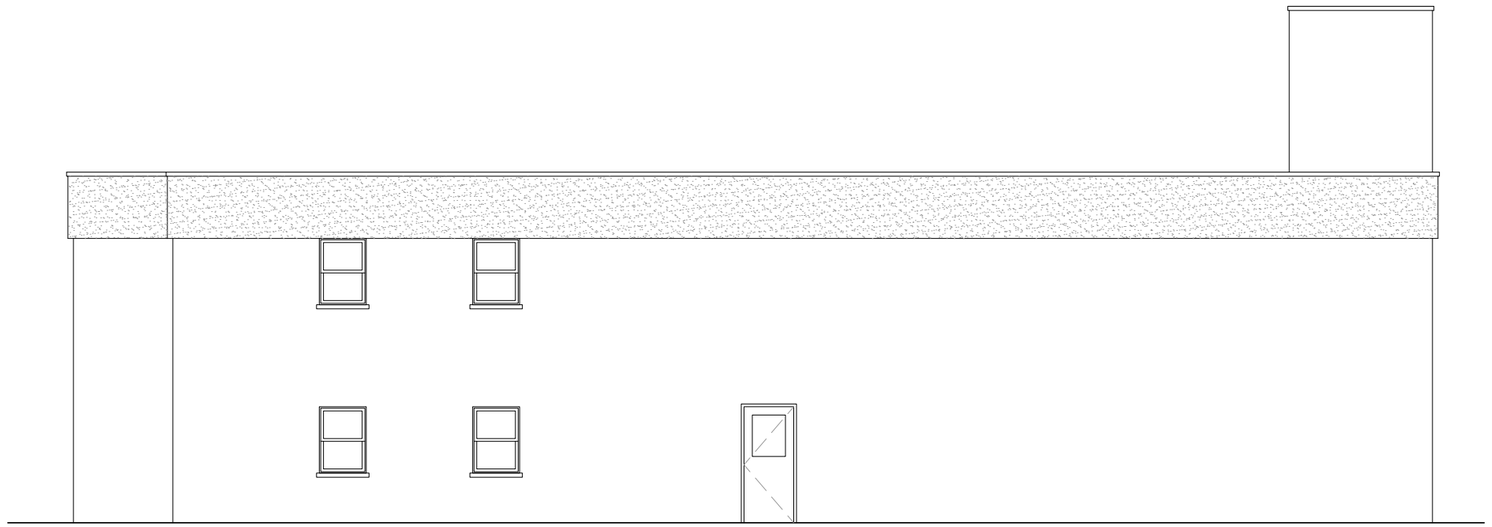
DRAWING TITLE:

EXISTING FIRST FLOOR PLAN

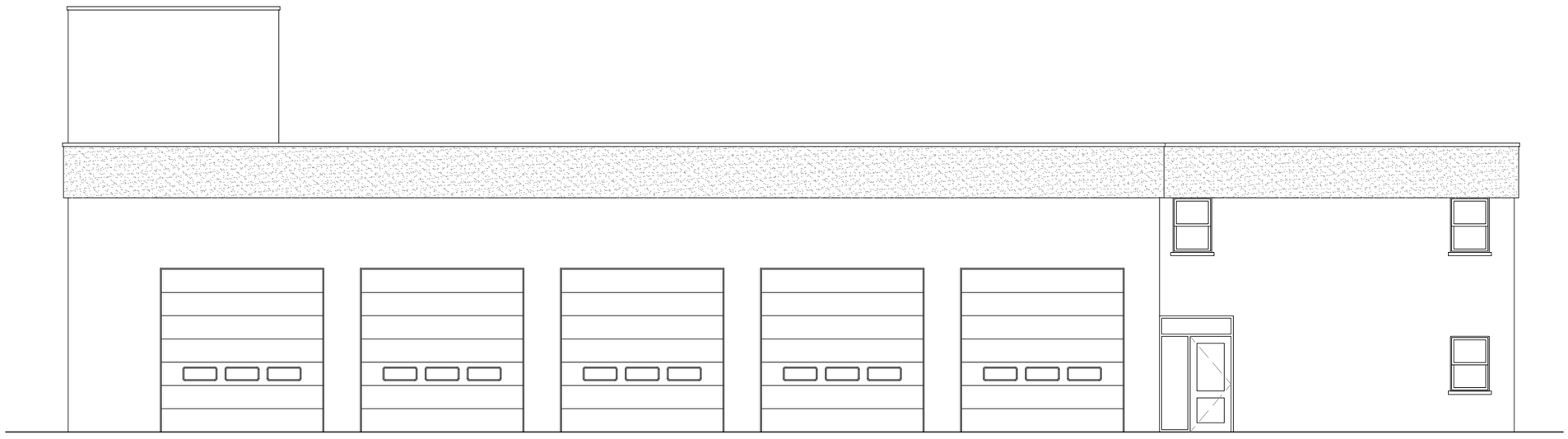
PROJECT No:	19-035
DATE:	JANUARY, 2020
DRAWING SCALE:	As indicated

DRAWING No:

X1.1



2 EXTERIOR ELEVATION
SCALE: 1/4" = 1'-0"



1 EXTERIOR ELEVATION
SCALE: 1/4" = 1'-0"

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Revision History

#	Date	Issuance

ARCHITECTS STAMP

LOCUS MAP

PROJECT NAME:

SOMERSWORTH FIRE DEPARTMENT
SOMERSWORTH, NH

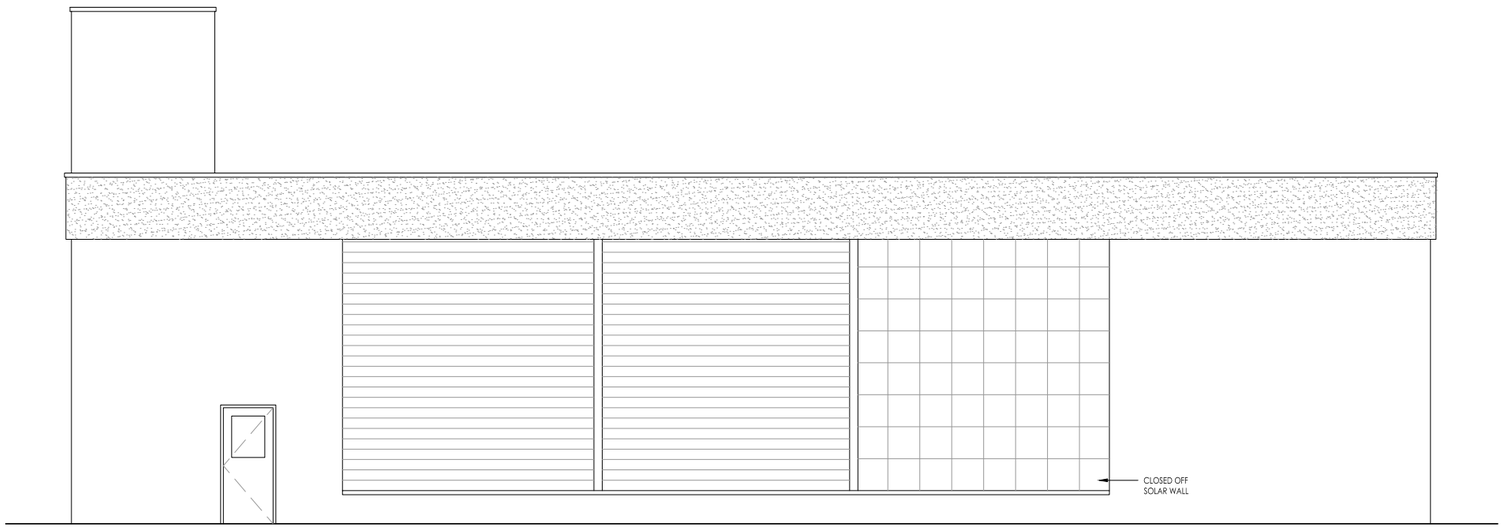
DRAWING TITLE:

EXISTING EXTERIOR ELEVATIONS

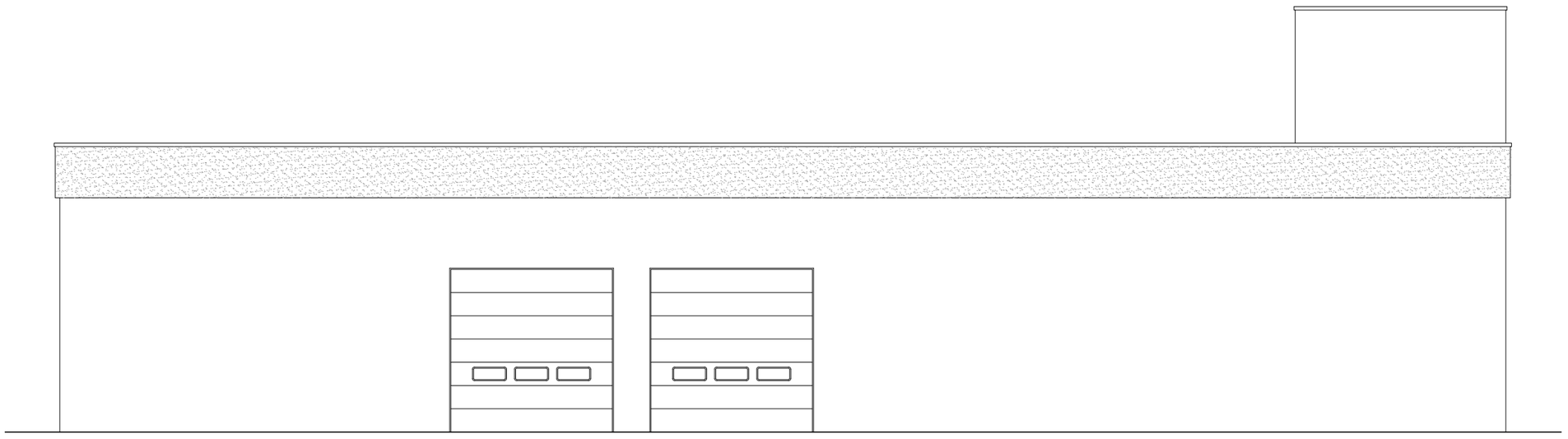
PROJECT No:	19-035
DATE:	JANUARY, 2020
DRAWING SCALE:	As indicated

DRAWING No:

X2.1



2 EXTERIOR ELEVATION
SCALE: 1/4" = 1'-0"



1 EXTERIOR ELEVATION
SCALE: 1/4" = 1'-0"

PORT ONE ARCHITECTS

959 Islington Street
Portsmouth, NH 03801

603.436.8891
info@portonearchitects.com

OWNER:

STRUCTURAL ENGINEER:

MEPFP ENGINEER:

SUB-CONTRACTOR:

SUB-CONTRACTOR:

Revision History

#	Date	Issuance

ARCHITECTS STAMP

LOCUS MAP

PROJECT NAME:

SOMERSWORTH FIRE DEPARTMENT
SOMERSWORTH, NH

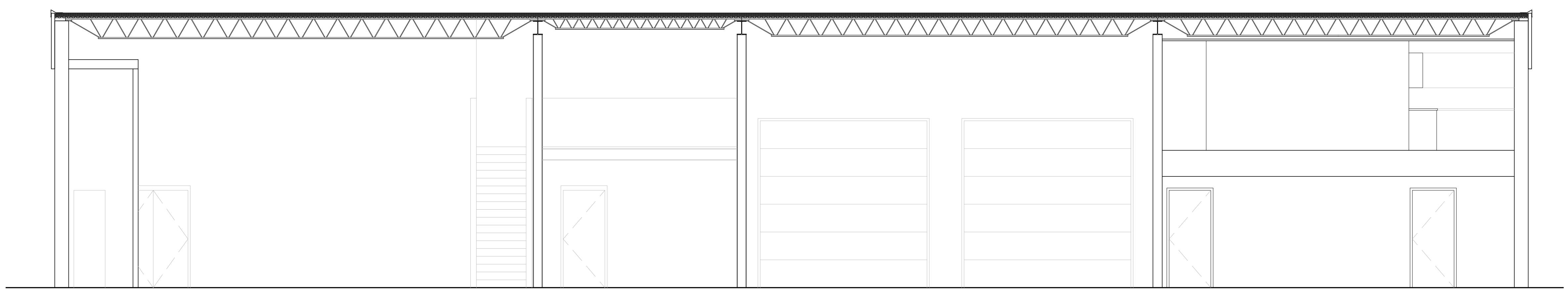
DRAWING TITLE:

EXISTING EXTERIOR ELEVATIONS

PROJECT No:	19-035
DATE:	JANUARY, 2020
DRAWING SCALE:	As indicated

DRAWING No:

X2.2



1 EXISTING BUILDING SECTION
SCALE: 1/4" = 1'-0"

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Portsmouth, NH 03801
603.436.8891
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MEPFP ENGINEER:

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SUB-CONTRACTOR:

Revision History

#	Date	Issuance

ARCHITECTS STAMP

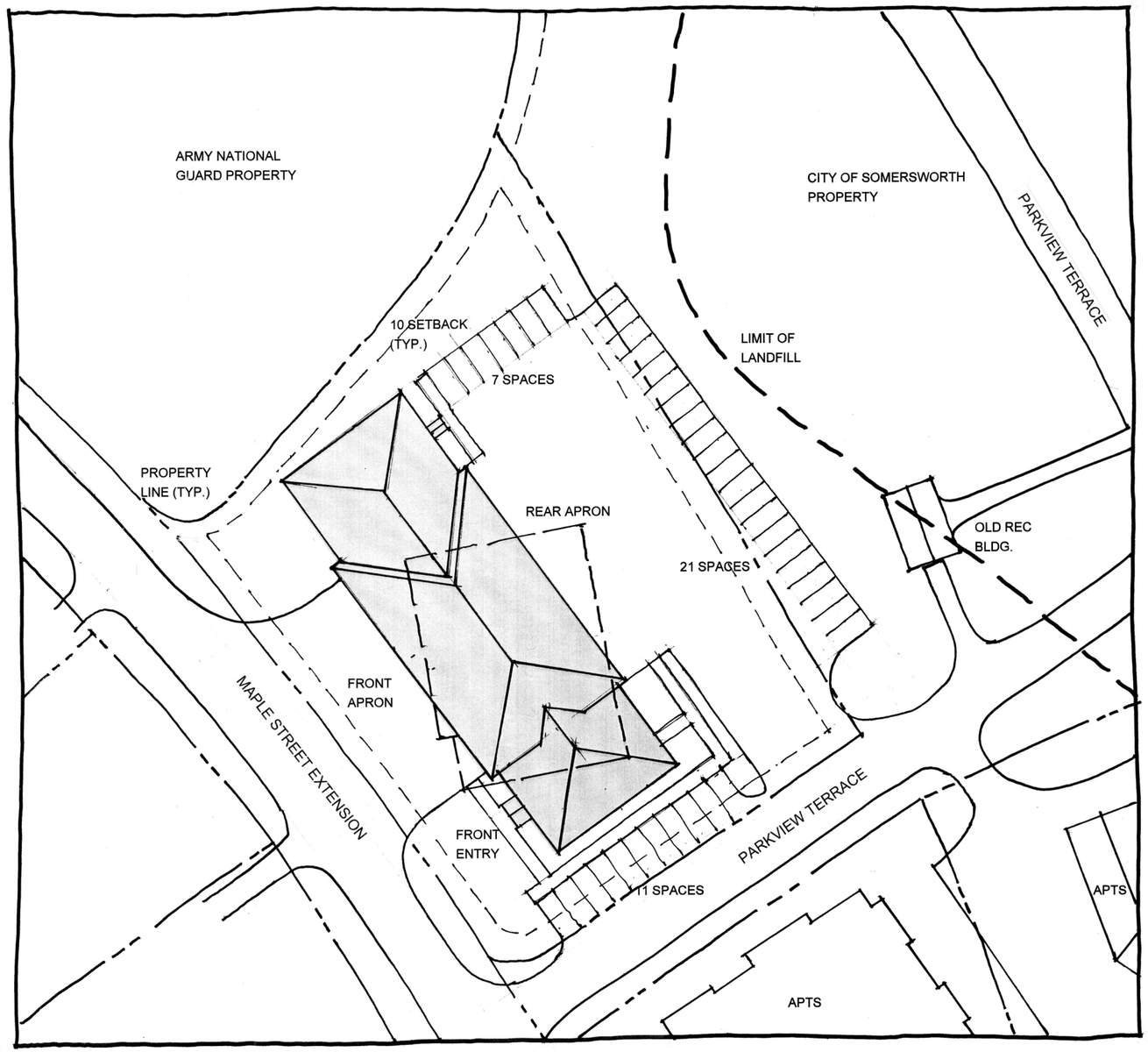
LOCUS MAP

PROJECT NAME:
SOMERSWORTH FIRE DEPARTMENT
SOMERSWORTH, NH

DRAWING TITLE:
EXISTING BUILDING SECTION

PROJECT No: 19-035
DATE: JANUARY, 2020
DRAWING SCALE: As indicated
DRAWING No:

X3.1



1 SITE PLAN
SCALE: 1" = 60'

N

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SUB-CONTRACTOR:

Revision History

#	Date	Issuance

ARCHITECTS STAMP

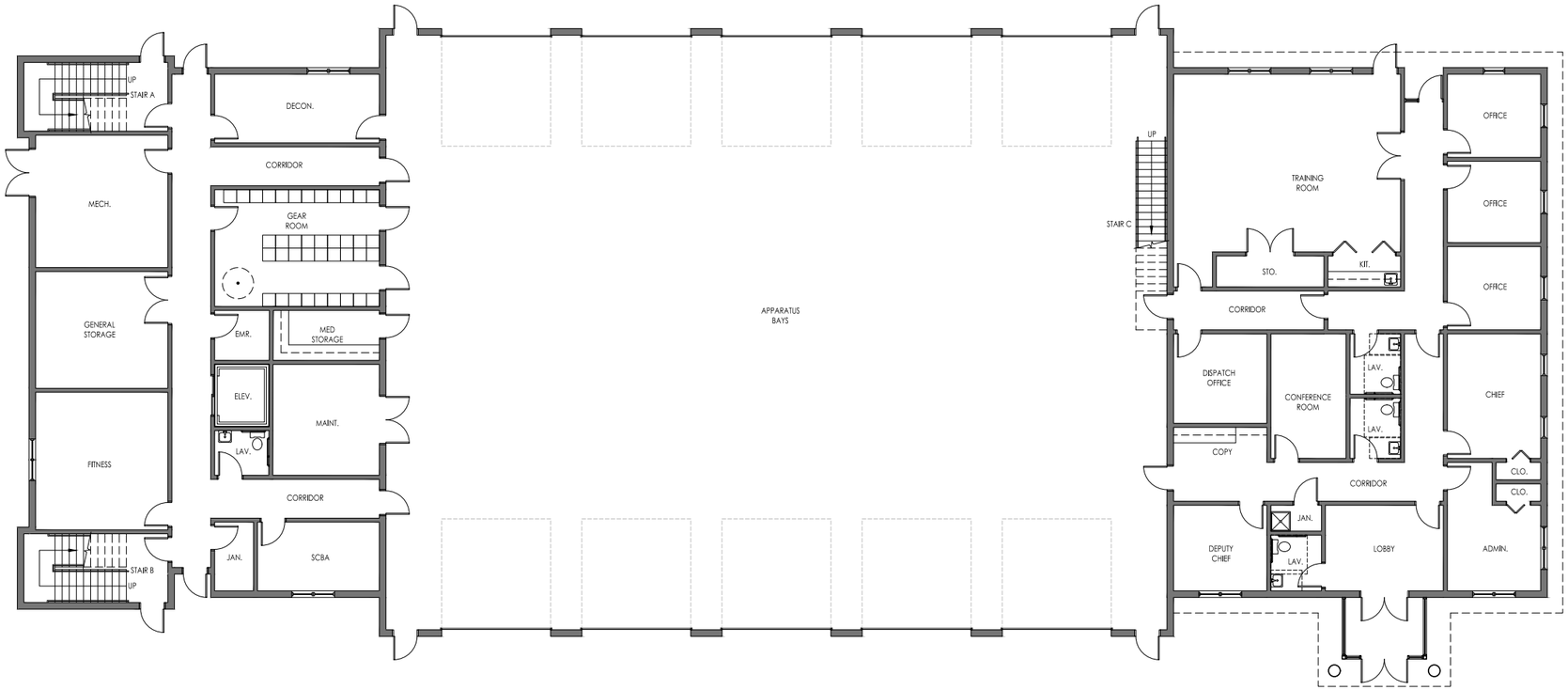
LOCUS MAP

PROJECT NAME:
SOMERSWORTH FIRE DEPARTMENT
SOMERSWORTH, NH

DRAWING TITLE:
SITE PLAN

PROJECT No:	19-035
DATE:	JANUARY, 2020
DRAWING SCALE:	As indicated

DRAWING No:
A1.0



1 FIRST FLOOR PLAN
SCALE: 1/8" = 1'

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SUB-CONTRACTOR:

Revision History

#	Date	Issuance

ARCHITECTS STAMP

LOCUS MAP

PROJECT NAME:

SOMERSWORTH FIRE DEPARTMENT

SOMERSWORTH, NH

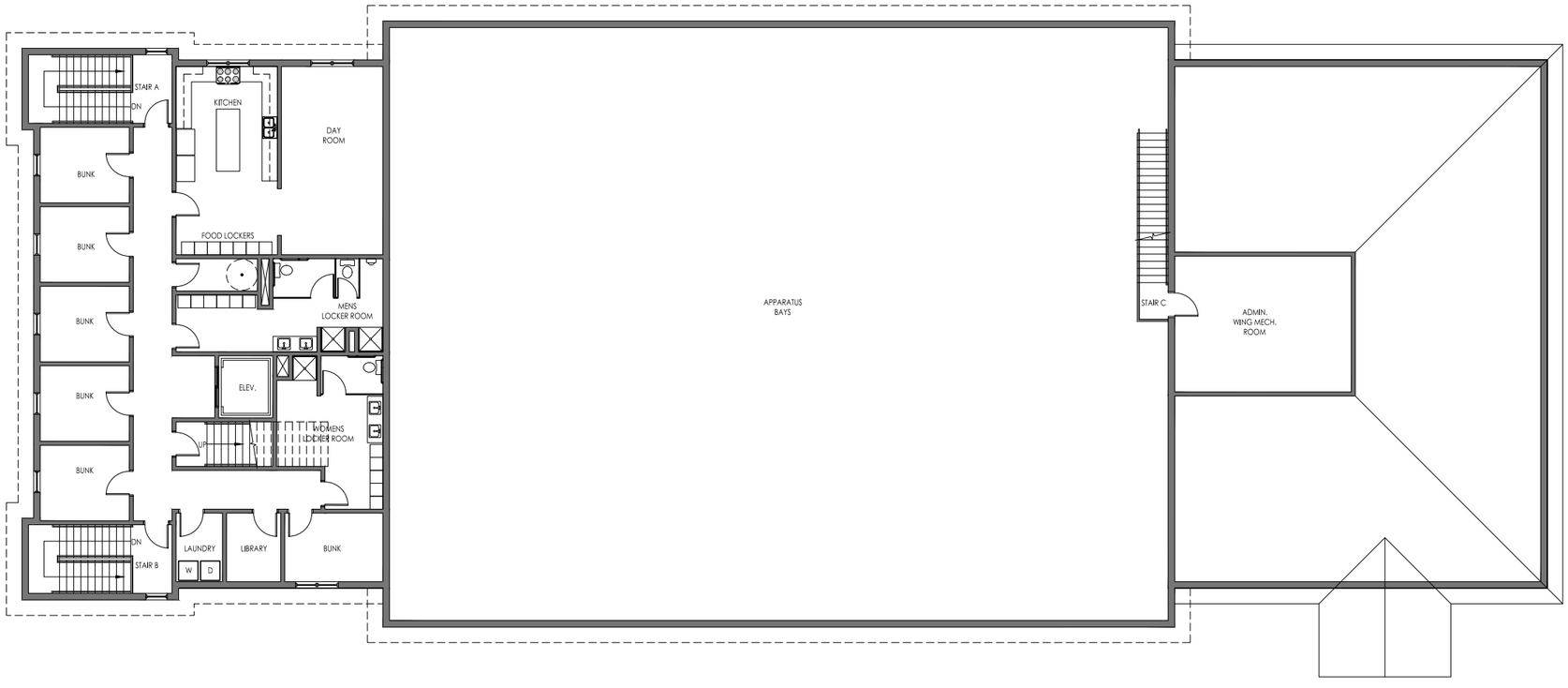
DRAWING TITLE:

CONCEPTUAL FIRST FLOOR PLAN

PROJECT No:	19-035
DATE:	JANUARY, 2020
DRAWING SCALE:	As indicated

DRAWING No:

A1.1



1 SECOND FLOOR PLAN
SCALE: 1/8" = 1'

PORT ONE ARCHITECTS

959 Islington Street
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SUB-CONTRACTOR:

Revision History

#	Date	Issuance

ARCHITECTS STAMP

LOCUS MAP

PROJECT NAME:

SOMERSWORTH FIRE DEPARTMENT

SOMERSWORTH, NH

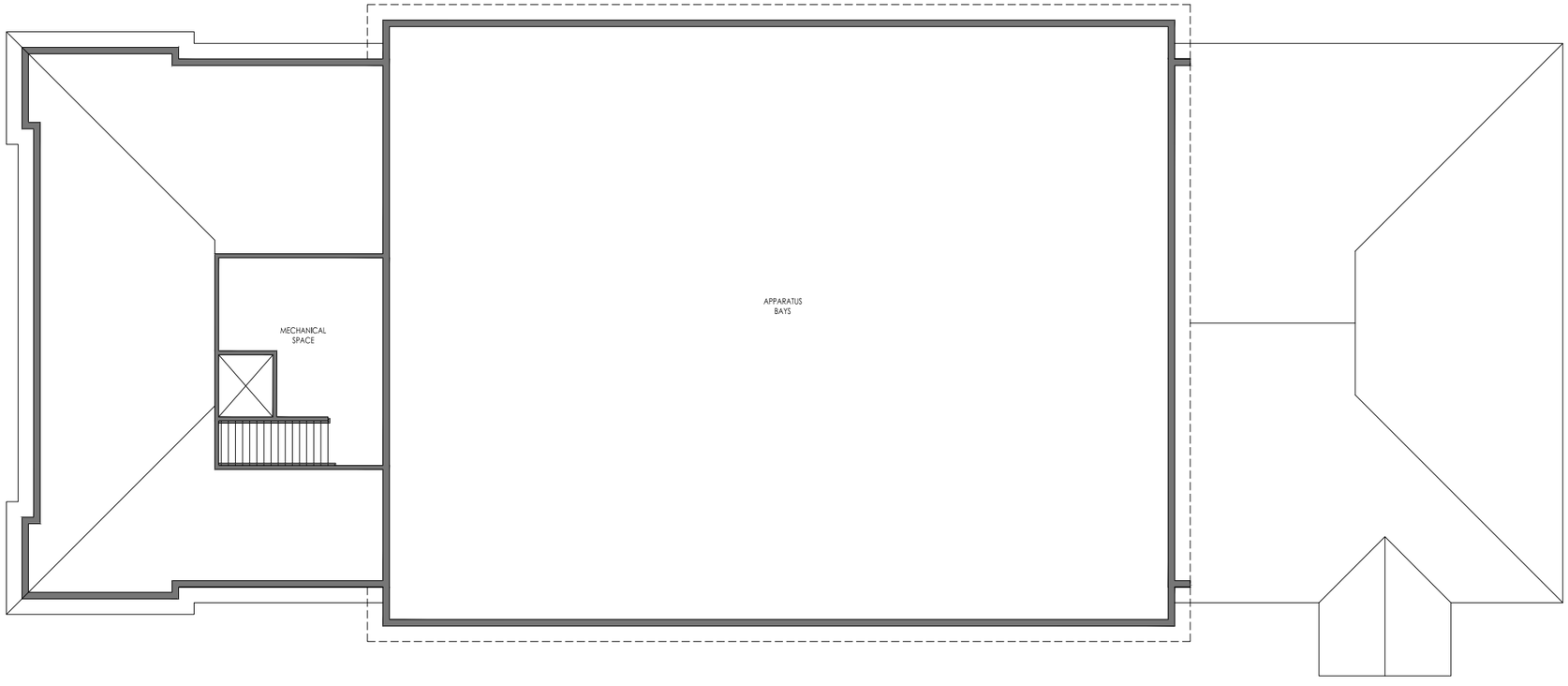
DRAWING TITLE:

CONCEPTUAL SECOND FLOOR PLAN

PROJECT No:	19-035
DATE:	JANUARY, 2020
DRAWING SCALE:	As indicated

DRAWING No:

A1.2



1 THIRD FLOOR MECHANICAL SPACE
SCALE: 1/8" = 1'

PORT ONE ARCHITECTS

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Revision History

#	Date	Issuance

ARCHITECTS STAMP

LOCUS MAP

PROJECT NAME:

SOMERSWORTH FIRE DEPARTMENT

SOMERSWORTH, NH

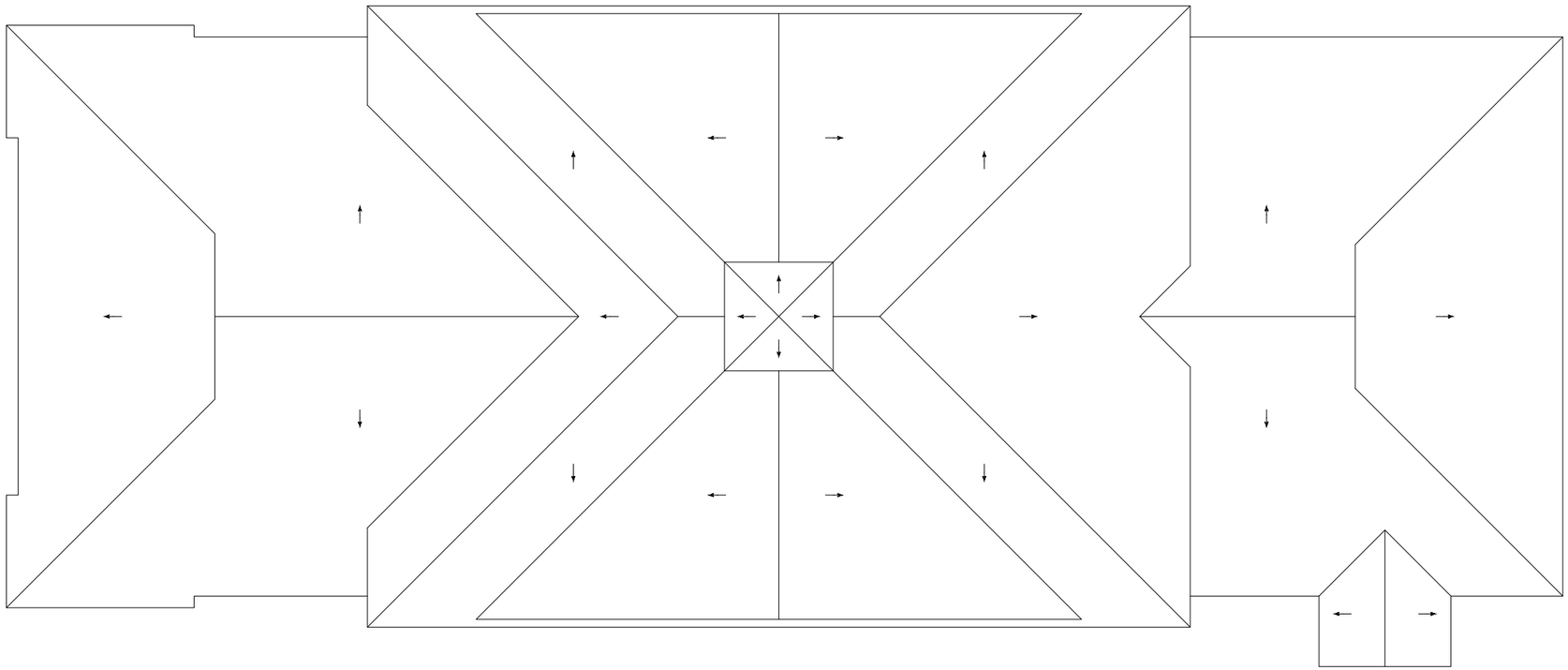
DRAWING TITLE:

CONCEPTUAL THIRD FLOOR PLAN

PROJECT No:	19-035
DATE:	JANUARY, 2020
DRAWING SCALE:	As indicated

DRAWING No:

A1.3



1 ROOF PLAN
SCALE: 1/8" = 1'

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Revision History

#	Date	Issuance

ARCHITECTS STAMP

LOCUS MAP

PROJECT NAME:

SOMERSWORTH FIRE DEPARTMENT

SOMERSWORTH, NH

DRAWING TITLE:

CONCEPTUAL ROOF PLAN

PROJECT No:	19-035
DATE:	JANUARY, 2020
DRAWING SCALE:	As indicated

DRAWING No:

A1.4

4 NORTHEAST ELEVATION
SCALE: 1/8" = 1'-0"

3 SOUTHEAST ELEVATION
SCALE: 1/8" = 1'-0"

2 NORTHWEST ELEVATION
SCALE: 1/8" = 1'-0"

1 SOUTHWEST ELEVATION
SCALE: 1/8" = 1'-0"

PORT ONE ARCHITECTS
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Portsmouth, NH 03801
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OWNER:

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SUB-CONTRACTOR:

Revision History

#	Date	Issuance

ARCHITECTS STAMP

LOCUS MAP

PROJECT NAME:

SOMERSWORTH FIRE DEPARTMENT
SOMERSWORTH, NH

DRAWING TITLE:

EXTERIOR ELEVATIONS

PROJECT No:	19-035
DATE:	JANUARY, 2020
DRAWING SCALE:	As indicated

DRAWING No:

A2.1

1 EXTERIOR PERSPECTIVE
SCALE: 1/8" = 1'-0"

PORT ONE ARCHITECTS

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Portsmouth, NH 03801

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SUB-CONTRACTOR:

Revision History		
#	Date	Issuance

ARCHITECTS STAMP

LOCUS MAP

PROJECT NAME:

SOMERSWORTH FIRE DEPARTMENT

SOMERSWORTH, NH

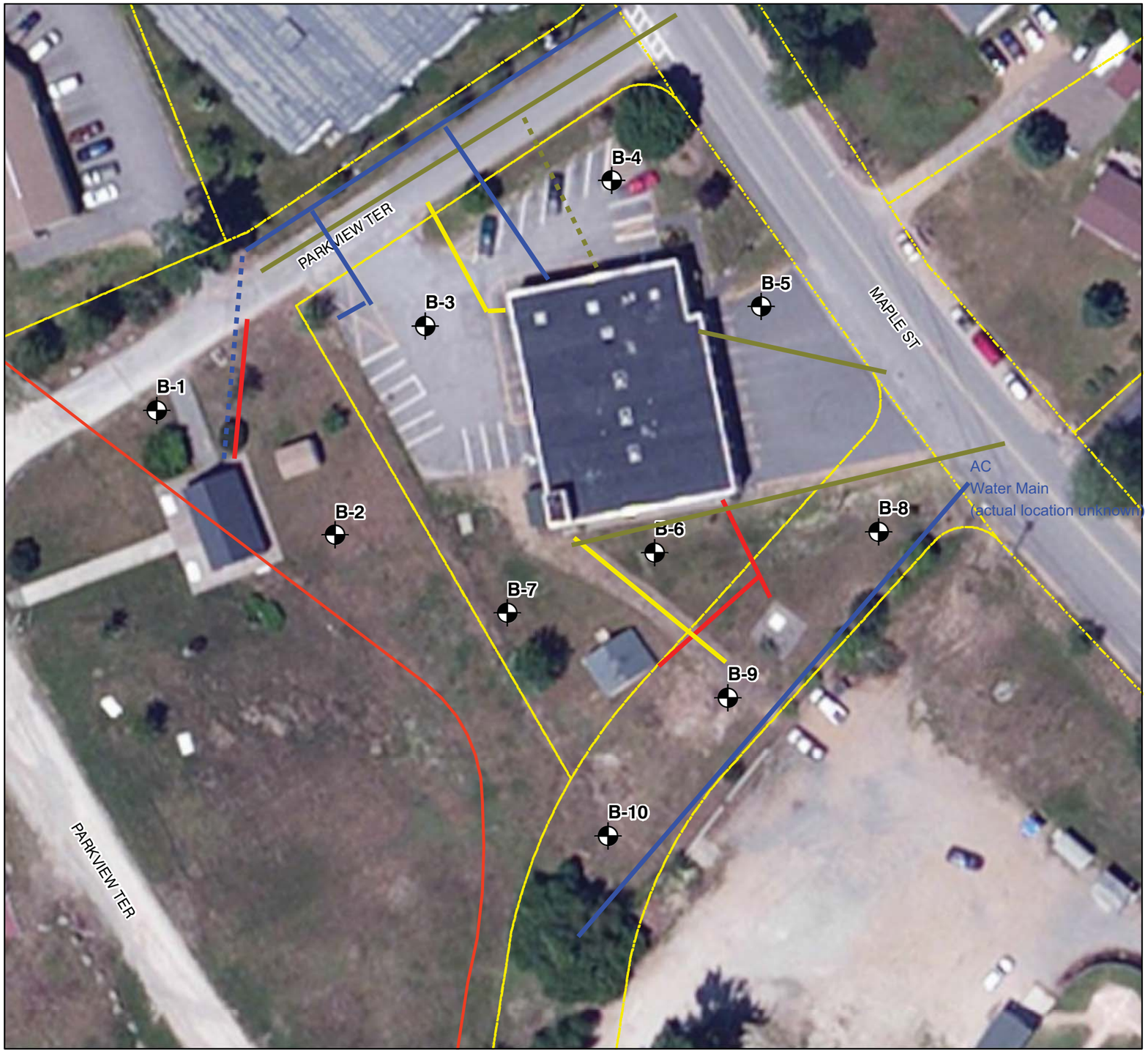
DRAWING TITLE:

EXTERIOR PERSPECTIVE

PROJECT No:	19-035
DATE:	JANUARY, 2020
DRAWING SCALE:	As indicated

DRAWING No:

A9.1



N
TRUE

LEGEND

APPROXIMATE BORING LOCATION

NOTES:

1. EXPLORATION LOCATION PLAN PREPARED FROM IMAGERY FROM ESRI ARCGIS ONLINE AND DATA PARTNERS, INCLUDING ESRI, I-CUBED, USDA, USGS, AEX, GEOEYE, GETMAPPING, AEROGRID, IGN, IGP, AND THE GIS USER COMMUNITY.

2. THE EXPLORATIONS WERE LOCATED IN THE FIELD BY S. W. COLE ENGINEERING, INC. BY TAPED MEASUREMENTS FROM EXISTING SITE FEATURES.

3. THIS PLAN SHOULD BE USED IN CONJUNCTION WITH THE ASSOCIATED S. W. COLE ENGINEERING, INC. GEOTECHNICAL REPORT.

4. 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.

50 0 50 100

Scale in Feet

S.W.COLE ENGINEERING, INC.

PORT ONE ARCHITECTURE

EXPLORATION LOCATION PLAN

PROPOSED FIRE STATION
195 MAPLE STREET
SOMERSWORTH, NEW HAMPSHIRE

Job No.	18-1709	Scale	1"=50'
Date:	09/10/2019	Sheet	1

R:\2018\18-1709\GIS\MXDs\18-1709 ELP.mxd, 9/10/2019 4:16:13 PM, 1:600.