CITY OF

PITTSBURGH

PROPERTY CONDITION REPORT

B124 – Firehouse 12 / Medic 7
4156 Winterburn Avenue
Pittsburgh, Pennsylvania 15207

June 2014

Massaro
www.massarocms.com

Table of Contents

1 Executive Summary

1.1 General Description

The City of Pittsburgh contracted with MCMS to provide a Property Condition Assessment (PCA) in order to prepare a Property Condition Report (PCR) of the subject property, located in the Greenfield neighborhood at 4156 Winterburn Avenue, Pittsburgh, PA. A walk-through survey of the subject property was conducted on July 18, 2013.

The subject property consists of a 1-story fire station with basement; containing an apparatus room, storage, break room, lockers and offices. It is unclear when the building was constructed in. The property is on a 0.2 AC municipal lot.

1.2 General Physical Condition - POOR

The general physical condition of properties is typically categorized as:

- **New** – Constructed within the last year.
- **Good** – Well constructed and maintained, without significant deficiencies.
- **Fair** – Apparent deferred maintenance issues and deficiencies that can be remedied at reasonable cost.
- **Poor** – Inadequately constructed and/or maintained, with substantial deficiencies that require significant cost and scope of work to remedy. Some items may require additional detailed analysis and testing to fully define the deficiency.
- **Derelict** – State of deficiencies and failure to maintain renders the property unfit for use and may pose direct hazard to occupants and/or the general public. For these properties, either major rehabilitation or demolition and replacement will be required.

Generally, the property appears to have been constructed within typical industry standards for the building type and period of construction. However, based on the findings of this PCA, the subject property is considered to be in **POOR** overall condition. The major deficiencies and deferred maintenance issues are as follows:

- The garage slab is failing and is an imminent safety hazard.
- The masonry enclosure is in disrepair and in need of restoration.
- The roofing system is in disrepair and will need replaced within 5 years.
- The fire detection/notification and protection systems are inadequate.

1.3 Recommendations – Table 1

See various sections of this Report for details. For the Summary of Recommendations see Table 1, Attached.

Immediate and Short Term Repairs - Table 1
Opinion of Probable Costs
Building #B124 - Firehouse 12 / Medic 7. GREENFIELD
MCMS Project No. 13-707.07

Section	Item	Quantity	Unit	Unit Cost	Cycle Replacement	Replacement %	Immediate Total	Short-Term Total
3.1	**SITE**							
a	Replace guardrail at west egress landing	1	EA	$1,000			$1,000	
b	Replace concrete paving and improve storm drainage control at parking area	3000	SF	$10				$30,000
c	Repair apparatus drive and replace trench drain (5yr)	1	EA	$10,000				$10,000
3.2	**SUBSTRUCTURE**							
3.3	**SHELL**							
b	Masonry restoration, lintel replacement, sealants	1	EA	$300,000				$300,000
c	Replace roofing system (5yrs)	4,758	SF	$28				$130,845
3.4	**INTERIORS**							
a	Remove bookcase from stair enclosure	1	EA	$0			$0	
3.5	**SERVICES**							
	Plumbing							
a	Install backflow preventer	1	EA	$3,300			$3,300	
	HVAC							
b	Boiler safety testing	1	EA	$250			$250	
c	Calibrate thermostats	1	EA	$800			$800	
	Fire Protection							
d	Add Fire Alarm devices and fire extinguishers	1	EA	$3,250				$3,250
e	GFI receptacles	3	EA	$1,800				$5,400
f	Emergency Light/sign fixtures	3	EA	$2,750				$8,250
g	CO detector in Boiler Room	1	EA	$3,500				$3,500
	Electrical							
3.6	**EQUIPMENT AND FURNISHINGS**							
3.7	**SPECIAL CONSTRUCTION**							
						TOTALS	**$5,350**	**$491,245**

2 Team, Purpose and Scope

2.1 PCA Team

Team Lead, Site, Architectural, Accessibility, Drawings:
Massaro CM Services, LLC
120 Delta Drive
Pittsburgh, PA 15238
(412) 963-2800
Alyssa Kuhns
David A. Parker AIA, NCARB

Structural:
A&A Consultants, Inc.
707 East Street
Pittsburgh, PA 15212
(412) 323-2200
Craig Bollinger, PE

Enclosure (Roof and Exterior Walls):
American Micronics, Inc.
P.O. Box 14354
Pittsburgh, Pa 15239
(412) 793-1889
Ron Paul

Mechanical, Electrical, Plumbing, Fire Protection, Energy Audit:
Cosmos Technologies, Inc.
700 River Avenue, Suite 412
Pittsburgh, PA 15212
(412) 793-1889
Mike Yanosko, CEM

2.2 PCA Purpose & Scope

Massaro Construction Management Services (MCMS) is providing Property Condition Assessment (PCA) services in general accordance with the ASTM E2018-08 *Standard Guide for Property Condition Assessments; Baseline Property Condition Assessment*. This standard is widely recognized in the real estate industry as a benchmark tool for evaluating the condition of real property. The City of Pittsburgh is undertaking a multi-year effort to complete PCA's with the following goals:

- Gain greater insight into the current scope and condition of their real property assets.
- Quantify physical deficiencies and immediate repair needs along with short and medium term capital reserve needs for preservation of those assets.
- Identify opportunities to implement Energy Efficiency Measures (ECM) to reduce energy use and hence, energy and/or demand costs.

The general scope of work in a typical PCA includes the following tasks:

- Document Review and Interviews
- Walk-Through Survey
- Opinion of Probable Costs
- Property Condition Report

2.3 Document Review and Interviews

Documents provided by the Owner include: limited architectural and mechanical drawings dated 1983, 1985, and 2003. It is unclear when this facility was originally constructed. Although formal interviews were not performed the Point of Contact (POC) Mr. Henry Cafardi, Facilities Maintenance Supervisor, was available to answer questions.

2.4 Walk-Through Survey

The scope of the walk-through survey was limited to representative visual observations of site and property improvements and should NOT be considered all-inclusive. It is conducted without protective clothing, exploratory probing, removal or relocation of materials, testing, or the use of equipment, such as ladders (except as required for roof access), stools, scaffolding, metering/testing equipment, or devices of any kind. Out-of scope issues include but are not limited to:

- Operating, measurement and/or testing of any building systems.
- Assessment of any process-related equipment or systems.
- Assessing components of systems that are not readily observable.
- Entering limited access or confined spaces.
- Accessing pitched roof areas or any roof area that appears unsafe.
- Determining applicability of Life Safety/Fire Protection code requirements.

2.5 Opinion of Probable Costs

Replacement, repairs, and routine maintenance of various building components and systems are discussed in various sections of this report and opinions of their probable costs are summarized for the evaluation period in the attached tables. Per ASTM E2018-08; costs indicated should be considered preliminary, order of magnitude budgets. Actual costs most probably will vary from those contained within depending on such matters as type and design of suggested remedy, quality of materials and installation, manufacturer and type of equipment or system selected, field conditions, whether a physical deficiency is repaired in part or replaced in whole, phasing of the work (if applicable), quality of contractor, quality of project management exercised, market conditions, and whether competitive pricing is solicited, etc. Certain opinions of probable costs can not be developed within the scope of this assessment without further study. Where applicable, the opinion of the probable costs for further study will be included.

- **Immediate Costs** are to remedy those deficiencies that require immediate action as the result of any of the following:
    - material existing or potential unsafe condition
    - material building or fire code violations
    - conditions that if left uncorrected have the potential to result in or contribute to critical element or system failure within one year or will result most probably in a significant escalation of its remedial cost.
- **Short-Term Costs** are to remedy physical deficiencies, such as deferred maintenance, that may not warrant immediate attention, but require repairs or replacements that should be undertaken on a priority basis in addition to routine preventative maintenance. Unless noted otherwise, generally the time frame for such repairs is 1-2 years. Such opinions of probable costs may include costs for testing, exploratory probing, and further analysis; or these services may be evaluated separately.

2.6 Property Condition Report (PCR)

The Property Condition Report documents the findings of the PCA. This report is for the use of this Client only, for the stated purpose above. Specific language in the descriptions of the various PCA processes, intent, scopes of work, and/or definitions throughout Section 1-2 of this PCR are excerpted directly in whole or in part from the ASTM E2018-08 Standard (herein the 'Standard') document without specific attribution. All rights remain with the ASTM. In the event of any discrepancy between statements in this Report and the Standard, the scope and intent in the respective sections of the Standard shall govern. A complete copy of the Standard may be made available upon request.

2.7 Additional Scope Considerations

For this assessment, in addition to the baseline PCA tasks, further considerations are taken into account and additional deliverables are included as follows:

- **Schematic Floor Plans** – Produced using Autodesk Revit™ Building Information Modeling (BIM) software, and including limited field check of representative dimensions and documentation of changes to layout. These drawings and associated floor area information provide a helpful quick reference tool for General Services and Architectural Division staff. They are schematic in nature and should NOT be considered complete documentation of as-built conditions. City develop a BIM Standard and/or Computer Aided Facilities Management (CAFM) program in the future, this initial modeling effort can be further enriched and aligned with those initiatives.

- **Energy Audit** – Level 1, Walk-Through Analysis, per the *Procedures for Commercial Building Energy Audits, 2nd. Ed.* Published by the American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE). This Audit provides an overview of building systems and their functional operation, benchmarks the Energy Use Index (EUI) of the subject property against comparables, identifies low/no-cost changes to current Operations and Maintenance (O&M) process to provide savings, and identifies potential capital improvements for further study.

3 Element Descriptions and Observations

3.1 Site

The building is located on a 0.2 AC municipal corner lot. Overall the Site is in Fair condition.

1. Topography and Drainage – The subject property slopes steeply from the upper level along Winterburn, pitching down to the west along Farnsworth. Generally, the grade of the site and perimeter paving pitches away from the building sufficiently to drain. See parking area drainage note below.

2. Access and Egress – On-grade access is available through the apparatus room doors. There is access to grade from both the upper and lower levels, although the man door at the upper level is no longer utilized. Vehicle access for emergency equipment is from Winterburn. Parking is available (+/- 8 spaces) at the west side / lower level with access from the alley off of Farnsworth. Guardrail was removed from landing at west egress door. This is a safety hazard.

   Recommendation: Replace guardrail at west egress landing.

3. Paving, Curbing and Parking – The site paving is concrete and is generally in Good condition at the upper level, and POOR condition at the lower parking area. Accessible parking is NOT available. Concrete curbs and walks are in Fair condition, with areas of heavy cracking, scaling, spalling and minimal settlement. The apparatus drives and parking areas are illuminated by building mounted floodlights.

   Recommendation: Replace concrete pavement/ curbs at parking area and improve storm water infrastructure to prevent onsite storm water from leaving the property.

4. Landscaping and Appurtenances – Landscaping and plantings consist primarily of grass lawn and one deciduous tree. Planting beds adjacent to the parking area and bank/terraces at the north side of the building appear to be poorly attended.

5. Site Amenities / Accessory Structures- Site flagpole is rusted but appears to be serviceable.

3.1 Site: Photos

ST1 – View from Winterburn looking SW

ST2 – Looking W along north edge of property

ST3 – Looking north along Winterburn

ST4 – Looking NE from Farnsworth

ST5 – Looking north from Farnsworth

ST6 – Broken pavement at parking area

3.2 Substructure

This visual inspection included the observation of the substructure including foundation and basement construction. Overall the Substructure is in Good condition.

1. Foundation: Constructed of concrete - Good condition: the basement walls have a few light cracks.
2. Slab on grade: The basement floor is concrete and has some light cracks.

3.3 Shell

1. Overall the Shell is in Fair condition.

2. Building Frame
   2.1. The first floor of the entire building is constructed of reinforced concrete T-Beams with four CMU added structural walls running west to east. The CMU walls are in good condition
   2.2. The concrete reinforced concrete T Beams are in good condition they have areas of light cracks ,and light spalls.
   2.3. The first floor decking is severely spalled with unbonded severely rusted rebars for an approximate 24'x24' area about 14' from the overhead doors. The top of the decking has been sounded and found to be hollow in many areas within the 24'x24' area. This inspection resulted in closure of the area to emergency vehicles.
   2.4. The concrete encased steel roof beams are in good condition, no steel is visible
   2.5. All interior stairs are in good condition

3. Building Façade
   3.1. Construction: The building walls are constructed with brick masonry. Wall penetrations include: 2 metal man doors, 2 garage doors, 30 windows, 16 glass block windows and 3 wall louvers. All doors and windows have metal frames.
   3.2. There are areas with light brick cracking, step cracking, brick bulging at lintels and areas of minimal brick displacement
   3.3. Parapets are in poor condition with brick cracking and mortar loss
   3.4. Window lintels have light/ heavy rust with areas of bulging brick, loss of mortar and minimal brick displacement
   3.5. Sidewalks have areas of heavy cracking, scaling, spalling and minimal settlement.
   3.6. Fire Station Concrete Apron has areas of joint spalling and trench drain is loose from anchors.
   3.7. Fire Fighter parking area has spalling and heavy cracks

   Recommendations:

   Immediate: Closure of Garage Floor Area, Repair the Garage Floor -$45,000
   Short-term:
   - Masonry restoration including sealant and lintel repair/replacement
   - (5yr.) Replace the front trench drain and repair apparatus drive - $10,000

4. Roof Deck
   4.1. Construction: The roof deck was not visible. There is no apparent slope to the drains.
   4.2. Condition: No conditions were observed that would indicate deck problems.

5. Roof Insulation
   5.1. Construction: No core cuts were taken.
   5.2. Condition: The insulation is assumed to be in fair condition.

6. Roof Membrane
   6.1. Construction: The roof system on the Garage bay and Firehouse areas is constructed of a built-up roof system with a slag surface. The roof system on the Co-ed addition is constructed of a Modified Bitumen membrane with a black granule surface.
   6.2. Condition: The roof membranes appeared in fair condition. It appears the roof system on the Garage Bay and Firehouse was installed overtop of an existing.

7. Membrane flashings
   7.1. Construction: The perimeter and penetration flashings are constructed with a single ply membrane on the Garage Bay and Firehouse. The flashings on the addition are the same membranes as used on the roof.
   7.2. Condition: The membrane flashing systems are in fair condition. A few repairs were observed. The wall flashing is open above the reported leak in the watchroom area.

8. Perimeter Terminations
   8.1. Construction: The building walls extend above the roof line creating a parapet wall on all roof perimeters. The parapet walls are capped with limestone coping. Existing copper counter installed under the stone coping was reused. The interior higher wall flashing is terminated with metal bar and with existing copper metal counter flashing.
   8.2. Condition: The limestone coping is in poor condition. The mortar in the bed and butt joints is cracked and missing in some areas. The metal counter flashing appears in fair condition.

9. Roof Top Penetrations
   9.1. Firehouse 12: 10 vent pipes and 2 surface mounted condensers.
   9.2. Condition: The penetrations are in fair condition.

10. Drainage System
   10.1. Construction: The Garage Bay and Firehouse areas drain into 6 interior roof drains. The Co-ed addition drains to a through wall scupper with conductor head and downspout. There is no apparent slope to the drains.
   10.2. Condition: There is some evidence of minor ponding but the drains appear to be operating properly.

11. Access: Providing an extension ladder is the only access to the roofs.

12. CONCLUSIONS

   12.1. A few leaks are reported and some have been repaired. There is one active leak in the watchroom (open flashing above).

   12.2. The building walls are in fair condition. A few defects were observed. A few cracked bricks were observed. The caulking/sealant at the doors and windows is in poor condition.

   12.3. The roof decking appears to be in fair condition. We did not observe any signs that would suggest a serious problem with the decking systems at this time.

   12.4. The roof membrane and flashing systems are in fair condition. One area of open flashing was observed above the watchroom

   12.5. The limestone coping is in poor condition. A few units are cracked. The mortar joints are cracked and open in most areas. The bed joint mortar is cracked and missing in some areas.

   12.6. The roof top units and penetrations are in fair condition.

   12.7. The drainage system is in fair condition. Any debris should be cleaned from the roof surface and continue to be cleaned twice yearly.

   12.8. With proper maintenance and corrective repairs, it is our opinion that the roofing system is in a maintainable condition for the next five years.

12.9. Estimates:

1 year: Replace caulking and sealant at doors and windows, re-point brick walls and limestone coping – this work does not have to be done at one time but as the maintenance budget permits. Inspect roofs and walls yearly and remove debris – Estimated cost: None (perform with in-house personnel)

5 year: Replace roofing and flashing system – Estimated cost: $85,644 (4,758 SF x $18/SF)

10 year: Maintain a pro-active maintenance program. Inspect the roof system and walls on a regular schedule – minimum twice a year (late spring and late fall). Estimated cost: none (perform in-house)

3.3 – Shell: Photos

SH1 – East wall, NE corner

SH2 – NE corner - Missing mortar at precast coping

SH3 – Rusted lintel - typical

SH4 – Missing sealant at window surrounds - typical

SH5 – Cracked and displaced coping above truck doors

SH6 – Middle of north wall looking east

3.3 – Shell: Photos Continued

SH7 – View from above – north is at the top

SH8 – Lower roof - looking north along west wall

SH9 – Lower roof looking at NW corner

SH10 – Lower roof – looking south along west wall

SH11 – Looking west along the north wall and over the addition

SH12 – Lower roof looking SW

3.4 Interiors

1. Interior Construction - Interior partitions are primarily brick and/or glazed tile masonry construction. Doors and frames are typically wood construction with commercial grade hardware. Overall the Interiors are in Fair condition.

2. Stairs – The concrete stairs are in Good condition.

   Recommendation: Remove bookcase from stair enclosure.

3. Interior Finishes – Much of flooring in the building is simply exposed concrete. The office/kitchen/dormitory areas have resilient tile flooring in Fair condition. The restroom flooring is ceramic tile. Ceilings are typically cement plaster throughout and are in Good condition.

3.4 Interiors: Photos

I1 – Apparatus bay

I2 – Dormitory

I3 – Locker area

I4 – Kitchen / Dining

I5 – Lower level – fitness center

I6 – Lower level – laundry / work room

3.5 Services - Plumbing

1. Fixtures
   1.1. General Description: The plumbing system is served by a combination of sanitary fixtures, supply and drain piping, and supply water meter service. Serving the locker room, men's and ladies' rooms, lunch room kitchen area, and laundry.
   1.2. Construction
      1.2.1. Four (4) toilets
      1.2.2. Nine (9) lavatory sinks
      1.2.3. One (1) urinal
      1.2.4. Four (4) shower heads
      1.2.5. Two (2) kitchen type sinks
      1.2.6. One (1) janitor's sink
   1.3. Condition Assessment
      1.3.1. Condition: **Fair**

2. Domestic Water Production
   2.1 Construction: The domestic water heating system is served by one A.O. Smith (1) 50 gallon, commercial water heater and supply piping.

Location	DWH	Type	CAP	Fuel	Pump	SSw	XTank	PRV*	CA	Control	Comments
Basement M.E.R.	1	Tank	80	NG	No	Yes	No	Yes	Yes	Unit	Installation Date: 4/10/08

Note 1: Water heater safety devices and control testing not included in project scope.
Note 2: Water heater safety devices testing should be performed by competent technician.

CA = Combustion air source: dedicated
CAP = Storage Capacity: Gallons
DWH = Domestic Water Heater
M.E.R. = Mechanical Equipment Room
NG = Natural Gas
PRV = Pressure relief valve with extension piping
SSw = Spill Switch: Draft safety
XTank = Thermal Expansion Tank

   2.1.1 Water Heater Condition: **Fair**
3. Utilities
   3.1 General Description: Potable water supply
   3.2 Construction
      3.2.1 Original meter, shut-off valve, and piping.
      3.2.2 No back-flow prevention.
   3.3 Condition Assessment: **Fair**

4. Conclusions:
   4.1 The plumbing systems are in fair to poor overall condition. Routine maintenance should continue to extend serviceability.

5. Estimates: Suggested remedies and Opinion of probable cost
   5.1 De minimus conditions
      5.1.1 Insulate supply pipes from water heaters.
   5.2 Immediate Costs
      5.2.1 Install back-flow preventer: $2,000.

3.5 Services Photos – Plumbing: Fixtures 1st Floor

P1 – Locker area lavatory sinks

P2 – Locker area lavatory piping (stainless steel)

P3 – Locker area toilets

P4 – Typical plumbing fixtures - 1

P5 – Locker area showers

P6 – Typical plumbing fixtures - 2

3.5 Services Photos – Plumbing: 1st Floor

P7 – Room shower - 1

P8 – Room lavatory sink - 1

P9 – Room lavatory sink - 2

P10 – Room toilet

P11 – Room shower - 2

P12 – Kitchen sink

3.5 Services Photos - Plumbing

P13 – Janitor/Laundry Sink

P14 – Domestic water meter and piping - 1

P15 – Domestic water meter and piping - 2

P16 – Domestic water heater - 1

P17 – Domestic water heater - 2

P18 – Domestic water heater - 3

3.5 Services - HVAC

1. HVAC System – General Description: Primary space heating for fire station is supplied by a central hot water system. It is comprised of central equipment, distribution systems, and room level terminal units. The boiler, piping, and room terminal units are reported to be original to the building. Space cooling is provided by window air-conditioning units (WACU).
   1.1. Room level terminal units: Room based heating terminals are comprised of various combinations of local window air conditioners, hot water convectors, and exhaust fans. Individual room heating units are interconnected with hot water supply and return distribution piping.
      1.1.1. Construction:

Room	RAD	BBD	FTE	WACU	SAG	RAG	EAG	EF	GRV	TStat	Notes - Comments
Toilet/ Shower	-	-	1	-	-	-	-	1	-	-	No FTE control valve(s)
Dormitory	3	-	-	1	-	-	-	-	-	-	No RAD control valve(s)
Locker Room	-	-	-	-	-	-	-	1	-	-	No RAD control valve(s)
Captains Office	2	-	-	1	-	-	-	-	-	-	No RAD control valve(s)
Kitchen	1	-	-	-	-	-	-	1	-	-	No BBD control valve(s)
Lounge	2	-	-	2	-	-	-	-	-	1	No BBD control valve(s)
Apparatus Room	6	-	-	-	-	-	-	1	-	-	(1) DCVEX, (2) SFU
EMS Room	2	-	-	1	-	-	-	-	-	-	No RAD control valve(s)
Storage #1	2	-	-	-	-	-	-	-	-	-	No RAD control valve(s)
Weight Room	2	-	-	-	-	-	-	-	-	-	No RAD control valve(s)
Unfinished	2	-	-	-	-	-	-	-	-	-	No RAD control valve(s)
Storage #2	1	-	-	-	-	-	-	-	-	-	No RAD control valve(s)

BBD = Hot Water Base Board - Copper Fin-Tube Element
DCVEX = Direct Connect Vehicle Exhaust System (Nederman)
EAG = Exhaust Air Grille
EF = Exhaust Fan
FTE = Hot water Fin-Tube-Element
GRV = Gravity Relief Ventilator
RAD = Cast Iron Hot Water Radiator
RAG = Return Air Grill
SAG = Supply Air Grill
SFU = Smoke Filtration Unit
TStat = Thermostat
WACU = Window Air Conditioning Unit

      1.1.2. Condition: Room terminal units - **Poor**
         1.1.2.1. Physical Deficiencies: No RAD Control Valves
         1.1.2.2. Functional Deficiencies: None reported or observed
         1.1.2.3. Performance Deficiencies: None reported or observed
         1.1.2.4. Maintenance observations: WACU casing corrosion
         1.1.2.5. Remaining useful life observations (RUL)
            1.1.2.5.1. WACU: 0-1 years
            1.1.2.5.2. Heating, Cooling, Ventilation: 5+ years
            1.1.2.5.3. DCVEX: 10+ years

   1.2. Heating Distribution System: The hot water heating distribution system includes black steel hot water supply and return piping and one (1) in-line centrifugal hot water pump.
      1.2.1. Construction
         1.2.1.1. Hot water piping: Black steel
         1.2.1.2. Piping Insulation: None Observed

1.2.1.3. One (1) Pumps: Factional HP, in-line centrifugal
1.2.1.4. Pump controls: Partially de-commissioned

1.2.2. Condition: Heating distribution system - **Poor**

1.2.2.1. Physical Deficiencies:	No piping insulation
1.2.2.2. Functional Deficiencies:	None reported or observed
1.2.2.3. Performance Deficiencies:	None reported or observed
1.2.2.4. Maintenance observations:	None reported or observed
1.2.2.5. Remaining useful life observations (RUL)	
1.2.2.5.1. Pump:	3-5 years

1.3. Central Boiler System:

1.3.1. Construction: The hot water system consists of one (1) Hot water boiler, one (1) circulation pump, black steel circulation piping, expansion tank, black steel fuel piping, boiler mounted safety devices, and vent pipe, and temperature controls. The boiler is fuelled by natural gas and is natural combustion type. The boiler, circulating pump, control system are functioning beyond their expected useful life (EUL), and are located in the basement mechanical equipment room (MER). The boiler inspection is certificate was not found and inspection date is unknown.

1.3.2. The hot water heating control system consists of original, partially decommissioned field mounted devices. Boiler manufacturer and BTU capacity information not available.

Location	Boiler	Type	Fuel	Comb	Pump(s)	Type	XTank	CA	Control	Comments
Basement M.E.R.	1	HW	NG	ND	1	ILC	1	Yes	Decom.	No boiler inspection certificate

Note 1: Boiler safety devices and control testing not included in project scope.
Note 2: Boiler inspection should be performed by competent official as required by L&I.
Note 3: Boiler safety devices testing should be performed by competent technician, twice during heating season.

CA = Combustion Air supply duct
Comb = Combustion Type
Decom. = De-Commissioned, Partial
HW = Hot Water
ILC = In-Line Centrifugal Pump
M.E.R. = Mechanical Equipment Room
ND = Natural Draft
NG = Natural Gas
XTank = Thermal Expansion Tank

1.3.3. Condition: Central Boiler - **Poor**

1.3.3.1. Safety Concerns:	None reported or observed
1.3.3.2. Physical Deficiencies:	None reported or observed
1.3.3.3. Functional Deficiencies:	None reported or observed
1.3.3.4. Performance Deficiencies:	OA reset
1.3.3.5. Maintenance observations:	Boiler age general condition
1.3.3.6. Remaining useful life observations (RUL):	1-2 years

1.4. Controls

1.4.1. Construction: The central and room level control systems are reported to be original to the building. The controls are observed to be in a partially de-commissioned state. The boiler and hot water pump controls appear to employ outside air temperature input.

1.4.2. Condition: Controls - **Poor**

1.5. Performance Observations

1.5.1. Energy and Sustainability: The heating system is consuming excess natural gas due to lack of fully functioning controls for the hot water heating system, old low efficiency boiler, uncalibrated thermostats, lack of local control from se-lf-contained radiator thermostatic valves, and lack of set-back controllers. The resulting excess in energy consumption is estimated at 15% of the related utility bills.

2. Utilities
   2.1. General Description: Natural gas.
   2.2. Construction
      2.2.1. Low pressure natural gas meter and associated threaded, black steel piping.
   2.3. Condition Assessment: **Fair**

3. Conclusion:
   3.1. The HVAC system as a whole is in poor condition.

4. Estimates: Suggested remedies and opinions of probable Cost
   4.1. De minimus conditions
      4.1.1. Boiler Safety Testing: $250
      4.1.2. De-lamp lighting fixtures to new ASHRAE/IES standard.
   4.2. Immediate Costs
      4.2.1. Replace old uncalibrated thermostat with programmable, wireless device: $800
   4.3. Short-Term Costs
      4.3.1. Replace Five (5) existing manual lighting switches with motion based detectors (occupancy): $2,000
      4.3.2. MER Insulation (Armaflex type): $2,000
      4.3.3. Install Three (3) LED type emergency lights: $1,200
      4.3.4. Install Three (3) Motion based occupancy detectors for Window Air Conditioning Unit control (WACU): $1,600
      4.3.5. Install OA reset controller (Tekmar 246 - BacNet): $3,500
      4.3.6. Install vent damper for boiler systems, HWS and HWR sensors: $3,600
      4.3.7. Install new wireless, WEB based Energy Management Controller/Gateway/WEB server: $4,000
      4.3.8. Replace existing boiler with high efficiency model (Triad 600SH): $26,000

3.5 Services Photos - HVAC: Roof and perimeter

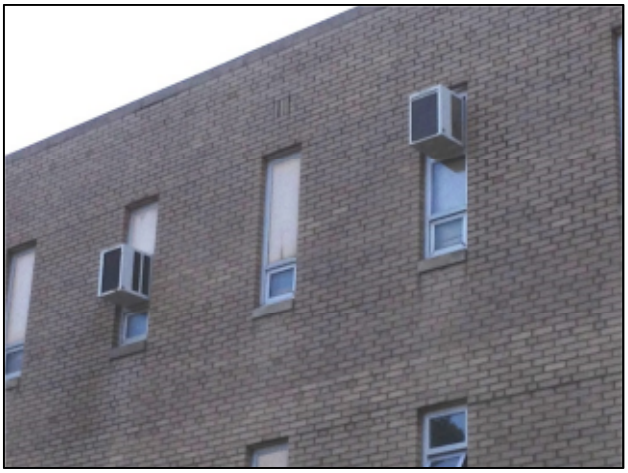
HVAC 1– DCVEX Fan

HVAC 2 – Apparatus room exhaust louver

HVAC 3 – Abandoned in-place ACCU

HVAC 4 – Exhaust vent caps

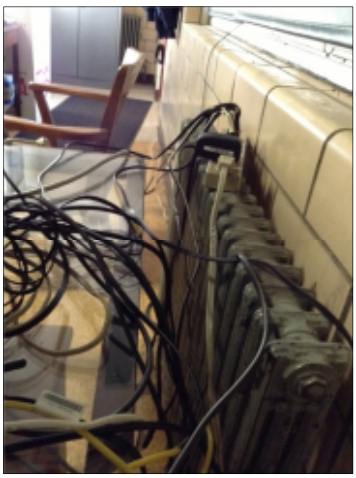
HVAC 5 – WACU -1



HVAC 6 – WACU - 2

3.5 Services Photos – HVAC: 1st Floor

HVAC 7 – Lounge WACU's



HVAC 8 – Lounge hot water radiator

HVAC 9 – Hot water radiator - 1

HVAC 10 – Hot water radiator - 2

HVAC 11 – Exhaust vent

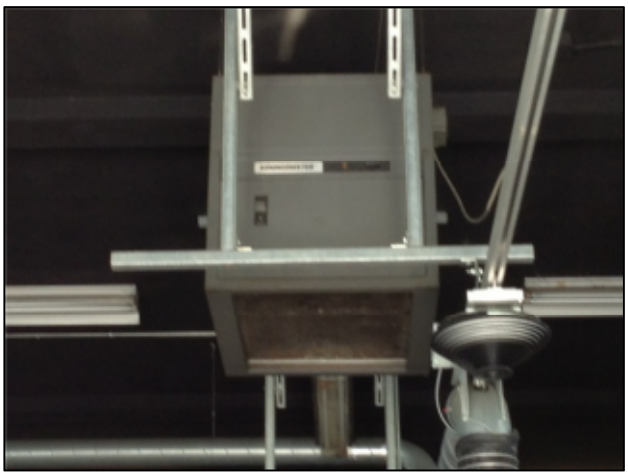
HVAC 12 – Thermostat

3.5 Services Photos – HVAC: 1st Floor

HVAC 13 – Hot water radiator - 3

HVAC 14 – WACU -2

HVAC 15 – Hot water radiator - 4



HVAC 16 – Smoke control unit (SCU)

HVAC 17 – WACU -3

HVAC 18 – WACU -4

3.5 Services Photos – HVAC: Basement

HVAC 19 – Hot water radiator - 5

HVAC 20 – Hot water piping - 2

HVAC 21 – Hot water piping & Hot water radiator -1

HVAC 22 – Hot water radiator - 6

HVAC 23 – Hot water piping & Hot water radiator -2

HVAC 24 – Hot water piping - 3

3.5 Services Photos – HVAC: Boiler, Utilities, and Misc.

HVAC 25 – Hot water heating boiler - 1

HVAC 26 – Combustion Air

HVAC 27 – Hot water heating boiler - 2

HVAC 28 – Hot water heating boiler - 3

HVAC 29 – Hot water heating pump

HVAC 30 – Gas meter

3.5 Services - Fire Protection and Life Safety

1. Flammable Gas Storage
   1.1. Liquid Propane (LP) gas tank is stored in the apparatus room/Vehicle garage with commercial BBQ grill. **Code Violation.**

2. Fire Extinguishers
   2.1. Construction: Two (2) fire extinguishers present, one on each floor.
   2.2. Condition: **Poor**

3. Alarm Systems
   3.1. No observable fire or smoke alarm system present. **Potential Code Violation.**
   3.2. No observable fire or smoke detectors present. **Potential Code Violation.**

4. Smoke Evacuation System and Stairwell Pressurization
   4.1. No Smoke Evacuation System or Stairwell Pressurization.

5. Sprinklers and Standpipes
   5.1. No sprinkler system present.

6. Emergency Lighting
   6.1. Construction: Two (2) emergency light fixtures present.
   6.2. Condition: **Fair**

7. Ground Fault Interruption
   7.1. Construction: GFI's are present in kitchen and laundry (not all receptacles)
   7.2. Condition: **Poor**

8. Conclusions:
   8.1. The building fire protection and life safety systems are physically deficient.

9. Estimates: Suggested remedies and Opinions of probable cost
   9.1. De minimus conditions
      9.1.1. Remove liquid propane (LP) gas tank for BBQ grill.
   9.2. Short-Term Costs
      9.2.1. Add a minimum of six (6) fire extinguishers
         9.2.1.1. Men's dormitory: $250
         9.2.1.2. Locker room: $250
         9.2.1.3. Apparatus room: $250
         9.2.1.4. Lunch room: $250
         9.2.1.5. Basement landing: $250
         9.2.1.6. Outside boiler room: $250
      9.2.2. Add a minimum of six (6) smoke-fire detector/alarms:
         9.2.2.1. Men's dormitory: $350
         9.2.2.2. Locker room: $350
         9.2.2.3. Lunch room: $350
         9.2.2.4. Basement landing: $350
         9.2.2.5. Outside boiler room: $350
      9.2.3. Add a minimum of three (3) GFI receptacles: $1,800
      9.2.4. Add a minimum of three (3) emergency light/sing fixtures – LED type: $1,400
      9.2.5. Add Carbon Monoxide Detector-Alarm in Boiler Room: $3,500

3.5 Services – Fire Protection and Life Safety

FP1 – EMT room

FP2 – Kitchen

LS1 – Emergency Lighting fixture/Sign

LS2 – Emergency Lighting fixture

3.5 Services - Electrical

1. Interior Lighting
   1.1. General Description: interior lighting is provided to the building by a combination of windows, and recessed mount and surface mount florescent fixtures.
   1.2. Construction

	Lighting Fixtures			Lamps				
Room	Q1	Mount	Length	Type	W1	Q2	Type	W2	Comments
Toilet/Shower (a)	3	Surface	4'	Fluor.	32	2	T8	-	Man Sw, Mag Bal, 8'AFF, NL
Toilet/Shower (b)	3	Surface	4'	Fluor.	32	1	T8	230	Man Sw, Mag Bal, 8'AFF
Dormitory	1	Recess	4'	Fluor.	32	3	T8	77	Man Sw, Mag Bal, 8'AFF, NL
Locker Room	2	Surface	4'	Fluor.	32	2	T8	102	Man Sw, Mag Bal, 8'AFF, NL
Captains Office	1	Surface	4'	Fluor.	32	2	T8	51	Man Sw, Mag Bal, 8'AFF
Bathroom	1	Recess	4'	Fluor.	32	2	T8	51	Man Sw, Mag Bal, 8'AFF
Closet	1	Recess	na	Incand.	60	1	na	60	Man Sw, 8'AFF
Kitchen	1	Surface	4'	Fluor.	32	2	T8	51	Man Sw, Mag Bal, 8'AFF
Lounge (a)	3	Surface	4'	Fluor.	32	2	T8	-	Man Sw, Mag Bal, 8'AFF, NL
Lounge (b)	1	Surface	4'	Fluor.	32	1	T8	-	Man Sw, Mag Bal, 8'AFF
Lounge (c)	2	Surface	na	Incand.	60	1	na	275	Man Sw, 8'AFF
Bathroom (a)	1	Surface	4'	Fluor.	32	2	T8	-	Man Sw, Mag Bal, 8'AFF
Bathroom (b)	1	Recess	na	Incand.	60	1	na	99	Man Sw, 8'AFF
Room 1	2	Surface	4'	Fluor.	32	2	T8	102	Man Sw, Mag Bal, 8'AFF, NL
Apparatus Room (a)	10	Surface	8'	Fluor.	80	2	T8	-	Man Sw, Mag Bal, NL
Apparatus Room (b)	3	Surface	8'	Fluor.	80	1	T8	1,472	Man Sw, Mag Bal
EMS Room (a)	2	Surface	4'	Fluor.	32	1	T8		Man Sw, Mag Bal, 8'AFF
EMS Room (b)	1	Surface	4'	Fluor.	32	1	T8		Man Sw, Mag Bal, 8'AFF
EMS Room (c)	1	Recess	na	Incand.	60	1	na	125	Man Sw, Mag Bal
Storage #1 (a)	2	Surface	4'	Fluor.	32	2	T8	-	Man Sw, Mag Bal, 8'AFF, NL
Storage #1 (b)	2	Surface	na	Incand.	60	1	na	198	Man Sw, 8'AFF
Weight Room	5	Surface	4'	Fluor.	32	2	T8	256	Man Sw, Mag Bal, 8'AFF
Room 1B	1	Surface	na	Incand.	60	1	na	48	Man Sw, 8'AFF
Room 2B	1	Surface	4'	Fluor.	32	2	T8	51	Man Sw, Mag Bal
Hall A	1	Surface	8'	Fluor.	80	1	T8	64	Man Sw, Mag Bal
Unfinished Room	1	Surface	na	Incand.	60	1	na	60	Man Sw, 8'AFF
Room 3B	2	Surface	4'	Fluor.	32	2	T8	102	Man Sw, Mag Bal, 8'AFF
Stairwell	2	Surface	4'	Fluor.	32	2	T8	102	Man Sw, Mag Bal, 8'AFF, NL
Stairway Landing	1	Surface	4'	Fluor.	32	2	T8	51	Man Sw, Mag Bal
Storage #2	2	Surface	4'	Fluor.	32	2	T8	102	Man Sw, Mag Bal, 8'AFF, NL
Hallway	1	Surface	8'	Fluor.	80	2	T8	128	Man Sw, Mag Bal, 8'AFF
Mechanical Room	2	Surface	na	Incand.	60	1	na	120	Man Sw, 8'AFF

Note #1: Three (3) total lamps out
AFF = Mounting Height Above Finished Floor
Flour = Fluorescent
Incand. = Incandescent
Length = Standard Fixture Length
Mag Bal = Magnetic Ballast
Man Sw = Manual Wall Switch
NL = Natural Lighting
Q1 = Fixture Quantity
Q2 = Lamp Quantity per Fixture
W1 = Watts per Lamp
W2 = Watts/room (Net: 0.80 BF applied)

   1.3. Condition Assessment: Interior
      1.3.1. Condition: **Fair**

2. Power Distribution
   2.1. Construction and condition
      2.1.1. Distribution panels (original to building): Condition-**Fair**
      2.1.2. General Receptacles (original to building): Condition-**Fair**

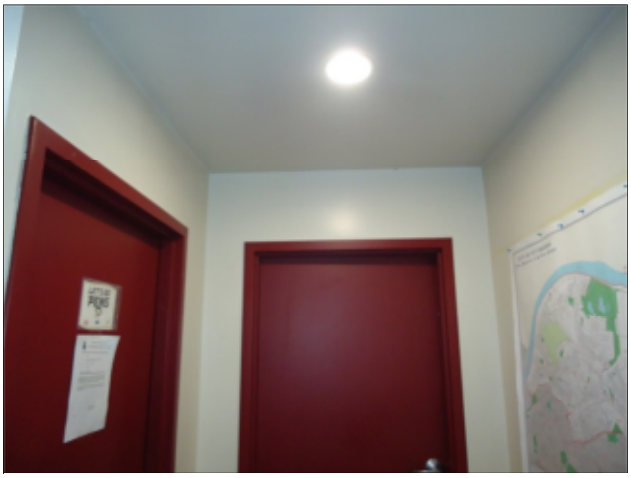
3. Utilities Service
   3.1. Construction
      3.1.1. One (1) 3-phase original electric service.
   3.2. Condition Assessment
      3.2.1. Condition Power Service: **Fair**
      3.2.2. Condition Electric Meter: **Good**

4. Conclusions:
   4.1. The interior electrical system as a whole is in fair condition.

5. Estimates: Suggested remedies and Opinion of probable cost
   5.1. Immediate Costs
      5.1.1. See GFI in Life Safety section.

3.5 Services Photos – Interior Lighting: 1st Floor

E1 – Locker room



E2 – Hallway

E3 – Kitchen

E4 – Apparatus room - 1

E5 – Apparatus room - 2

E6 – Apparatus room - 3

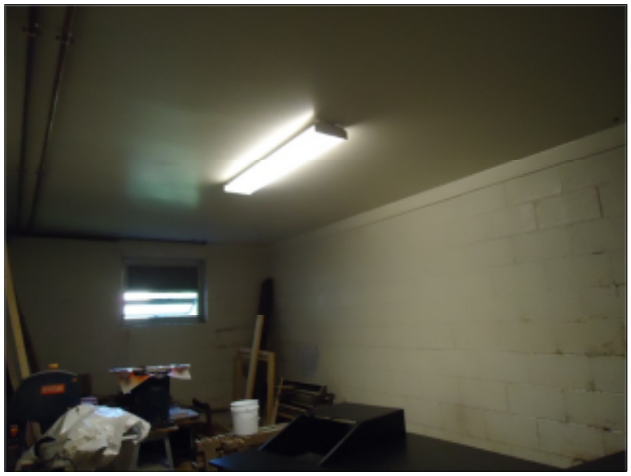
3.5 Services Photos –Interior Lighting: Basement

E7 – Locker area -1

E8 – Locker area - 2

E9 – Work area

E10 – Locker area - 3



E11 – Surface mount fixture (typical)

E12 – Weight room

3.5 Services Photos – Electrical: Service, Distribution, and Receptacles

E13 –Electric meter

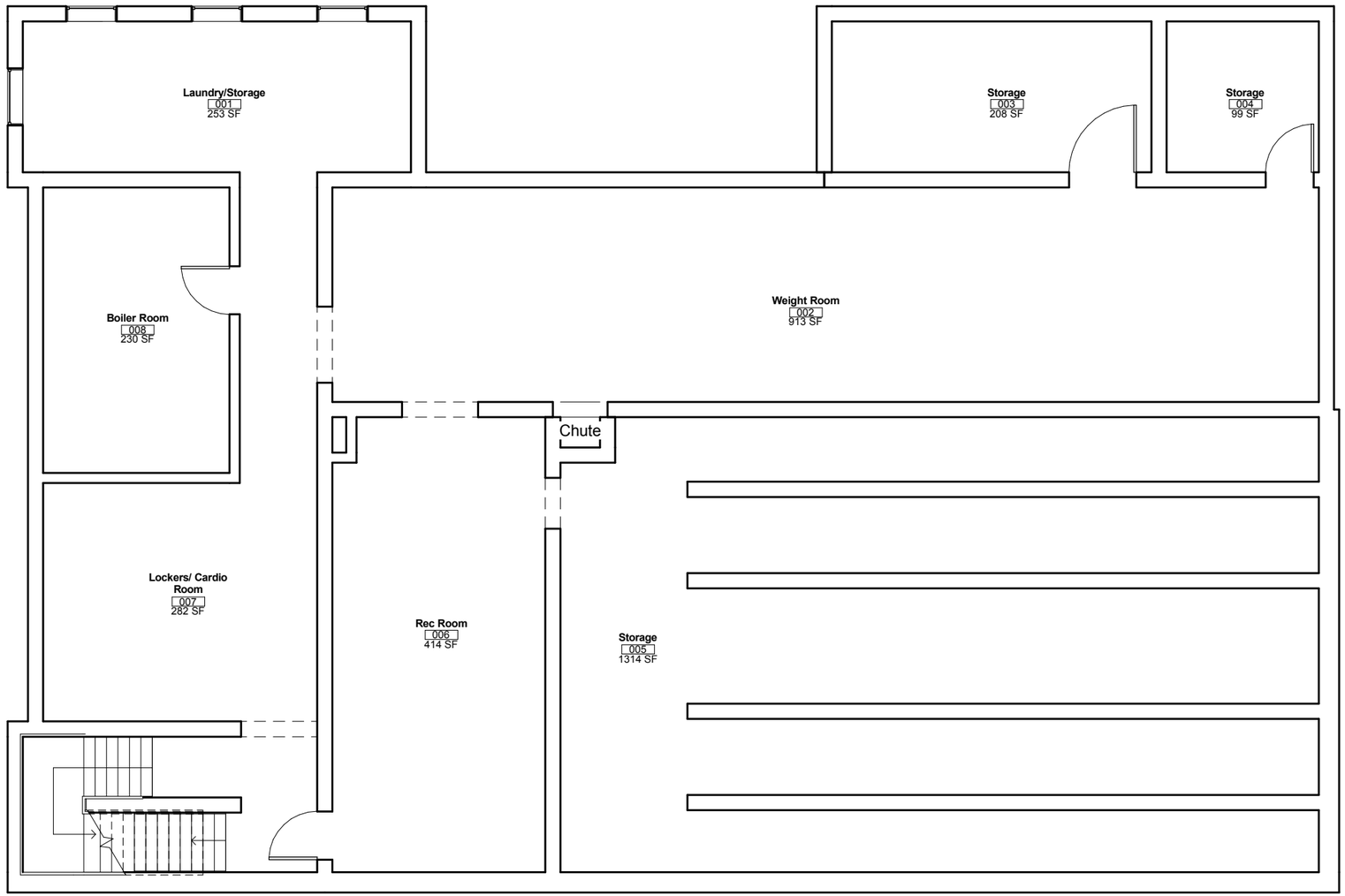
E14 – Electric service

E15 – Breaker panel 1st Floor

E16 – Breaker panel Basement

E17 – Kitchen 4-way receptacle

E18 – WACU receptacle



1 Basement
1/8" = 1'-0"

The drawings and related digital files are a schematic rendition of the existing conditions of the facility only. Please verify exact field conditions before using these for further construction and renovation work.

Massaro

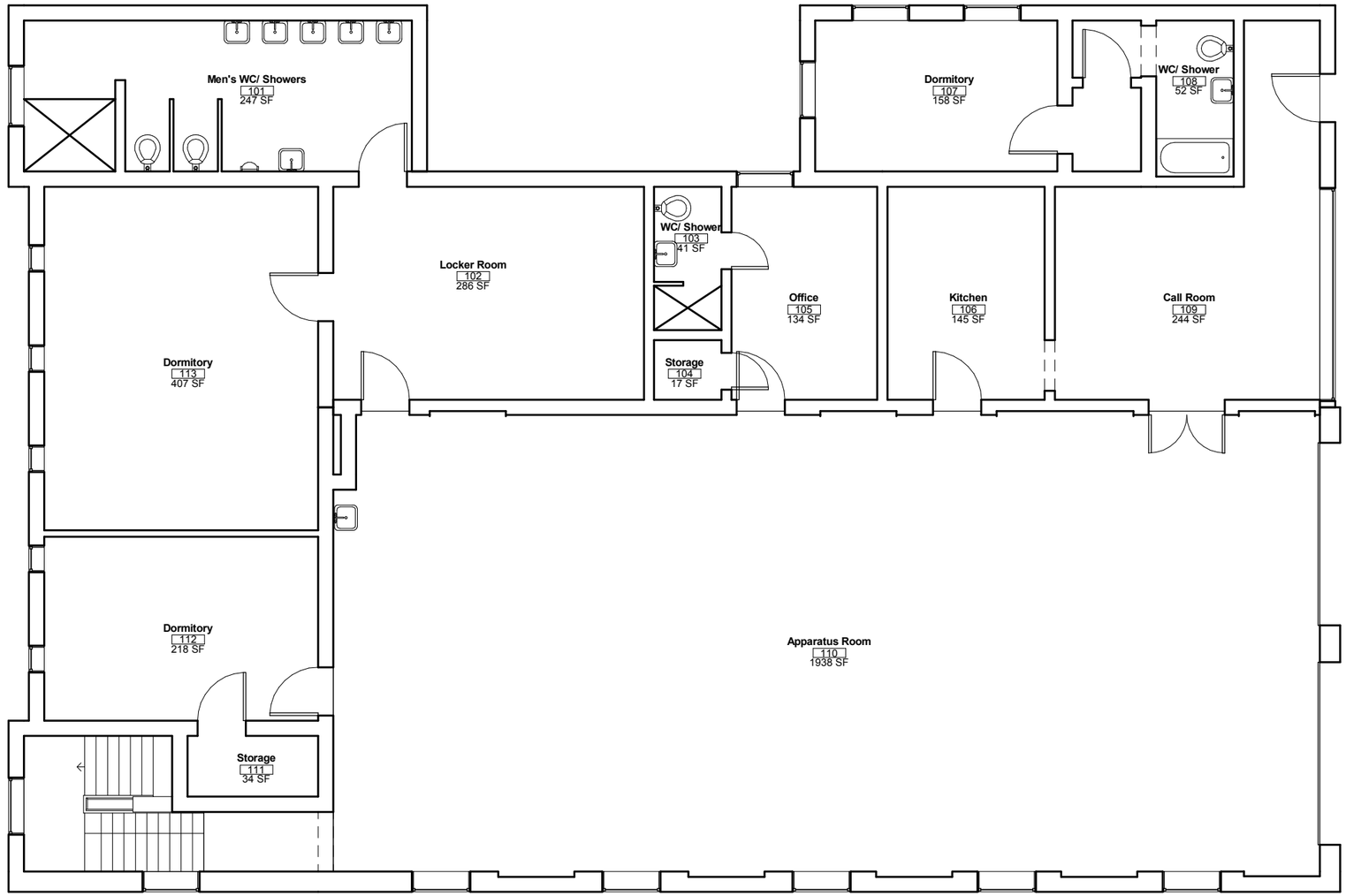
Firehouse 12

City of Pittsburgh

Basement Floor Plan

A1.00

Date	07/22/13	
Drawn by	AS	Scale 1/8" = 1'-0"



1 L1 Floor Plan
1/8" = 1'-0"

The drawings and related digital files are a schematic rendition of the existing conditions of the facility only. Please verify exact field conditions before using these for further construction and renovation work.

Massaro

Firehouse 12

City of Pittsburgh

L1 Floor Plan		A1.10
Date	07/22/13	
Drawn by	AS	Scale 1/8" = 1'-0"

The drawings and related digital files are a schematic rendition of the existing conditions of the facility only. Please verify exact field conditions before using these for further construction and renovation work.

Massaro

Firehouse 12

City of Pittsburgh

Site Plan		C1.01
Date	07/22/13	
Drawn by	AS	Scale 1/32" = 1'-0"

B124 - FIREHOUSE 12 / MEDIC 7

Tier II: Abbreviated Accessibility Survey

	Item	Yes	No	N/A	Comments
A. Building History					
1.	Has an ADA survey previously been completed for this property?	☐	☐	☑	
2.	Have any ADA improvements been made to the property?	☐	☐	☑	
3.	Does a Barrier Removal Plan exist for the property?	☐	☐	☑	
4.	Has the Barrier Removal Plan been reviewed/approved by an arms-length third party such as an engineering firm, architectural firm, building department, or other agency, etc.?	☐	☐	☑	
5.	Has building ownership or building management reported receiving any ADA related complaints that have not been resolved?	☐	☐	☑	
6.	Is any litigation pending related to ADA issues?	☐	☐	☑	
B. Parking					
1.	Are there sufficient accessible parking spaces with respect to the total number of reported spaces? *(See Table X2.1)*	☐	☑	☐	
2.	Are there sufficient van-accessible parking spaces available (96 in. wide by 60 in. aisle)? *(See Table X2.1)*	☐	☑	☐	
3.	Are accessible spaces marked with the International Symbol of Accessibility? Are there signs reading "Van Accessible" at van spaces?	☐	☐	☑	
4.	Is there at least one accessible route provided within the boundary of the site from public transportation stops, accessible parking spaces, passenger loading zones, if provided, and public streets and sidewalks?	☐	☑	☐	
5.	Do curbs on the accessible route have depressed, ramped curb cuts at drives, paths and drop-offs?	☑	☐	☐	
6.	Does signage exist directing you to accessible parking and an accessible building entrance?	☐	☑	☐	
C. Ramps → N/A					
1.	If there is a ramp from parking to an accessible building entrance, does it meet slope requirements? (1:12 slope or less)?	☐	☐	☐	
2.	Are ramps longer than 6 ft complete with railings on both sides?	☐	☐	☐	
3.	Is the width between railings at least 36 in.?	☐	☐	☐	
4.	Is there a level landing for every 30 ft horizontal length of ramp, at the top and at the bottom of ramps and switchbacks?	☐	☐	☐	
D. Entrances/Exits					
1.	Is the main accessible entrance doorway at least 32 in. wide?	☐	☐	☑	NOT ACCESSIBLE
2.	If the main entrance is inaccessible, are there alternate accessible entrances?	☐	☑	☐	
3.	Can the alternate accessible entrance be used independently?	☐	☐	☑	
4.	Is the door hardware easy to operate (lever/push type hardware, no twisting required, and not higher than 48 in. above floor)?	☐	☑	☐	
5.	Are main entry doors other than revolving doors available?	☑	☐	☐	
6.	If there are two main doors in series, is the minimum space between the doors 48 in. plus the width of any door swinging into the space?	☐	☐	☑	

FIG. X2.1 Abbreviated Accessibility Survey

Tier II: Abbreviated Accessibility Survey					
	Item	Yes	No	N/A	Comments
E. Paths of Travel					
1.	Is the main path of travel free of obstruction and wide enough for a wheelchair (at least 36 in. wide)?	☐	☑	☐	
2.	Does a visual scan of the main path of travel reveal any obstacles (phones, fountains, etc.) that protrude more than 4 in. into walkways or corridors?	☑	☐	☐	
3.	Is at least one wheelchair-accessible public telephone available?	☐	☑	☐	
4.	Are wheelchair-accessible facilities (toilet rooms, exits, etc.) identified with signage?	☐	☑	☐	
5	Is there a path of travel that does not require the use of stairs?	☐	☑	☐	
F. Elevators → N/A					
1.	Do the call buttons have visual signals to indicate when a call is registered and answered?	☐	☐	☐	
2.	Is the "UP" button above the "DOWN" button?	☐	☐	☐	
3.	Are there visual and audible signals inside cars indicating floor change?	☐	☐	☐	
4.	Are there standard raised and Braille markings on both jambs of each hoist way entrance?	☐	☐	☐	
5.	Do elevator doors have a reopening device that will stop and reopen a car door if an object or a person obstructs the door?	☐	☐	☐	
6.	Do elevator lobbies have visual and audible indicators of car arrival?	☐	☐	☐	
7.	Are elevator controls low enough to be reached from a wheelchair (48 in. front approach/54 in. side approach)?	☐	☐	☐	
8.	Are elevator control buttons designated by Braille and by raised standard alphabet characters (mounted to the left of the button)?	☐	☐	☐	
9.	If a two-way emergency communication system is provided within the elevator cab, is it usable without voice communication?	☐	☐	☐	
G. Toilet Rooms					
1.	Are common-area public toilet rooms located on an accessible route?	☐	☑	☑	
2.	Are door handles push/pull or lever types?	☐	☑	☐	
3.	Are there audible and visual fire alarm devices in the toilet rooms?	☐	☑	☐	
4.	Are corridor access doors wheelchair-accessible (at least 32 in. wide)?	☑	☑	☐	
5.	Are public toilet rooms large enough to accommodate a wheelchair turnaround (60 in. turning diameter)?	☐	☐	☑	
6.	In unisex toilet rooms, are there safety alarms with pull cords?	☐	☑	☐	
7.	Are toilet stall doors wheelchair-accessible (at least 32 in. wide)?	☐	☑	☐	
8.	Are grab bars provided in toilet stalls?	☐	☑	☐	
9.	Are sinks provided with clearance for a wheelchair to roll under (29 in. clearance)?	☐	☑	☐	
10.	Are sink handles operable with one hand without grasping, pinching, or twisting?	☐	☑	☐	
11.	Are exposed pipes under sinks sufficiently insulated against contact?	☐	☑	☐	
H. Guestrooms → N/A					
1.	Are there sufficient reported accessible sleeping rooms with respect to the total number of reported guestrooms? *(See Table X2.2)*	☐	☐	☐	
2.	Are there sufficient reported accessible rooms with roll-in showers with respect to the total number of reported accessible guestrooms? *(See Table X2.2)*	☐	☐	☐	

FIG. X2.1 Abbreviated Accessibility Survey *(continued)*

4.3 ASHRAE Level-1 Energy Audit

Executive Summary

The building systems for Firehouse 12 have been analyzed and evaluated according to ASHRAE Level-1 methodology and reporting requirements.

The following sections are complimentary to the PCR with additional focus on energy costing, benchmarking, and remediation planning. The detailed information as provided is of an initial nature according to the level-1 structure.

Methodology, calculations, standards, and reference material are drawn from these industry publications:

1. ASHRAE Procedures for Commercial Building Energy Audits -2011 Second Edition
2. ANSI/ASHRAE Standard 105-2007: Standard Methods of Measuring, Expressing, and Comparing Building Energy Performance
3. DOE/EIA US Energy Information Administration: U.S. Commercial Building Energy Intensity -2003 Table 7b.
4. Energy Star Target Finder tool
5. “Commercial Energy Auditing Reference Handbook”, Steven Doty, PE, CEM

Scope of Work

The scope-of-work associated with the ASHRAE Level-1 includes the following items.

- Conduct walk-through survey: Completed see - PCR
- Identify low-cost/no-cost recommendations: Completed see - PCR
- Identify capital improvements and potential EEM’s: Completed - see PCR
- PEA analysis
- Energy Systems Condition Assessment
- Utility rate structure commodity programs
- EUI target and comparative evaluation
- Potential savings from new EUI target
- Proposed Action Plan: Phase #1

Preliminary Energy Analysis (PEA)

Historical Energy Consumption by Year and Type:

2011 - Electricity

YEAR: 2011

Month	Cooling Degree Days	Billed Demand (kW)	Electric Use (kWh)	Demand Cost ($)	Total Bill ($)
January	0	11.9	3210	-	$302
February	0	11.2	2850	-	$272
March	0	11	2650	-	$256
April	21	12.2	3010	-	$289
May	94	12.2	3280	-	$328
June	182	13.1	4880	-	$456
July	397	14.7	4930	-	$474
August	206	15.7	5580	-	$531
September	78	14.1	3950	-	$394
October	0	11.5	3210	-	$320
November	0	11.8	3250	-	$325
December	0	11	3240	-	$319
		Annual Totals	**44,040**	**$0**	**$4,266**

2011 - Natural Gas

YEAR: 2011

Month	Heating Degree Days	MCF	Therms	Total Bill ($)
January	1240	115.1	1151	$1,146
February	917	94.4	944	$946
March	781	76.1	761	$755
April	350	27.3	273	$287
May	138	6.2	62	$80
June	12	2.2	22	$45
July	0	3	30	$53
August	1	3	30	$31
September	87	8.4	84	$45
October	401	42.8	428	$194
November	532	13.3	133	$152
December	849	176.1	1761	$1,648
		Annual Totals	**5,679**	**$5,381**

2012 - Electricity

YEAR: 2012

Month	Cooling Degree Days	Billed Demand (kW)	Electric Use (kWh)	Demand Cost ($)	Total Bill ($)
January	0	10.1	3300	-	$318
February	0	9.4	2500	-	$252
March	4	8.8	2520	-	$250
April	7	8.7	2630	-	$258
May	114	10.6	3040	-	$301
June	181	10.8	3950	-	$373
July	347	11.8	5250	-	$485
August	226	13.4	5150	-	$487
September	110	12	4180	-	$404
October	24	9.1	2670	-	$267
November	0	8.6	2710	-	$266
December	0	8.1	2780	-	$269
		Annual Totals	**40,680**	**$0**	**$3,928**

2012 - Natural Gas

YEAR: 2012

Month	Heating Degree Days	MCF	Therms	Total Bill ($)
January	993	27.9	279	$280
February	860	165	1650	$1,545
March	430	38.9	389	$377
April	456	22.4	224	$226
May	60	5.8	58	$76
June	29	9.3	93	$107
July	0	3	30	$50
August	1	3.9	39	$58
September	107	2.8	28	$48
October	343	46.4	464	$457
November	719	51	510	$442
December	795	112.8	1128	$946
		Annual Totals	**4,892**	**$4,613**

2013 - Electricity

YEAR: 2013

Month	Cooling Degree Days	Billed Demand (kW)	Electric Use (kWh)	Demand Cost ($)	Total Bill ($)
January	0	8.1	3020	-	$288
February	0	10.7	2490	-	$263
March	0	9.5	2720	-	$274
April	22	10	3130	-	$309
May	92	12.9	3090	-	$324
June	175	12.5	4170	-	$374
July	-	-	-	-	-
August	-	-	-	-	-
September	-	-	-	-	-
October	-	-	-	-	-
November	-	-	-	-	-
December	-	-	-	-	-
Annual Sub-Totals			**18,620**	**$0**	**$1,832**

2013 - Natural Gas

YEAR: 2013

Month	Heating Degree Days	MCF	Therms	Total Bill ($)
January	988	111.2	1112	$933
February	998	106.1	1061	$891
March	911	73.4	734	$624
April	360	40.8	408	$363
May	151	13.4	134	$64
June	12	0	0	-
July	-	-	-	-
August	-	-	-	-
September	-	-	-	-
October	-	-	-	-
November	-	-	-	-
December	-	-	-	-
Annual Sub-Totals			**3,449**	**$2,875**

Energy Performance Summary

The EUI values include in the performance summary below have been calculated using ASHRAE forms and formulas. Due to the low sampling response for Public order and Safety facilities in the northeast sector, the direct and literal application of these calculations is not advisable. The sections that follow will establish more a realistic target value in the context of a phased energy reduction program. The significant differences in these EUI rating will be treated in terms of potential opportunity.
The total annual cost information data source is the client provided utility bill spread sheet.

ENERGY PERFORMANCE SUMMARY
Commercial Building Energy Audit Sample Forms

Energy Type	Total Annual Use	Units	Conversion Multiplier	kBtu	Total Annual Cost ($)
Electricity	44,430	kWh	3.412142	151,601	$ 4,299.72
Natural Gas	5,470	Therms	100	547,000	$ 5,002.23
Purchased Steam			0	-	
Purchased Hot Water			0	-	
Purchased Chilled Water			0	-	
Oil #:			0	-	
Propane			0	-	
Coal			0	-	
Thermal—On-Site Generated			0	-	
Other			0	-	
Electricity—On-Site Generated			0	-	
Thermal or Electricity—Exported			0	-	
				-	
Total				**698,601**	**$ 9,301.94**

Gross Conditioned Area	**3921**
EUI (kBtu/ft^2)	**178.17**
Target Finder Score*	**145**
CBECS EUI (for comparable , kBtu/ft^2)	**88.3**
ECI ($/ft^2)	**$ 1.77**

Notes: The CBECS sampling pool for Public Order and Safety facilities is limited for buildings in the North East sectors and must be interpted accordingly.

Energy Systems Condition Assessment

The energy systems condition assessment is an additional effort beyond the scope of the ASTM PCA standard and the typical ASHRAE Level-1 requirements. It is a basis for a targeted audit as referred to in ASHRAE standard. This approach supplements the PCR and formal Level-1 to develop a credible EUI target and an actionable remediation program.

This section also provides an initial performance assessment of energy consuming systems and devices as part of the targeted audit effort.

Heating System

Energy System Condition: Boiler system including pump(s), piping, and room radiators - **Derelict**
Boiler System Deficiencies

- Combustion Efficiency: **Poor**
- Age: Near EUL see PCR
- Maintenance Condition: **Poor** see PCR
- Piping System Insulation: **None**

Control System Deficiencies

- Space Set-Point Control: **Poor**. Uncalibrated thermostat, excessive set-point temperatures, and open occupant adjustment
- Boiler Water Set-Point Control: **Poor**. Decommissioned controls, see PCR.
- Set-Back Controls: **None**
- Weekly Scheduling Controls: **None**

Energy Management System Deficiencies

- Active Energy Monitoring and Management System: **None**

Cooling System

Energy System Condition: Room Cooling Units (WACU) - **Derelict**
WACU Deficiencies

- Efficiency: **Poor**
- Age: Near EUL see PCR
- Maintenance Condition: **Poor** see PCR

Control System Deficiencies

- Space Set-Point Control: **Poor**. Uncalibrated integral thermostat, excessive set-point temperatures, and open occupant adjustment
- Set-Back Controls: **None**
- Weekly Scheduling Controls: **None**

Energy Management System Deficiencies

- Active Energy Monitoring and Management System: **None**

Lighting System

Energy System Condition: Interior Lighting - **Poor**
Fixture Deficiencies

- Lamp Efficiency: **Good**
- Ballast Efficiency: **Poor**
- Age: Near EUL see PCR
- Maintenance Condition: **Poor** see PCR

Control System Deficiencies

- Occupancy Controls: **None**
- Weekly Scheduling Controls: **None**

Energy Management System Deficiencies

- Active Energy Monitoring and Management System: **None**

Potable Water System

Energy System Condition: Water heating and piping - **Derelict**
Heater System Deficiencies

- Combustion Efficiency: **Poor**
- Age: Near EUL see PCR
- Maintenance Condition: **Poor** see PCR
- Piping System Insulation: **None**

Control System Deficiencies

- Set-Back Controls: **None**
- Weekly Scheduling Controls: **None**

Energy Management System Deficiencies

- Active Energy Monitoring and Management System: **None**

Utility rate structure commodity programs

The energy billing and cost data received to date are understood to be directly from local, single source utility companies. Energy rate structures may be reduced through a commodity sourcing approach. Such an approach could include natural gas and electrical energy brokering services. While such services have been successful in reducing cost per kWH and MCF, additional risk of such approach must be carefully considered. It would be expected that energy rate costs could be reduced from 10-15% in a city wide contract. However, such saving would typically require Smart Metering and potential interruption in service, which may not be compatible or acceptable for emergency services facilities. However, full consideration should be given to 'bidding' Natural Gas supply as contractual arrangement may be more acceptable. Further, alternative energy supply opportunities should be explored as peak season interruption obligations are in a state of change, which often favors the consumer.

EUI target and comparative evaluation

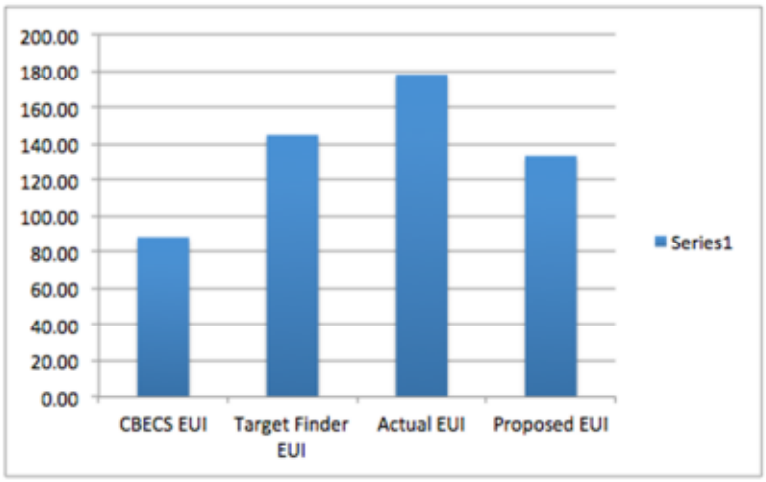
The EUI for Firehouse 12 is calculated at 178.17 kBtu/Ft2.

The CBECS (Commercial Building Energy Consumption Survey) and 'Target Finder' scores, calculated in the above ASHRAE Energy Performance Summary section, conflict with empirical evidence provided by utility consumption data, Degree-day weather patterns, and the energy systems condition assessment. However, these EUI ratings are useful as bracketing limits.

Basement areas are occasionally occupied, and without extensive terminal heating units, and are not treated formally as conditioned spaces.

An EUI of 133.63 is proposed as an initial working target pending level-2 modeling or future on-site system sub-metering and data logging efforts.

CBECS EUI	88.30
Target Finder EUI	145.00
Actual EUI	178.17
Proposed EUI	133.63



Potential savings from achieving proposed EUI target

Energy Type	Total Annual Use (EUI=95)	Units	Conversion Multiplier	kBtu	Total Annual Cost ($)
Electricity	33,323	kWh	3.412142	113,703	$ 3,224.85
Natural Gas	4,103	therms	100	410,258	$ 3,751.74
Purchased Steam			0	-	
Purchased Hot Water			0	-	
Purchased Chilled Water			0	-	
Oil #:			0	-	
Propane			0	-	
Coal			0	-	
Thermal—On-Site Generated			0	-	
Other			0	-	
Electricity—On-Site Generated			0	-	
Thermal or Electricity—Exported			0	-	
			0	-	
New Total				**523,961**	**$ 6,976.59**

Gross Conditioned Area*	**3921**
Actual EUI (kBtu/ft^2)	**178.17**
Proposed EUI (kBtu/ft^2)	**133.63**
Proposed ECI ($/ft^2)	**$ 1.78**

*Gross Conditioned Area excludes basement level, and the basis of the EUI calculations. Total building area including basement is 7,634 SF.

Proposed action plan: Phase #1

Scope: Wireless, WEB based energy management system with wireless instruments including:

- One (1) Boiler Control
- Three (3) Room level heating radiator controls
- Three (3) Lighting controls
- Three (3) Cooling controls
- Set-point, set-back, and scheduling controls
- Insulate basement level hot water supply piping
- Insulate basement level domestic water piping
- Insulate/Close-off (95%) Hose Tower lower opening