CITY OF

# PITTSBURGH

## PROPERTY CONDITION REPORT

**B110 – Firehouse 14**

259 McKee Place

Pittsburgh, Pennsylvania 15213

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 Central Oakland neighborhood at 259 McKee Street, Pittsburgh, PA. A walk-through survey of the subject property was conducted on July 9, 2013.

The subject property consists of a 1-story fire station with basement; containing an apparatus room, storage, break room, lockers and offices. The building was constructed in 1944. The property is on a 0.3 AC municipal lot that includes a former police station that abuts the fire station. The police station is currently leased and occupied by the Oakland Career Center, and is incorporated in this assessment.

## 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 masonry enclosure is in disrepair and in need of restoration.
- The roofing system is in disrepair and will need replaced within 5 years.
- The masonry parapets will need rebuilt during the proposed roofing replacement.
- The apparatus room slab needs repair and waterproofing.
- The boiler and hot water heater lack provision for combustion air.
- 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 #B110 - Firehouse 14. OAKLAND**
**MCMS Project No. 13-707.05**

| Section | Item | Quantity | Unit | Unit Cost | Cycle Replacement | Replacement % | Immediate Total | Short-Term Total |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| **3.1** | **SITE** | | | | | | | |
| a | Clear vegetation, prep and paint guardrails and well grates. | 1 | EA | $3,000 | | | $3,000 | |
| b | Clear and repair trench drains | 1 | EA | $2,500 | | | $2,500 | |
| c | Concrete paving repairs and joint sealant. | 1 | EA | $4,000 | | | $4,000 | |
| d | Remove overgrown vegetation at NW | 1 | EA | $0 | | | | |
| e | Replace flagpole | 1 | EA | $5,000 | | | | $5,000 |
| | | | | | | | | |
| **3.2** | **SUBSTRUCTURE** | | | | | | | |
| | | | | | | | | |
| **3.3** | **SHELL** | | | | | | | |
| a | Seal cracks and waterproof apparatus bay slab | 1 | EA | $7,500 | | | | $7,500 |
| b | Masonry restoration, lintel replacement, sealants | 1 | EA | $270,000 | | | | $270,000 |
| c | Remove and Replace Roof Deck | 4,420 | EA | $66 | | | | $291,720 |
| d | Replace roofing system (5yrs) | 4,420 | SF | $28 | | | | $121,550 |
| e | Repair existing roof defect at Firehouse roof | 1 | EA | $3,000 | | | | $3,000 |
| | | | | | | | | |
| **3.4** | **INTERIORS** | | | | | | | |
| a | Provide warning signage and protection at low headroom over Firehouse stair | 1 | EA | $150 | | | $150 | |
| | | | | | | | | |
| **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 | |
| d | Provide combustion air ductwork per code. | 1 | EA | $9,000 | | | $9,000 | |
| | | | | | | | | |
| | | | | | | | | |
| | **Fire Protection** | | | | | | | |
| e | Add Fire Alarm devices and fire extinguishers | 1 | EA | $1,800 | | | | $1,800 |
| f | GFI receptacles | 1 | EA | $1,800 | | | | $1,800 |
| g | Emergency Light/sign fixtures | 1 | EA | $2,750 | | | | $2,750 |
| h | CO detector in Boiler Room | 1 | EA | $3,500 | | | | $3,500 |
| | | | | | | | | |
| | **Electrical** | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| **3.6** | **EQUIPMENT AND FURNISHINGS** | | | | | | | |
| **3.7** | **SPECIAL CONSTRUCTION** | | | | | | | |
| | | | | | | | | |
| | | | | | | **TOTALS** | **$23,000** | **$708,620** |

# 2 Team, Purpose and Scope

## 2.1 PCA Team

**Team Lead, Site, Architectural, Accessibility, Drawings:**
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## 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: architectural drawings dated 1944 for the Firehouse, as well as architectural drawings dated 2012 for interior alterations to the abutting former police station now leased by Oakland Career Center. 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 an approximately one-third acre (0.3AC) parcel containing both the Firehouse and an adjoining (but not internally connected) former police station. Overall the Site is in Fair condition.

1. Topography and Drainage – The site is relatively flat, rising slightly from McKee Place along Louisa St. The site appears to be positively drained away from the building. Trench drains along McKee and Louisa appear to be full of sediment. Window well railings and gratings need painted

   Recommendation – Clean and repair trench drains. Prep and paint railings and well gratings.

2. Access and Egress – Vehicle access to the subject property is available from McKee Pl. Egress from the building to grade is available from the first level only.

3. Paving, Curbing and Parking – The site paving and adjacent sidewalks are concrete and generally in Poor condition. Concrete apron has areas of joint spalling and vegetation growing in joints, the apron is spalled at the bollards due to a lack of expansion joint material. Cracks, differential settlement and joint dislocations are evident throughout. Five (5) informal (unlined) parking spaces are accessible from McKee Pl. and available for FD. Accessible parking is NOT available. Concrete apron has areas of joint spalling and vegetation growing in joints, the apron is spalled at the bollards due to a lack of expansion joint material.

   Recommendation: Repair / Replace broken and settled concrete paving and walks. Seal all joints.

4. Landscaping and Appurtenances – Landscaping and plantings consist primarily of grass lawns and several planting beds. Unimproved vegetation and invasive trees overgrown along the NW side of the building limit access for maintenance.

   Recommendation: Cut back overgrown vegetation.

5. Site Amenities / Accessory Structures- A low-rise segmental retaining wall in Good condition runs along the west side of the drive. The flagpole on site is heavily rusted and in need of replacement.

   Recommendation: Replace the flagpole.

## 3.1 Site: Photos

ST1 – Overgrown vegetation along NW side

ST2 – View from McKee Place, flagpole in foreground

ST3 – Looking NE along Louisa St.

ST4 – Former Police Station, now Oakland Career Center, looking NW along Semple St.

ST5 – Trench drain filled with sediment

ST6 – Concrete pavement – differential settlement, open joints

## 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
    a. Constructed of masonry - Good condition: the basement walls have a few light cracks.
    b. NW wall has window wells constructed of concrete; they contain debris but are in Good condition.
2. Slab on grade: The basement floor is concrete and has some light cracks.

## 3.3 Shell

1. Overall the Shell is in POOR condition.

2. Building Frame & Floors

   2.1. The first floor of the entire building is constructed of reinforced concrete T-Beams with a center structural wall running west to east.
   2.2. The concrete reinforced concrete T Beams are in good condition they have areas of light cracks, light spalls, and exposed rebar that are in good condition.
   2.3. The first floor decking of the fire station garage bay has had a topping slab applied. The topping slab has 1/16" to 3/8" longitudinal and transverse cracks. There is also light map cracking at the expansion joint along the center of the bays
   2.4. The first floor decking of the rental space is in good condition; a few light cracks and spalls exist but have been painted over.
   2.5. The fire station bays have a 4'x4' hole in roof that has been sealed over
   2.6. The concrete encased steel roof beams have patches on the encasement, no steel is visible
   2.7. The concrete roof decking has patches, but otherwise is good condition

   Recommendation - Fire Station Apparatus Room slab cracks should be sealed with epoxy injection and floor waterproofed with sealer to prevent deterioration to floor slab and RC T Beams

3. Building Façade

   3.1 Construction: The building walls are constructed with brick masonry. Wall penetrations include: 5 metal man doors, 2 garage doors, 29 windows, 16 glass block windows and 4 ground level skylights on the east end. All doors and windows have metal frames.
   3.2 There are areas on west wall and the western half of the north and south walls with light brick cracking, step cracking, brick bulging at lintels and areas of minimal brick displacement
   3.3 The joint on the south wall between the police station and firehouse is open 3/8" full height with the cap stone displaced 1/4"
   3.4 Parapets are in poor condition with brick cracking and cap stone misalignment
      3.4.1 Exterior metal man doors are in good condition. There is light spall in the door trim at the rental area on the south east wall
      3.4.2 Window lintels have light/ heavy rust with areas of bulging brick, loss of mortar and minimal brick displacement.

   Recommendations

   - Parapets need to be programmed for replacement, align with roof replacement.
   - Masonry restoration including replacing lintels and sealing open joints

4. Roof Deck

   4.1. Construction: Metal edged gyp plank roof decking is installed on the roofs above Fire House 14 (west end older building). The roof deck on the newer east end was not visible. There is no apparent slope to the drains.

   4.2. Condition: No conditions were observed that would indicate deck problems. The metal edges on the gyp planks are rusted.

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. The roof system on the Oakland Career Center is constructed with a white TPO single ply membrane. The roof system on Firehouse 14 is constructed of a Modified Bitumen membrane with a black granule surface.

6.2. Condition: The roof membrane on the Oakland Career Center appeared in fair condition. The roof system on Firehouse 14 appeared in poor condition. The modified bitumen system on the Firehouse contains numerous ridges and blisters.

7. Membrane flashings

7.1. Construction: The perimeter and curb flashings are constructed with the same membranes as used on the roofs.

7.2. Condition: The membrane flashing systems on the Oakland Career Center are in fair condition. The membrane flashing systems on the Firehouse are in poor condition. The flashing is loose from the wall and buckled (wrinkles) in some areas with numerous open vertical joints. The flashing extends up and over top the metal coping. Numerous repairs were observed. Repairs were made using roof cement only and have failed and are open.

8. Perimeter Terminations

8.1. Construction: The building walls extend above the roof line creating a parapet on the exterior walls of both roof areas. The parapet walls on the Firehouse are terminated with metal coping that has been covered by membrane flashing. The parapet walls on the Oakland Career Center are terminated with metal coping that was installed overtop of existing limestone coping. The interior higher wall flashing is terminated with metal bar on the Firehouse and with metal counter flashing on the Career Center.

8.2. Condition: I could not observe the metal coping except for the exterior face on the Firehouse. The metal coping appears in fair condition. The mortar bed joint on the original limestone coping is deteriorating.

9. Roof Top Penetrations

9.1. Firehouse 14: 6 vent pipes and two surface mounted condensers. Careen Center: 5 vent pipes, 6 pitch pockets, and 2 HVAC units.

9.2. Condition: The penetrations are in fair condition.

10. Drainage System

10.1. Construction: The high bay roof on Firehouse 14 drains into 4 through wall scuppers and into conductor heads with downspouts onto the roofs below. The balance of the roof drains into interior roof drains (Firehouse 14 – 4 drains, Career Center – 5 drains). There is no apparent slope to the drains.

10.2. Condition: Firehouse 14: The north side low roof area is covered with ponded water, water ponds at all drains, 1 drain on the south side and both drains on the north side appear clogged. Career Center: There is some minor ponding but the drains appear to be operating properly.

11. Access

    11.1. Providing an extension ladder is the only access to the roofs.

**CONCLUSIONS**

Occasional leaks are reported in the Firehouse and none in the Career Center.

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

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

The roof membrane and flashing systems are in poor condition on the Firehouse and in fair condition on the Career Center. The open, loose and buckled flashing on the Firehouse areas should be monitored and repaired until the roof is replaced.

The metal coping is covered with roof membrane and should be monitored and repaired until the roof is replaced.

The roof top units and penetrations are in fair condition.

The drainage system is in fair condition. The clogged drains on the Firehouse should be cleaned. The debris should be cleaned from the roof surface and continue to be cleaned twice yearly.

With proper Maintenance and corrective repairs, it is our opinion that the Firehouse roofing system is in a maintainable condition for the next five years and the Career Center roofing system is in a maintainable condition for the next ten years.

Estimates

1 year: Repair existing roof defects - Estimated cost: $3,000. Replace caulking and sealant at doors and windows – 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 Firehouse 14 roofing and flashing system – Estimated cost: $79,560 (4,420 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 – NW wall +/- 2' from corner – light vertical crack full height

SH2 – Center pier at apparatus doors; bulging brick above lintels

SH3 – SW wall - Step cracking from window lintel, Light Vertical crack from lintel to coping, rusted lintel

SH4 – SE corner @ upper level – step cracking from lintel

SH5 – SE corner @ upper level – missing sealant

SH6 – NE wall above Career Center – missing sealant

## 3.3 – Shell: Photos Continued


SH7 – View from above – Firehouse 14 at left, Career Center (white roof) at right

SH8 – SE lower roof looking SW

SH9 – SE lower roof looking NE – ponding water

SH10 – Upper roof looking NE – ponding water

SH11 – Upper roof; ponding water, open and loose flashing

SH12 – NW lower roof looking NW – ponding water all drains clogged

## 3.3 – Shell: Photos Continued – Career Center roof

SH13 – Upper roof looking S

SH14 – Lower roof looking S

SH15 – View from upper roof looking NE

SH16 – View from upper roof looking NE

SH17 – Lower roof looking SW

SH18 – Lower roof – debris at roof drain

## 3.4 Interiors

**Firehouse 14**

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. However, the Firehouse stair has dangerously low headroom and does not comply with current code.

   Recommendation – Provide warning signage and protection at low structure above stair.

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/locker room flooring is ceramic tile. Ceilings are typically cement plaster throughout and are in Good condition.

**Oakland Career Center**

1. Renovations to the Career Center were completed in 2012. The interior construction and finishes in the Career Center are in New or Good condition.

## 3.4 Interiors: Photos


I1 – Apparatus bay

I2 – Dormitory

I3 – Locker area

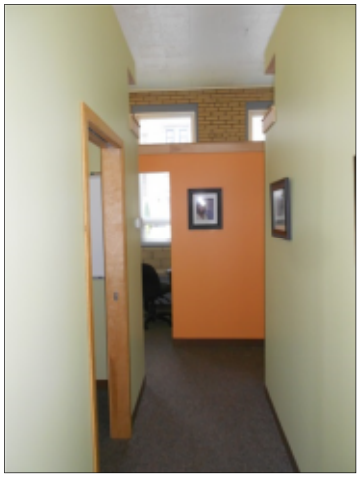

I4 – Office

I5 – Lower level – fitness center

I6 – Lower level – storage / work room

## 3.4 Interiors: Photos Continued – Career Center


I7 – Entry corridor



I8 – Interior offices

I9 – Office

I10 – Corridor to offices / interior stair down

I11 – Multipurpose Room

I12 – Lower level - training center

## 3.5 Services - Plumbing

**Building Plumbing Systems**

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. Six (6) lavatory sinks
      1.2.3. One (1) urinal
      1.2.4. Four (4) shower heads
      1.2.5. One (1) kitchen type sinks
      1.2.6. One (1) janitor's sink
      1.2.7. One (1) wash machine (laundry)
      1.2.8. One (1) laundry sink
   1.3. Condition Assessment
      1.3.1. Condition: **Fair**

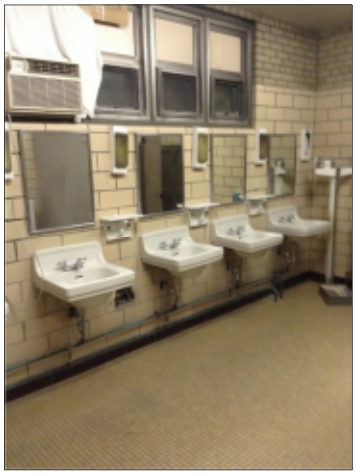
2. Domestic Water Production
   2.1 Construction: The domestic water heating system is served by one A.O. Smith (1) 50 gallon, commercial water heater and supply piping.

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

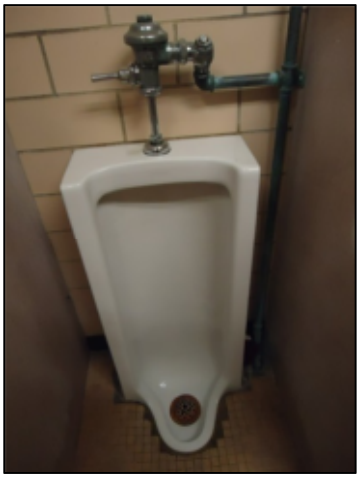
5. Estimates: Suggested remedies and Opinion of probable cost
   5.1 De minimus conditions
      5.1.1 Insulate supply pipes from water heaters.
   5.2 Immediate Costs
      5.2.1 Install back-flow preventer: $2,000.

## 3.5 Services Photos - Plumbing



P1 – Lavatory sinks - Typical

P2 – Locker area showers - Typical



P3 – Urinal - Typical

P4 – Service sink

P5 – Water meter, pressure reducer and shut-off valve

P6 – Domestic water heater

**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.

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.

Condition: Room terminal units - **Poor**

| | | |
|---|---|---|
| 1.1.1. Physical Deficiencies: | No RAD Control Valves | |
| 1.1.2. Functional Deficiencies: | None reported or observed | |
| 1.1.3. Performance Deficiencies: | None reported or observed | |
| 1.1.4. Maintenance observations: | WACU casing corrosion | |
| 1.1.5. Remaining useful life observations (RUL) | WACU: | 1-3 years |
| | Heating, Cooling, Ventilation: | 5+ years |
| | 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.

Construction:
Hot water piping: Black steel
Piping Insulation: None Observed
One (1) Pump: Factional HP, in-line centrifugal
Pump controls: Partially de-commissioned

Condition: Heating distribution system - **Poor**

| | | |
|---|---|---|
| Physical Deficiencies: | No piping insulation | |
| Functional Deficiencies: | None reported or observed | |
| Performance Deficiencies: | None reported or observed | |
| Maintenance observations: | None reported or observed | |
| Remaining useful life observations (RUL) | Pumps: | 3-5 years |

1.3. Central Boiler System:

Construction: The hot water system consists of one (1) Crane 630 MBH 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 certificate is displayed but out-of-date. The hot water heating control system consists of original, partially decommissioned field mounted devices.

Condition: Central Boiler - **Poor**

| | |
|---|---|
| Safety Concerns: | Boiler permit, Boiler safety controls testing |
| Code non-compliance issues: | No Dedicated combustion air system |
| Physical Deficiencies: | None reported or observed |
| Functional Deficiencies: | Simultaneous heating and cooling |
| Performance Deficiencies: | OA reset |
| Maintenance observations: | Boiler general condition |
| Remaining useful life observations (RUL): | 1-3 years |

1.4. Controls

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.

Condition: Controls - **Poor**

1.5. Performance Observations: 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.

1.6. Utilities
General Description: Natural gas.
Construction: Low pressure natural gas meter and associated threaded, black steel piping.
Condition Assessment: **Fair**

1.7. Conclusion: The HVAC system as a whole is in **Poor** condition.

1.8. Estimates: Suggested remedies and Opinions of Probable Cost

De minimus conditions
Boiler Safety Testing: $250 (Fire and Ice heating)

Immediate Costs
Calibrate Thermostats: $800
Combustion air for boiler and water heater: $7,500

Short-Term Costs
MER Insulation (Armaflex type): $2,000

## 3.5 Services Photos – HVAC

H 1 – HW Radiator – Apparatus Room - Typical

H 2 – Direct Connect Vehicle Exhaust System (DCVEX)

H 3 – Dormitory WACU - Typical

H 4 – HW Radiator Dormitory - Typical

H 5 – HW Heating Boiler

H 6 – Lower level WACU and HW Radiator

## 3.5 Services - Fire Protection

**Building Fire Protection and Life Safety Systems**

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. No observable fire extinguishers present. **Potential Code Violation.**

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.**
   3.3. No observable fire pull-stations present.

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. No observable emergency lighting present. **Potential Code Violation.**

7. Ground Fault Interruption
   7.1. GFI's not present in all kitchen and laundry connections. **Potential Code Violation.**

8. Conclusions:
   8.1. The building fire protection and life safety systems are physically deficient. **Multiple potential code violations due to lack of devices and systems.**

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 – LED type: $1,800
      9.2.4. Add a minimum of five (5) emergency light/sign fixtures – LED type: $1,800
      9.2.5. Add Carbon Monoxide Detector-Alarm in Boiler Room: $3,500

## 3.5 Services - Electrical

### Building Electrical Systems

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 | 4 | Recess | 4' | Fluor. | 40 | 2 | T12 | 256 | Man Sw, Mag Bal, 8'AFF |
| Apparatus Room (a) | 10 | Suspend | 4' | Fluor. | 40 | 2 | T12 | - | Man Sw, Mag Bal |
| Apparatus Room (b) | 3 | Suspend | 8' | Fluor. | 80 | 1 | T12 | - | Man Sw, Mag Bal |
| Apparatus Room (c) | 1 | Surface | 4' | CFL | 40 | 4 | T12 | 960 | Man Sw |
| Stairwell (a) | 1 | Surface | 2' | Fluor. | 32 | 1 | T12 | - | Circular Lamp |
| Stairwell (b) | 1 | Surface | 4' | Fluor. | 40 | 2 | T12 | 90 | Man Sw, Mag Bal, 8'AFF |
| Lunchroom (a) | 1 | Recess | 4' | Fluor. | 32 | 4 | T8 | - | Man Sw, Mag Bal, 8'AFF |
| Lunchroom (b) | 1 | Recess | 4' | Fluor. | 40 | 4 | T12 | 230 | Man Sw, Mag Bal, 8'AFF |
| Chiefs Office (a) | 2 | Recess | 4' | Fluor. | 40 | 2 | T12 | - | Man Sw, Mag Bal, 8'AFF |
| Chiefs Office (b) | 2 | Recess | 4' | Fluor. | 40 | 1 | T12 | 192 | Man Sw, Mag Bal, 8'AFF |
| Captains Office (a) | 1 | Recess | 2' | Fluor. | 32 | 2 | T8 | - | Man Sw, Mag Bal, 8'AFF |
| Captains Office (b) | 2 | Recess | 4' | Fluor. | 40 | 4 | T12 | - | Man Sw, Mag Bal, 8'AFF |
| Captains Office (c) | 1 | Surface | na | Incand. | 75 | 1 | na | 367 | Man Sw, Mag Bal, 8'AFF |
| Lounge (a) | 2 | Recess | 2' | Fluor. | 40 | 2 | T12 | - | Man Sw, Mag Bal, 8'AFF |
| Lounge (b) | 2 | Recess | 4' | Fluor. | 40 | 4 | T12 | - | Man Sw, Mag Bal, 8'AFF |
| Lounge (c) | 2 | Recess | 4' | Fluor. | 40 | 1 | T12 | 448 | Man Sw, Mag Bal, 8'AFF |
| Entrance | 1 | Surface | na | Task | 75 | 1 | na | 75 | Man Sw |
| Dormitory | 3 | Surface | 2' | Fluor. | 40 | 2 | T12 | 192 | Man Sw, Mag Bal, 8'AFF |
| Locker Room | 1 | Surface | 2' | Fluor. | 40 | 2 | T12 | 64 | Man Sw, Mag Bal, 8'AFF |
| Weight Room (a) | 2 | Suspend | 4' | Fluor. | 40 | 2 | T12 | - | Man Sw, Mag Bal, 8'AFF |
| Weight Room (b) | 4 | Suspend | 8' | Fluor. | 80 | 2 | T12 | 640 | Man Sw, Mag Bal, 8'AFF |
| Storage | 1 | Surface | na | Incand. | 75 | 1 | na | 75 | Man Sw |
| Boiler Room (a) | 2 | Suspend | 2' | Fluor. | 32 | 1 | T8 | - | Circular Lamp |
| Boiler Room (b) | 1 | Suspend | 8' | Fluor. | 80 | 2 | T12 | - | Man Sw, Mag Bal |
| Boiler Room (c) | 1 | Surface | na | Incand. | 75 | 1 | na | 239 | Man Sw |
| Coal Storage | 1 | Surface | na | Incand. | 75 | 1 | na | 75 | Man Sw |
| Laundry - Work Room (a) | 3 | Surface | 4' | Fluor. | 40 | 4 | T12 | - | Man Sw, Mag Bal |
| Laundry - Work Room (b) | 2 | Surface | 4' | Fluor. | 40 | 2 | T12 | - | Man Sw, Mag Bal |
| Laundry - Work Room (c) | 1 | Suspend | 8' | Fluor. | 80 | 2 | T12 | 640 | Man Sw, Mag Bal |

Note #1: Two (2) total lamps out

AFF = Mounting Height Above Finished Floor
Flour = Fluorescent
Length = Standard Fixture Length
Mag Bal = Magnetic Ballast
Man Sw = Manual Wall Switch
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**

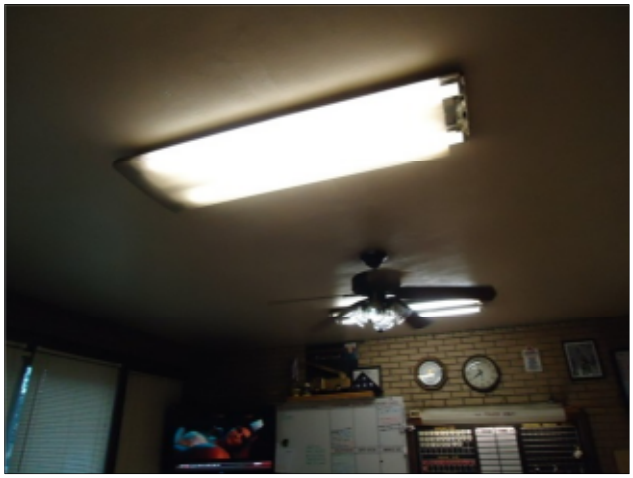
3. Utilities Service
3.1. Construction
3.1.1. One (1) 3-phase original electric service.
3.2. Condition Assessment
3.2.1. Condition Power Service: **Fair**
3.2.2. Condition Electric Meter: **Good**

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.
5.1.2. Add occupancy sensors for dormitories and work areas: $1,700

## 3.5 Services Photos – Electrical

E 1 – Lighting – Apparatus Room



E 2 – Lighting - Lounge

E 3 – Lighting Lower level work room

E 4 – Power service entrance


E 5 – Meter

E 6 – Main power panel

**Building Mechanical Systems: HVAC 4.5.1**

1. HVAC System – General Description: Primary space HVAC for Career Center is supplied by a central hot water heating system, Roof-top HVAC packed units (RTU), and Split-system Air Handlers (AHU). It is comprised of central equipment, zone level equipment, distribution systems, room level terminal units, and Direct Digital Controls (DDC). The boiler, piping, RTU's, AHU's with split-system air cooled condensing units (ACCU), and DDC controls are new. Room terminal units are a combination of pre-existing and new.

   1.1. Room level terminal units: Room based heating terminals are comprised of various combinations of hot water convectors, supply diffusers, return air grills, exhaust grills, and exhaust fans. Individual room heating convectors are interconnected with hot water supply and return distribution piping. Individual air terminals are interconnected with supply air ducts and return air plenums.

   1.1.1. Construction Room terminal units - Heating Convectors: *Existing* baseboard and radiators without zone control valves.
   1.1.2. Condition: Room terminal units - Heating Convectors: **Good**

   1.1.3. Construction Room terminal units – Air Terminals -1: *Existing* round supply air diffusers.
   1.1.4. Condition: Room terminal units - Air Terminals -1: **Good**

   1.1.5. Construction Room terminal units – Air Terminals -2: *New* supply air diffusers and return air grills.
   1.1.6. Condition: Room terminal units - Air Terminals -1: **New**

   1.2. Hot Water Heating Distribution System:
   1.2.1. Construction: The hot water heating distribution system includes black steel hot water supply and return piping and two (2) in-line centrifugal hot water pumps.
   1.2.2. Condition: **New**

   1.3. Central Boiler System:
   1.3.1. Construction: The hot water system consists of one (1) Buderus high-efficieny boiler, two (2) circulation pumps, copper circulation piping, expansion tank, black steel fuel piping, boiler mounted safety devices, dedicated combustion air and direct vent piping, and temperature controls. The boiler is fueled by natural gas and is sealed combustion type. The boiler, circulating pump, control system are new and are located in the basement mechanical equipment room (MER).

| Location | Boiler | Type | Fuel | Comb | Pumps | Type | XTank | CA | Control | Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| Basement M.E.R. | 1 | HW | NG | FD | 2 | ILC | 1 | Yes | DDC | New |

Note 1: Boiler safety devices and control testing not included in project scope.

Note 2: 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
FD = Forced Draft
NG = Natural Gas
XTank = Thermal Expansion Tank

   1.3.2. Condition: **New**

*Note: The field audit and PCA did not include functional testing of boiler safety devices, water heater safety devices, nor fire or smoke alarm systems.*

1.4. HVAC Distribution System:
1.4.1. Construction: The HVAC distribution system includes galvanized ductwork, supply trunks, and return air plenums.
1.4.2. Condition: **New**

1.5. Zoned HVAC System:
1.5.1. Construction: The HVAC system consists of Two (2) roof mounted Trane RTU's and Two (2) Trane AHU's with remote condensing units (ACCU). The units are constant air volume type (CAV).
1.5.2. Condition: **New**

1.6. Controls
1.6.1. Construction: The building control systems are new. The controls system consist of a TACO central hot water heating system controller, Honeywell wireless zone controller, Buderus boiler controller (packaged), room thermostats, and unit mounted Trane Roof-top-unit controls and economizers.
1.6.2. Condition: Controls - **New**

1.7. Performance Observations
1.7.1. Indoor Air Quality (IAQ): The basement Computer room/Class room-B07 has a small connection (4" x 6") to the HVAC supply air system. Fresh ventilation air supply into this room is negligible. This area may be experiencing poor Indoor Air Quality due to lack of fresh air/ventilation, high student loading, and computer heat generation.
1.7.2. Energy and Sustainability: High efficiency HVAC systems and controls resulting in minimum energy costs.

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: **New**

3. Conclusion:
3.1. The HVAC system as a whole is new and/or in good condition.

4. Estimates: Suggested remedies and opinions of probable Cost
4.1. De minimus conditions
4.1.1. Add safety covers for open relay contacts associated with TACO controller.
4.2. Short-Term Costs
4.2.1. Add thermostatic radiator and baseboard control valves $2,200
4.2.2. Add portable HEPA filter unit for room B07: $800

## 4.5.1.3 – HVAC: Roof

HVAC 1 – Packaged Roof-Top-Unit (RTU) -1

HVAC 2 – Air Cooled Condensing Unit (ACCU) - 1

HVAC 3 – Exhaust Louver

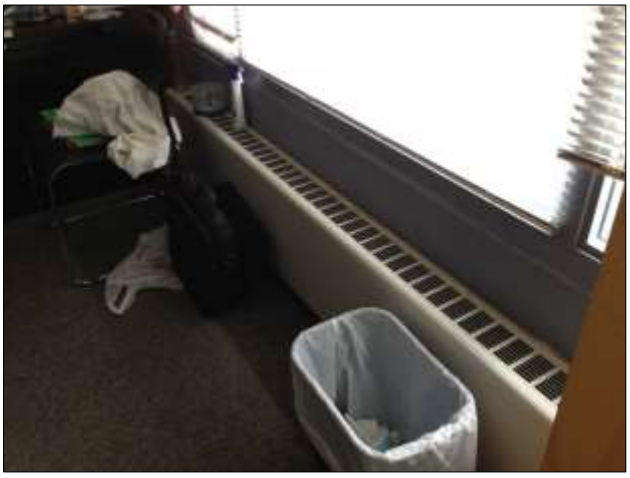
HVAC 4 – Air Cooled Condensing Unit (ACCU) - 2

HVAC 5 – Packaged Roof-Top-Unit (RTU) -2

## 4.5.1.4 – HVAC: 1st Floor

HVAC 6 – Office supply air diffuser (typical pre-existing)

HVAC 7 – Hot water heating radiator (typical)



HVAC 8 – Hot water heating baseboard (typical)

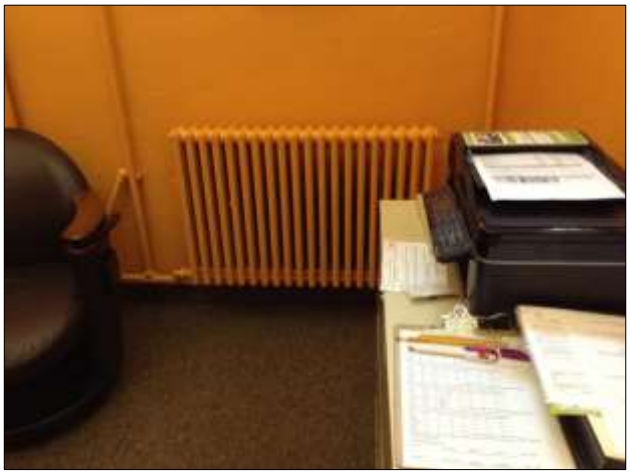
HVAC 9 – Community room supply air diffuser & return grills (new)

HVAC 10 – Center offices thermostat

HVAC 11 – Center offices air diffuser (new)

### 4.5.1.5 – HVAC: Basement

HVAC 12 – Supply duct manifold


HVAC 13 – Hot water heating radiator: Office


HVAC 14 – Hot water heating radiator


HVAC 15 – Office supply air diffuser


HVAC 16 – Storage room piping

HVAC 17 – Computer lab (limited supply air) B07

## 4.5.1.6 – HVAC: Central Air Handler, Boiler, HW System

HVAC 18 – Air Handing Unit (AHU)

HVAC 19 – Hot water heating boiler - 1


HVAC 20 – Hot water heating boiler - 2

HVAC 21 – Hot water heating boiler (leaking zone manifold)

HVAC 22 – Hot water heating pumping and piping manifold

HVAC 23 – Digital control systems

**Building Electrical Systems 4.5.2**

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**:** Efficient T8 lamps and magnetic ballasts.
   1.3. Condition Assessment: **New**

2. Power Distribution
   2.1. Construction and condition
      2.1.1. Distribution panels: Condition-**New**
      2.1.2. General Receptacles: Condition-**New**

3. Utilities Service
   3.1. Construction
      3.1.1. One (1) new electric service.
   3.2. Condition Assessment
      3.2.1. Condition Power Service: **New**
      3.2.2. Condition Electric Meter: **New**

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.
      5.1.2. Add occupancy sensors for basement classroom and support spaces: $1,300
   5.2. Short-Term Costs
      5.2.1. Add portable room filtration unit computer lab B07:

## 4.5.2.1 –Interior Lighting: 1st Floor

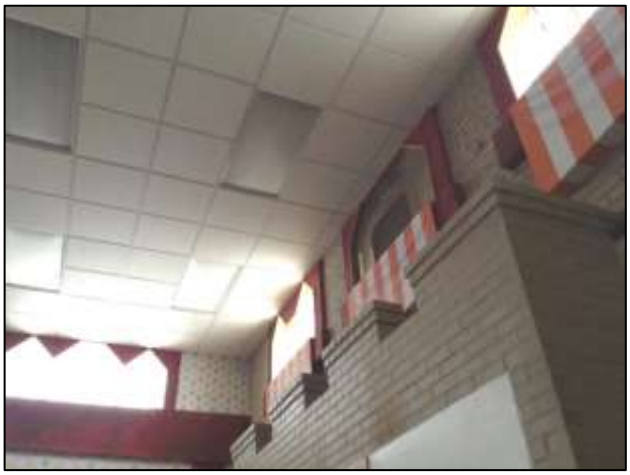
E1 – Hallway: Recessed fixtures

E2 – Office: Indirect fixtures

E3 – Center offices: Recessed fixtures (typical)

E4 – Office: Indirect fixtures

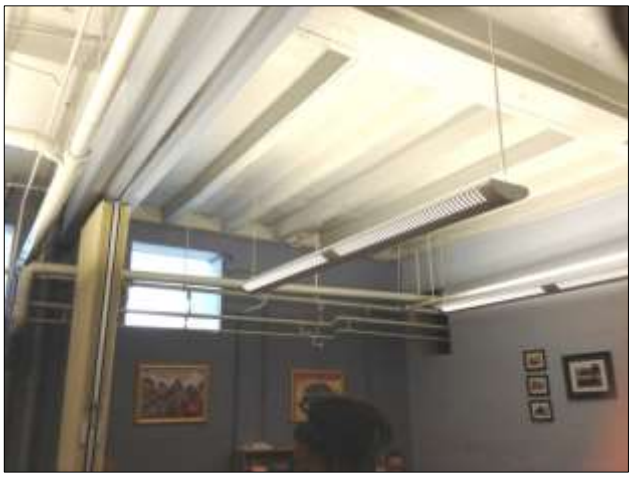
E5 – Center offices Hallway: Indirect fixtures



E6 – Community room: Recessed fixtures and natural lighting

## 4.5.2.2 –Interior Lighting: Basement

E7 – Hallway: Indirect fixtures



E8 – Training room B05: Indirect fixtures

E9 – Office area

E10 – Occupancy detector (typical)

E11 – Rest room fixture (typical)

E12 – AHU Hallway B11: Indirect fixture

## 4.5.2.3 – Electrical: Service, Distribution, and Receptacles

E13 – 1st Floor breaker panel - 1

E14 – 1st Floor breaker panel - 2

E15 – Basement power and breaker panels

E16 – Electrical conduit

**Building Plumbing Systems 4.5.3**

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 men's and ladies' rooms, lunch room/kitchen areas, and laundry.
   1.2. Construction
      1.2.1. Five (5) toilets
      1.2.2. Six (6) lavatory sinks
      1.2.3. One (1) urinal
      1.2.4. Two (1) SS kitchen sinks
      1.2.5. One (1) janitor's sink
      1.2.6. One (1) wash machine (laundry)
      1.2.7. One (1) laundry sink
   1.3. Condition Assessment
      1.3.1. Condition: **NEW**

2. Domestic Water Production
   2.1 Construction: The domestic water heating system is served by one Bradford-White (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 | 50 | NG | No | Yes | No | Yes | **No** | Unit | Installation Date: 1/28/91 |

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: **Poor**
2.1.2 Supply piping: **Good**

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

4. Conclusions:
   - 4.1 The plumbing system is a combination of new and existing components. The overall system is in good condition.

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.

## 4.5.2.1 – Plumbing: Fixtures (typical)

P1 – Women's room (typical)

P2 – Men's room

P3 – Water cooling (typical of 2)

P4 – Kitchen sink (typical of 2)

## 4.5.2.3 – Plumbing: Domestic water

P5 – Domestic Water heater

P6 – Domestic Water heater PRV and piping

P7 – Domestic Water heater control

P8 – Basement Laundry

P9 – Water service: meter and shut-off

**Building Fire Protection and Life Safety Systems 4.5.4**

1. Fire Extinguishers
   1.1. Construction: One (1) fire extinguisher present, one (1) missing.
   1.2. Condition Assessment: **Derelict**
      1.2.1.1. Physical Deficiencies: One (1) missing unit
      1.2.1.2. Maintenance observations: One (1) expired testing date

2. Alarm Systems
   2.1. Construction Smoke Alarm: Two (2) observed smoke alarms present, one per floor.
   2.2. Condition Assessment Smoke Alarm: **Fair**
   2.3. No observable fire pull-stations present. **Potential Code Violation.**

*Note: The field audit and PCA did not include functional testing of fire or smoke alarm systems.*

3. Smoke Evacuation System and Stairwell Pressurization
   3.1. No Smoke Evacuation System or Stairwell Pressurization.

4. Sprinklers and Standpipes
   4.1. No sprinkler system present.

5. Emergency Lighting
   5.1. Construction: Emergency lighting present at required exists and stairwells.
   5.2. Condition Assessment: **New**

6. Ground Fault Interruption
   6.1. GFI's not present in all kitchen connections. **Potential Code Violation.**

7. Conclusions:
   7.1. The building fire protection and life safety systems are in good condition.

8. Estimates: Suggested remedies and Opinions of probable cost
   8.1. De Minimus Conditions
      8.1.1. Test fire extinguisher at Community room entrance.
   8.2. Short-Term Costs
      8.2.1. Add a minimum of four (4) fire extinguishers
         8.2.1.1. 1st floor side exit (missing): $250
         8.2.1.2. 1st floor front office hallway: $250
         8.2.1.3. Outside Basement M.E.R.: $250
         8.2.1.4. Basement hallway: $250
      8.2.2. Add a minimum of five(5) smoke-fire detector/alarms:
         8.2.2.1. Community room: $350
         8.2.2.2. 1st floor class room: $350
         8.2.2.3. 1st floor front office hallway: $350
         8.2.2.4. 1st floor front center office hallway: $350
         8.2.2.5. Basement hallway: $350
      8.2.3. Add a minimum of one (1) GFI receptacle, first floor kitchen sink: $300

## 4.5.4.1 – Fire Protection: Extinguishers, Emergency Lighting, Detectors and Alarms, and Ground Fault Interruption

FP 1 – Extinguisher (testing out-of date)

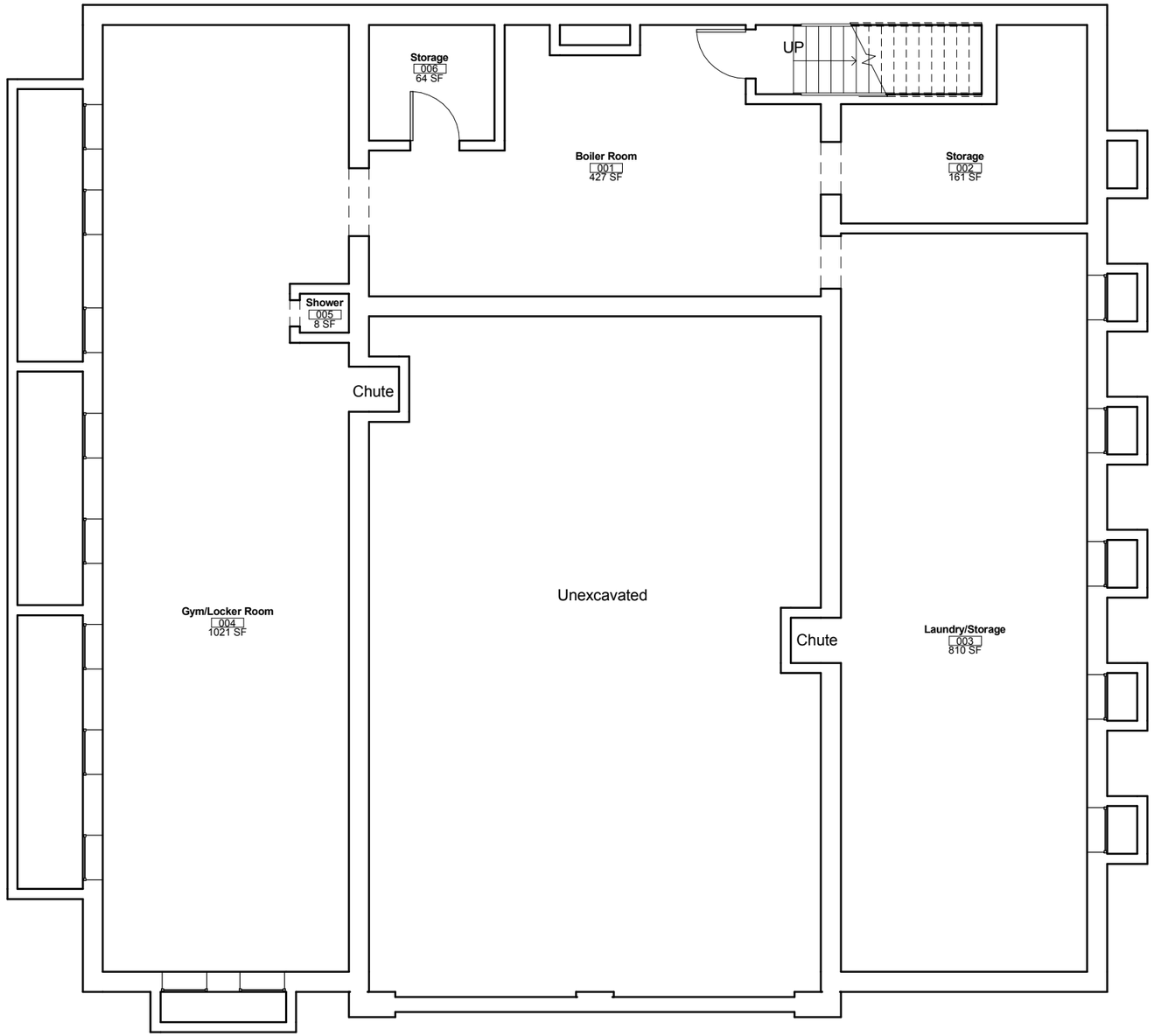
FP 2 – Basement classroom training area smoke detector B05


LS 1– First Floor emergency existing sign/light (typical)

LS 2– Emergency light (typical)


LS 3 – Basement emergency existing sign/light (typical)

LS 4 – Power receptacle




1 Basement Level
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

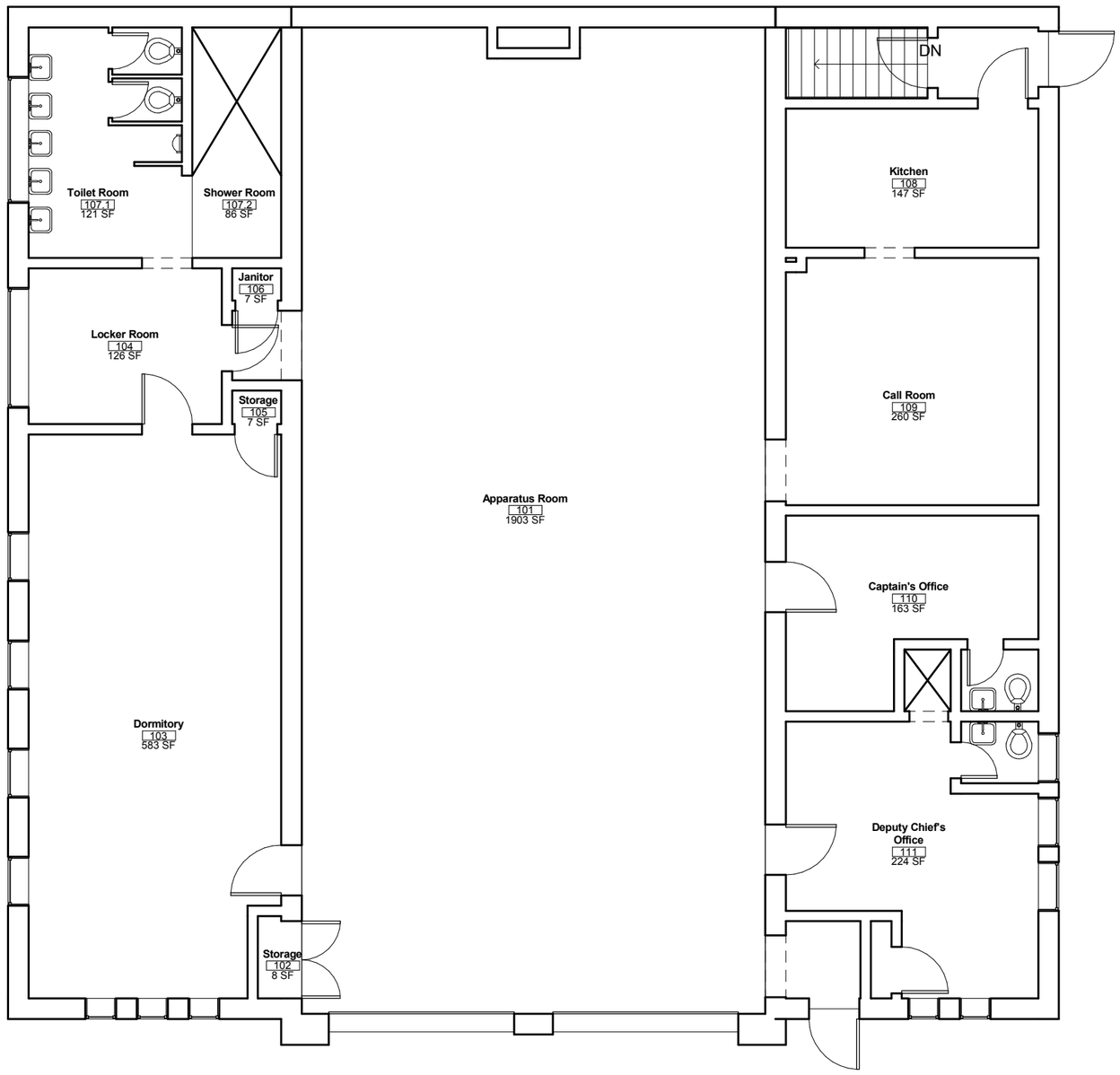
# Firehouse 14

City of Pittsburgh

## Basement Floor Plan

A1.00

| | |
|---|---|
| Date | 07/11/12 |
| Drawn by | AS |
| Scale | 1/8" = 1'-0" |




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

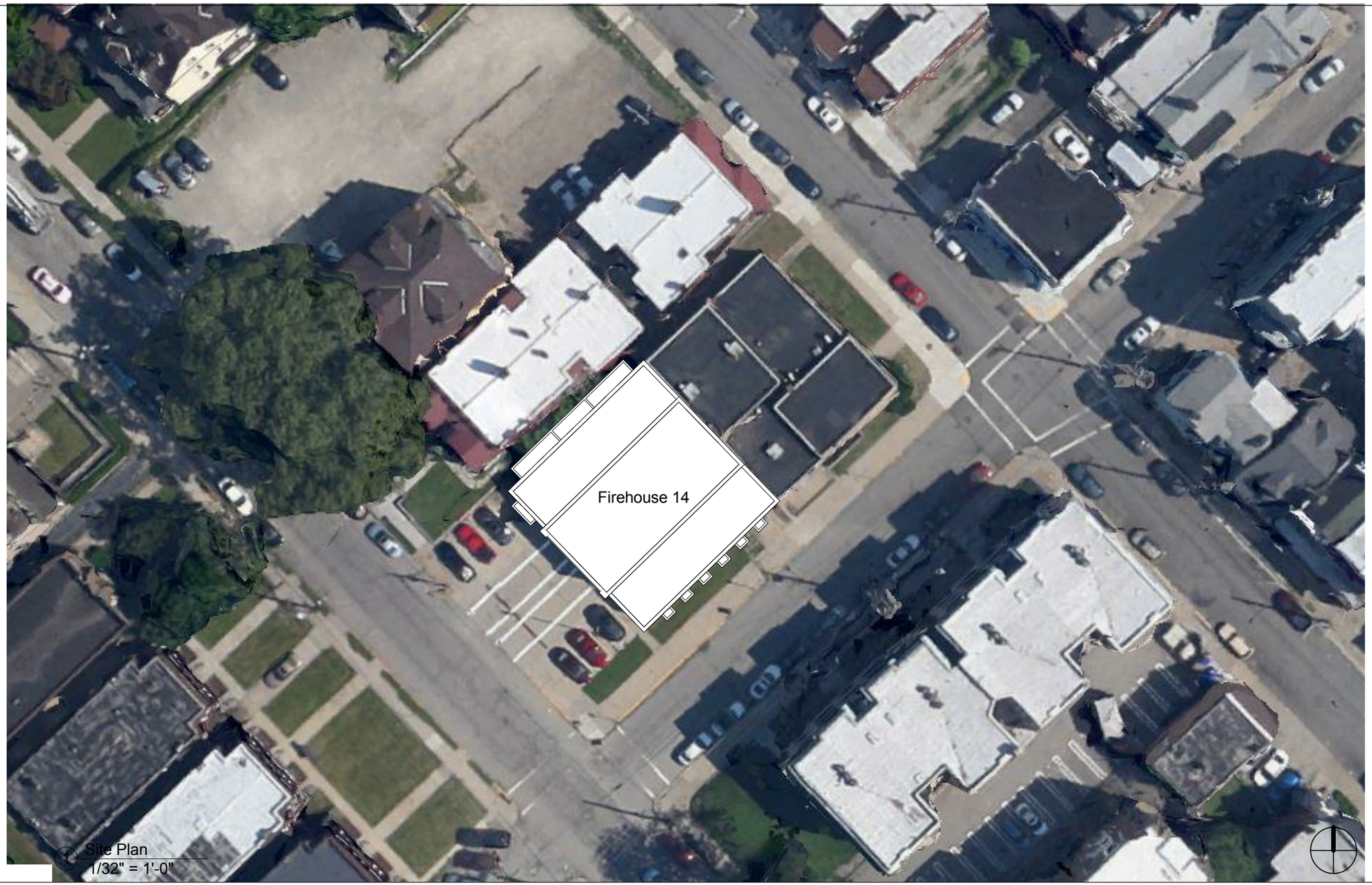
*The drawings and related digital files are a schematic rendition of the existing conditions of the facility only. Please verify exact field conditions before using these for further construction and renovation work.*

Massaro

# Firehouse 14

City of Pittsburgh

| L1 Floor Plan | | A1.10 |
|---|---|---|
| Date | 07/11/13 | |
| Drawn by | AS | Scale 1/8" = 1'-0" |




1 Site Plan
1/32" = 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 14

City of Pittsburgh

| Site Plan | | C1.01 |
|---|---|---|
| Date | 07/11/13 | |
| Drawn by | AS | Scale 1/32" = 1'-0" |

B110 - FIREHOUSE 14

## 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? | ☐ | ☑ | ☐ | |
| 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 14 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 | 13.2 | 3920 | - | $361 |
| February | 0 | 10.8 | 3640 | - | $329 |
| March | 0 | 11.6 | 3360 | - | $312 |
| April | 21 | 10.4 | 3240 | - | $297 |
| May | 94 | 14.4 | 3440 | - | $353 |
| June | 182 | 14.8 | 5800 | - | $538 |
| July | 397 | 18 | 6720 | - | $633 |
| August | 206 | 18 | 7880 | - | $724 |
| September | 78 | 18.4 | 6600 | - | $626 |
| October | 0 | 15.6 | 4600 | - | $453 |
| November | 0 | 14 | 3960 | - | $393 |
| December | 0 | 14 | 3280 | - | $341 |
| | | **Annual Totals** | **56,440** | **$0** | **$5,359** |

**2011 - Natural Gas**

YEAR: 2011

| Month | Heating Degree Days | MCF | Therms | Total Bill ($) |
|---|---|---|---|---|
| January | 1240 | 128.9 | 1289 | $1,285 |
| February | 917 | 57.7 | 577 | $577 |
| March | 781 | 56.8 | 568 | $576 |
| April | 350 | 20.3 | 203 | $219 |
| May | 138 | 9.5 | 95 | $112 |
| June | 12 | 6 | 60 | $83 |
| July | 0 | 6 | 60 | $83 |
| August | 1 | 7.1 | 71 | $92 |
| September | 87 | 10 | 100 | $121 |
| October | 401 | 37 | 370 | $383 |
| November | 532 | 16.5 | 165 | $175 |
| December | 849 | 123.3 | 1233 | $1,161 |
| | | **Annual Totals** | **4,791** | **$4,866** |

**2012 - Electricity**

YEAR: 2012

| Month | Cooling Degree Days | Billed Demand (kW) | Electric Use (kWh) | Demand Cost ($) | Total Bill ($) |
|---|---|---|---|---|---|
| January | 0 | 13.2 | 4000 | - | $391 |
| February | 0 | 10.8 | 3000 | - | $299 |
| March | 4 | 12.8 | 3040 | - | $314 |
| April | 7 | 13.2 | 3080 | - | $320 |
| May | 114 | 13.2 | 3800 | - | $376 |
| June | 181 | 26.8 | 7480 | - | $744 |
| July | 347 | 28.4 | 10280 | - | $985 |
| August | 226 | 32.8 | 10360 | - | $1,018 |
| September | 110 | 16.4 | 4840 | - | $484 |
| October | 24 | 8.8 | 2760 | - | $273 |
| November | 0 | 9.2 | 3000 | - | $294 |
| December | 0 | 9.2 | 2960 | - | $291 |
| | | **Annual Totals** | **58,600** | **$0** | **$5,789** |

**2012 - Natural Gas**

YEAR: 2012

| Month | Heating Degree Days | MCF | Therms | Total Bill ($) |
|---|---|---|---|---|
| January | 993 | 94.5 | 945 | $885 |
| February | 860 | 79.7 | 797 | $758 |
| March | 430 | 41.3 | 413 | $399 |
| April | 456 | 18.6 | 186 | $192 |
| May | 60 | 9.3 | 93 | $107 |
| June | 29 | 3.3 | 33 | $31 |
| July | 0 | 6 | 60 | $99 |
| August | 1 | 4.4 | 44 | $63 |
| September | 107 | 6.4 | 64 | $71 |
| October | 343 | 16.2 | 162 | $164 |
| November | 719 | 49.4 | 494 | $417 |
| December | 795 | 58.9 | 589 | $494 |
| | | **Annual Totals** | **3,880** | **$3,680** |

## 2013 - Electricity

YEAR: 2013

| Month | Cooling Degree Days | Billed Demand (kW) | Electric Use (kWh) | Demand Cost ($) | Total Bill ($) |
|---|---|---|---|---|---|
| January | 0 | 12.4 | 3200 | - | $330 |
| February | 0 | 11.2 | 2880 | - | $298 |
| March | 0 | 8.8 | 2720 | - | $274 |
| April | 22 | 8.4 | 2960 | - | $290 |
| May | 92 | 12 | 2920 | - | $305 |
| June | - | 16.4 | 4200 | - | 392.63 |
| July | - | - | - | - | - |
| August | - | - | - | - | - |
| September | - | - | - | - | - |
| October | - | - | - | - | - |
| November | - | - | - | - | - |
| December | - | - | - | - | - |
| | | **Annual Sub-Totals** | **18,880** | **$0** | **$1,891** |

## 2013 - Natural Gas

YEAR: 2013

| Month | Heating Degree Days | MCF | Therms | Total Bill ($) |
|---|---|---|---|---|
| January | 988 | 108.2 | 1082 | $896 |
| February | 998 | 54.7 | 547 | $460 |
| March | 911 | 70.8 | 708 | $591 |
| April | 360 | 37.4 | 374 | $120 |
| May | 151 | 12.3 | 123 | $49 |
| June | - | | - | $0 |
| July | - | - | - | - |
| August | - | - | - | - |
| September | - | - | - | - |
| October | - | - | - | - |
| November | - | - | - | - |
| December | - | - | - | - |
| | | **Annual Sub-Totals** | **2,834** | **$2,116** |

**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 | 58,760 | kWh | 3.412142 | 200,497 | $5,711.04 |
| Natural Gas | 4,419 | Therms | 100 | 441,917 | $4,126.23 |
| Purchased Steam | | | 0 | - | |
| Purchased Hot Water | | | 0 | - | |
| Purchased Chilled Water | | | 0 | - | |
| Oil #: | | | 0 | - | |
| Propane | | | 0 | - | |
| Coal | | | 0 | - | |
| Thermal—On-Site Generated | | | 0 | - | |
| Other | | | 0 | - | |
| Electricity—On-Site Generated | | | 0 | - | |
| Thermal or Electricity—Exported | | | 0 | - | |
| | | | 0 | - | |
| **Total** | | | | **642,414** | **$ 9,837.27** |

| | |
|---|---|
| **Gross Conditioned Area** | **3635.00** |
| **EUI (kBtu/ft^2)** | **176.73** |
| **Target Finder Score*** | **145** |
| **CBECS EUI (for comparable , kBtu/ft^2)** | **88.3** |
| **ECI ($/ft^2)** | **$ 1.87** |

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 (T12): **Poor**
- 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**

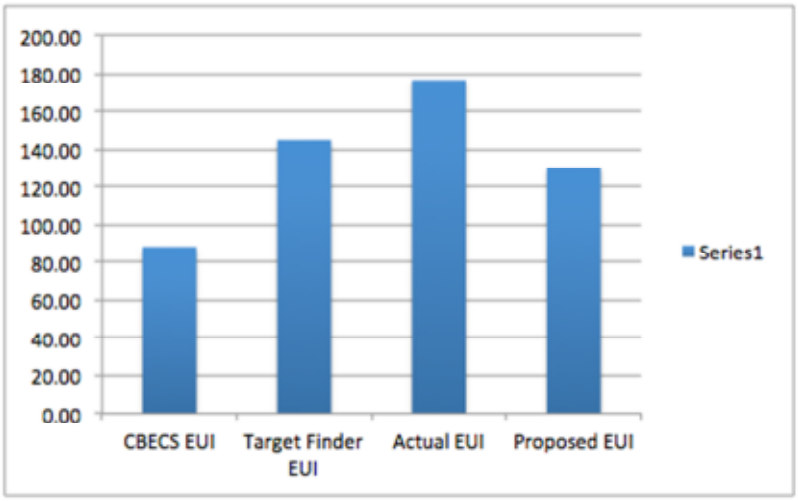
The EUI for Firehouse 14 is calculated at 176.73 kBtu/Ft2.

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 130 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 | 176.73 |
| Proposed EUI | 130.00 |



**Potential savings from achieving proposed EUI target**

| Energy Type | Total Annual Use | Units | Conversion Multiplier | kBtu | Total Annual Cost ($) |
|---|---|---|---|---|---|
| Electricity | 43,223 | kWh | 3.412142 | 147,483 | $4,200.96 |
| Natural Gas | 3,251 | therms | 100 | 325,067 | $3,035.19 |
| Purchased Steam | | | 0 | - | |
| Purchased Hot Water | | | 0 | - | |
| Purchased Chilled Water | | | 0 | - | |
| Oil #: | | | 0 | - | |
| Propane | | | 0 | - | |
| Coal | | | 0 | - | |
| Thermal—On-Site Generated | | | 0 | - | |
| Other | | | 0 | - | |
| Electricity—On-Site Generated | | | 0 | - | |
| Thermal or Electricity—Exported | | | 0 | - | |
| | | | | - | |
| **Total** | | | | **472,550** | **$ 7,236.15** |

| | |
|---|---|
| **Gross Conditioned Area*** | **3635.00** |
| **Actual EUI (kBtu/ft^2)** | **176.73** |
| **Proposed EUI (kBtu/ft^2)** | **130.00** |
| **Proposed ECI ($/ft^2)** | **$ 1.99** |

*Gross Conditioned Area excludes basement level.

**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 and return piping
- Insulate basement level domestic water piping
- Re-lamp using T8