DISPLAY THIS CARD ON PRINCIPAL FRONTAGE OF WORK

CITY OF PORTLAND

BUILDING PERMIT

This is to certify that CITY OF PORTLAND

Located At 124 CONGRESS ST

Job ID: 2012-05-3929-ALTCOMM

CBL: 016- G-001-001

has permission to Structurally modify the f Fire Station for installation of a new monopole antenna; separate permit required **provided that the person or persons, firm or corporation accepting this permit shall comply with all of the provisions of the Statues of Maine and of the Ordinances of the City of Portland regulating the construction, maintenance and use of the buildings and structures, and of the application on file in the department.**

Notification of inspection and written permission procured before this building or part thereof is lathed or otherwise closed-in. 48 HOUR NOTICE IS REQUIRED.	A final inspection must be completed by owner before this building or part thereof is occupied. If a certificate of occupancy is required, it must be

5/3/12

Fire Prevention Officer **Code Enforcement Officer / Plan Reviewer**

THIS CARD MUST BE POSTED ON THE STREET SIDE OF THE PROPERTY
PENALTY FOR REMOVING THIS CARD

City of Portland, Maine - Building or Use Permit Application

389 Congress Street, 04101 Tel: (207) 874-8703, FAX: (207) 8716

Job No:	Date Applied:	CBL:
2012-05-3929-ALTCOMM	**5/4/2012**	**316- G-001-001**

Location of Construction:	Owner Name:	Owner Address:	Phone:
124 CONGRESS ST – Munjoy Hill Fire Station	**CITY OF PORTLAND**	**389 CONGRESS ST** **PORTLAND, ME 04101**	
Business Name:	Contractor Name: **Scott Construction Corp**	Contractor Address: **108 Rockaway RD., Falmouth ME 04105**	Phone: **(207) 632-0521**
Lessee/Buyer's Name:	Phone:	Permit Type: **BLDG - Building**	Zone: **R-6**
Past Use: Fire Station	Proposed Use: Same – Fire Station – ~~replace monopole &~~ support structure modifications for Monopole replacement	Cost of Work:	CEO District:
		Fire Dept: 5/15/12 ! Approved w/ conditions ___ Denied ___ N/A Signature: BJ Condon (58)	Inspection: Use Group: R-2/S-2 Type: B IBC-2009 Signature: JMB 5/31/12
Proposed Project Description: **Fire Station Monopole replace; support modif.**		Pedestrian Activities District (P.A.D.)	
Permit Taken By: **Brad**			

1. This permit application does not preclude the Applicant(s) from meeting applicable State and Federal Rules.
2. Building Permits do not include plumbing, septic or electrial work.
3. Building permits are void if work is not started within six (6) months of the date of issuance. False informatin may invalidate a building permit and stop all work.

Zoning Approval

Special Zone or Reviews	Zoning Appeal	Historic Preservation
___ Shoreland	___ Variance	✓ Not in Dist or Landmark
___ Wetlands	___ Miscellaneous	___ Does not Require Review
___ Flood Zone	___ Conditional Use	___ Requires Review
___ Subdivision	___ Interpretation	___ Approved
___ Site Plan	___ Approved	___ Approved w/Conditions
___ Maj ___ Min ___ MM	___ Denied	___ Denied
Date: OK 5/15/12 AFM	Date:	Date: AFM

CERTIFICATION

I hereby certify that I am the owner of record of the named property, or that the proposed work is authorized by the owner of record and that I have been authorized by the owner to make this application as his authorized agent and I agree to conform to all applicable laws of this jurisdiction. In addition, if a permit for work described in the appication is issued, I certify that the code official's authorized representative shall have the authority to enter all areas covered by such permit at any reasonable hour to enforce the provision of the code(s) applicable to such permit.

SIGNATURE OF APPLICANT ADDRESS DATE PHONE

RESPONSIBLE PERSON IN CHARGE OF WORK, TITLE DATE PHONE

6-6-12 Dan Mark 415-3425 Rebar 2 walls in garage OK - SI on site
Will provide revised plan to 9'6" from 10' rear wall

6-13-12 Dan Mark Rebar 3rd wall OK pending SI report

BUILDING PERMIT INSPECTION PROCEDURES

Please call 874-8703 or 874-8693 (ONLY)

or email: buildinginspections@portlandmaine.gov

With the issuance of this permit, the owner, builder or their designee is required to provide adequate notice to the city of Portland Inspections Services for the following inspections. Appointments must be requested 48 to 72 hours in advance of the required inspection. The inspection date will need to be confirmed by this office.

- **Please read the conditions of approval that is attached to this permit!! Contact this office if you have any questions.**
- **Permits expire in 6 months. If the project is not started or ceases for 6 months.**
- **If the inspection requirements are not followed as stated below additional fees may be incurred due to the issuance of a "Stop Work Order" and subsequent release to continue.**

Periodic Footings/Rebar/Shotcrete walls prior to pouring concrete

Close In Elec/Plmb/Frame prior to insulate or gyp

Final Inspection

The project cannot move to the next phase prior to the required inspection and approval to continue, REGARDLESS OF THE NOTICE OF CIRCUMSTANCES.

IF THE PERMIT REQUIRES A CERTIFICATE OF OCCUPANCY, IT MUST BE PAID FOR AND ISSUED TO THE OWNER OR DESIGNEE BEFORE THE SPACE MAY BE OCCUPIED.

Job ID: 2012-05-3929-ALTCOMM **Located At:** 124 CONGRESS ST **CBL:** 016- G-001-001

Conditions of Approval:

Fire

1. All construction shall comply with City Code Chapter 10.
2. The fire alarm shall be reviewed by a licensed contractor(s) for code compliance. Compliance letters are required.
3. A separate Fire Alarm Permit is required for new systems; or for work effecting more than 5 fire alarm devices; or replacement of a fire alarm panel with a different model. This review does not include approval of fire alarm system design or installation.
4. The fire alarm system shall comply with the City of Portland Standard for Signaling Systems for the Protection of Life and Property. All fire alarm installation and servicing companies shall have a Certificate of Fitness from the Fire Department.
5. All means of egress to remain accessible at all times.
6. Any cutting and welding done will require a Hot Work Permit from Fire Department.
7. Walls in structure are to be labeled according to fire resistance rating. IE; 1 hr. / 2 hr. / smoke proof.
8. A single source supplier should be used for all through penetrations.

Building

1. Application approval based upon information provided by applicant. Any deviation from approved plans requires separate review and approval prior to work.
2. This permit does not approve the erection of the monopole antenna; this will require a separate permit application for approval from this office.
3. All penetrations through rated assemblies must be protected by an approved firestop system installed in accordance with ASTM E 814 or UL 1479, per IBC 2009 Section 713.
4. Separate permits are required for any electrical, plumbing, sprinkler, fire alarm, HVAC systems, heating appliances, including pellet/wood stoves, commercial hood exhaust systems and fuel tanks. Separate plans may need to be submitted for approval as a part of this process.
5. The final report of Special Inspections shall be submitted prior to the final inspection or the issuance of the Certificate of Occupancy.

R-6

Entered 5/4/12 (BP)

General Building Permit Application

If you or the property owner owes real estate or personal property taxes or user charges on any property within the City, payment arrangements must be made before permits of any kind are accepted.

2012-05-3929-ALTCOMM

Location/Address of Construction: 124 CONGRESS STREET		
Total Square Footage of Proposed Structure/Area: EXISTING BUILDING ~~+1,976 SF~~ 14,832	Square Footage of Lot: 15,987 SF	
Tax Assessor's Chart, Block & Lot Chart# 016 Block# G001 Lot# 001	Applicant *must be owner, Lessee or Buyer* Name CITY OF PORTLAND Address 389 CONGRESS ST City, State & Zip PORTLAND, ME 04101	Telephone: 874-8400 874-8486
Lessee/DBA (If Applicable)	Owner (if different from Applicant) Name Address City, State & Zip	Cost Of Work: $ 243,850.00 C of O Fee: $ Total Fee: $

Current legal use (i.e. single family) FIRE STATION

If vacant, what was the previous use?

Proposed Specific use: NO CHANGE

Is property part of a subdivision? NO If yes, please name

Project description: MUNJOY HILL FIRE STATION MONOPOLE REPLACEMENT SUPPORT STRUCTURE MODIFICATIONS

Contractor's name: SCOT CONSTRUCTION CORP

Address: 108 ROCKAWAY RD

City, State & Zip FALMOUTH, ME 04105 Telephone: 207-632-0521

Who should we contact when the permit is ready: GREG SCOTT Telephone: SAME

Mailing address: SAME

Please submit all of the information outlined on the applicable Checklist. Failure to do so will result in the automatic denial of your permit.

RECEIVED
MAY 04 2012
Dept. of Building Inspections
City of Portland Maine

In order to be sure the City fully understands the full scope of the project, the Planning and Development Department may request additional information prior to the issuance of a permit. For further information or to download copies of this form and other applications visit the Inspections Division on-line at www.portlandmaine.gov, or stop by the Inspections Division office, room 315 City Hall or call 874-8703.

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

Signature: Date: 5-3-12

This is not a permit; you may not commence ANY work until the permit is issue

Gayle Guertin - Re: 124 Congress Munjoy Hill Fire Station CBL 016-G001

From: Tammy Munson
To: Dobson, Lannie
Date: 5/2/2012 3:45 PM
Subject: Re: 124 Congress Munjoy Hill Fire Station CBL 016-G001
CC: Guertin, Gayle; Saucier, Brad

yes, the fee is waived.

>>> Lannie Dobson 5/2/2012 3:43 PM >>>
Yes, The owner is City of Portland

>>> Tammy Munson 5/2/2012 3:19 PM >>>
Does it show the owner as the City of Portland?

>>> Lannie Dobson 5/2/2012 2:32 PM >>>
Will the fee's be waived for the Munjoy Hill Fire Station? Thank you, Lannie Dobson

SCOTT
CONSTRUCTION CORPORATION
EXPERIENCE INNOVATION INTEGRITY
108 ROCKAWAY ROAD, FALMOUTH, ME 04105
Phone: (207) 632-0521 email: gscott207@gmail.com

Fire Department Requirements for the

Munjoy Hill Fire Station Monopole Replacement

Applicant:

Scott Construction Corporation for
City of Portland
389 Congress St
Portland, ME 04101
Contact: Greg Scott 632-0521

Project Engineer:

Becker Structural Engineers
75 York Street
Portland, ME 04101
Contact: Bryson Welch 879-1838

1. No change in use of structure
2. No change in square footage, existing total 14,832 SF
3. No change or modifications in fire protection system
4. See plans for relocations of fire alarms and pull boxes (approximately 3 EA 1'-0" from existing location.
5. No changes to Life Safety Plan
6. No changes to elevators

Certificate of Design Application

From Designer: BECKER STRUCTURAL ENGINEERS

Date: 5/3/12

Job Name: PFD MUNJOY HILL FIRE STATION MONO-POLE INSTALLATION, PORTLAND, ME, DATED 3/9/12

Address of Construction: 134 CONGRESS STREET

~~2003~~ 2009 International Building Code

Construction project was designed to the building code criteria listed below:

Building Code & Year ~~2003~~ 2009 Use Group Classification (s) N/A

Type of Construction COMMUNICATIONS POLE SUPPORT STRUCTURE OVER ROOF

Will the Structure have a Fire suppression system in Accordance with Section 903.3.1 of the 2003 IRC N/A

Is the Structure mixed use? N/A If yes, separated or non separated or non separated (section 302.3) N/A

Supervisory alarm System? N/A Geotechnical/Soils report required? (See Section 1802.2) N/A

Structural Design Calculations

COMPLETED Submitted for all structural members (106.1 – 106.11)

Design Loads on Construction Documents (1603)

Uniformly distributed floor live loads (7603.11, 1807)

Floor Area Use	Loads Shown
N/A	

Wind loads (1603.1.4, 1609)

- N/A Design option utilized (1609.1.1, 1609.6)
- Basic wind speed (1809.3)
- Building category and wind importance Factor, I_w table 1604.5, 1609.5)
- Wind exposure category (1609.4)
- Internal pressure coefficient (ASCE 7)
- Component and cladding pressures (1609.1.1, 1609.6.2.2)
- Main force wind pressures (7603.1.1, 1609.6.2.1)

Earth design data (1603.1.5, 1614-1623)

- N/A Design option utilized (1614.1)
- Seismic use group ("Category")
- Spectral response coefficients, SDs & SD1 (1615.1)
- Site class (1615.1.5)

- N/A Live load reduction
- Roof *live* loads (1603.1.2, 1607.11)
- Roof snow loads (1603.7.3, 1608)
- Ground snow load, P_g (1608.2)
- If P_g > 10 psf, flat-roof snow load P_f
- If P_g > 10 psf, snow exposure factor, C_e
- If P_g > 10 psf, snow load importance factor, I_s
- Roof thermal factor, C_t (1608.4)
- Sloped roof snowload, P_s (1608.4)
- Seismic design category (1616.3)
- Basic seismic force resisting system (1617.6.2)
- Response modification coefficient, R_I and deflection amplification factor C_d (1617.6.2)
- Analysis procedure (1616.6, 1617.5)
- Design base shear (1617.4, 16175.5.1)

Flood loads (1803.1.6, 1612)

- N/A Flood Hazard area (1612.3)
- N/A Elevation of structure

Other loads

- SEE BELOW Concentrated loads (1607.4)
- N/A Partition loads (1607.5)
- N/A Misc. loads (Table 1607.8, 1607.6.1, 1607.7, 1607.12, 1607.13, 1610, 1611, 2404

NOTE:

DESIGN LOADS FOR THE MONO-POLE SUPPORT STRUCTURE WAS PROVIDED BY SABRE TOWER & POLES. PROPOSAL NUMBER: 12-6917-RAM DATED 2/24/12

Certificate of Design

Date: 5/3/12

From: BRYSON T. WELCH
(BEAVER STRUCTURAL ENGINEER)

These plans and / or specifications covering construction work on:

PFD MUNJOY HILL FIRESTATION MONO-POLE INSTALLATION, PORTLAND, MAINE, DATED 03/19/12

Have been designed and drawn up by the undersigned, a Maine registered Architect / Engineer according to the ***2003 International Building Code*** and local amendments 2009 FOR STRUCTURAL REQUIREMENTS.

STATE OF MAINE
BRYSON T WELCH
No. 11799
LICENSED
PROFESSIONAL ENGINEER
(SEAL)

Signature: [signature]

Title: STRUCTURAL ENGINEER

Firm: BEAVER STRUCTURAL ENGINEER

Address: 75 YORK STREET
PORTLAND ME 04101

Phone: 207-879-1838

For more information or to download this form and other permit applications visit the Inspections Division on our website at www.portlandmaine.gov

c. All welds deemed unacceptable shall be repaired and retested at the Contractor's expense.

D. Inspector shall verify that all ferrules are removed when applicable and that metal deck is free of debris prior to concrete placement.

E. Testing and inspection reports shall be submitted to the Owner, Architect and Engineer within 48 hours of completion of each test or inspection.

F. Nonconforming Work: Contractor shall be responsible for correcting deficiencies in structural steel work which inspections laboratory test reports have indicated to be not in compliance with requirements. Additional tests and/or surveys shall be performed, at the Contractor's expense, as may be necessary to show compliance of corrected work. Any costs associated with the Engineer's review and disposition of faulty works shall be borne by the Contractor.

END OF SECTION

sampling connection bolts to determine if they have been tightened to the snug tight condition. The test sample shall consist of 10% of the bolts in the connection, but not less than two bolts, selected at random. If more than 10% of the tested bolts fail the initial inspection, the engineer reserves the right to increase the number of bolts tested.

3. Slip Critical Bolted Connections:

    a. The inspector shall monitor the calibration of torquing equipment and the installation of bolts to determine that all plies of connected material have been drawn together and that the selected procedure is used to tighten all bolts.

    b. If the inspector does not monitor the calibration or installation procedures, he shall test all bolts in the affected connection using a manual torque wrench to assure that the required pretension has been reached.

4. Field Welded Connections: inspect and test during fabrication of structural steel assemblies, and during erection of structural steel all welded connections in accordance with procedures outline in AWS D1.1. Record types and location of defects found in work. Record work required and performed to correct deficiencies.

    a. Certify welders and conduct inspections and tests as required. Submit welder certifications to Engineer of Record. Perform visual inspection of all welds. Primary and secondary welds, including fillet welds, full penetration welds, and deck puddle welds, applied in the field and/or shop, shall be visually inspected.

    b. Welds deemed questionable by visual inspection shall receive non-destructive testing. In addition, all partial and full penetration welds, and any other welds indicated on the drawings are to receive non-destructive testing. Non-destructive testing methods include the following:

        1. Radiographic Inspection (RT): ASTM E 94 and ASTM E 142; minimum quality level "2-2T".

        2. Ultrasonic Inspection (UT): ASTM E 164.

        3. Magnetic Particle (MT) inspection procedures may be utilized at the inspectors discretion in addition to RT or UT inspection. MT procedures shall not replace RT or UT procedures without permission from the Structural Engineer.

O. Welding electrodes, welding process, minimum preheat and interpass temperatures shall be in accordance with AISC and AWS specifications. Any structural steel damaged in welding shall be replaced.

3.02 QUALITY CONTROL:

A. General: Contractor is responsible for maintaining quality control in the field and for providing a structure that is in strict compliance with the Contract Documents.

1. Required inspection and testing services are intended to assist the Contractor in complying with the Contract Documents. These specified services, however, do not relieve the Contractor of his responsibility for compliance, nor are they intended to limit the Contractor's quality control efforts in the field.

B. Testing: Owner shall engage an Independent Testing Agency to inspect all high-strength bolted and welded connections, to perform tests and prepare reports of their findings. All connections must pass these inspections prior to the installation of subsequent work which they support.

1. Testing agency shall conduct tests and state in each report which specific connections were examined or tested, whether the connections comply with requirements, and specifically state any deviations therefrom.

2. Contractor shall provide access for testing agency to places where structural steel work is being fabricated, produced or erected so that required inspection and testing can be accomplished. Testing agency may inspect structural steel at plant before shipment. The Engineer, however, reserves the right, at any time before final acceptance, to reject material not complying with specified requirements.

C. Inspection Requirements (to be performed by the Independent Testing Agency):

1. Bolted Connections: Inspect all bolted connections in accordance with procedures outlined in the AISC "Specification for Structural Joints using ASTM A325 or A490 Bolts.

2. Snug Tight Bolted Connections:

a. The inspector shall monitor the installation of bolts to determine that all plies of connected material have been drawn together and that the selected procedure is used to tighten all bolts.

b. If the inspector does not monitor the installation of bolts, he shall visually inspect the connection to determine that all plies of connected material have been drawn together and conduct tests on a

4. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.

5. Splice members only where indicated and accepted on shop drawings.

6. Do not enlarge unfair holes in members by burning or by use of drift pins, except in secondary bracing members. Ream holes that must be enlarged to admit bolts.

J. Erection bolts: Remove erection bolts. On exposed welded construction and fill holes with plug welds and grind smooth at exposed surface.

K. Gas Cutting: Do not use gas cutting torches in field for correcting fabrication errors in primary structural framing. Cutting will be permitted only on secondary members which are not under stress, as accepted by the Engineer of Record. Finish gas-cut sections equal to a sheared appearance when permitted.

L. Coating Damage: Touch up shop applied paint whenever damaged or bare. See "Coatings" sections for additional requirements.

M. Field Cut Beam Web Penetrations:

1. Field cut beam web penetrations are not permitted without written approval from the Structural Engineer.

2. Gas cutting torches are not permissible for cutting beam web penetrations without written approval from the Structural Engineer.

3. Beams with field cut beam web penetrations may require reinforcement, subject to the evaluation by the Structural Engineer.

4. The evaluation of field cut web penetrations by the Structural Engineers for Design-Build Subcontractors, including but not by limitation, Mechanical, Electrical, Plumbing and Sprinkler Subcontractors shall be compensated by the General Contractor or Design-Build Subcontractor.

5. The cost of executing field cut web penetrations and the associated beam reinforcement for Design-Build Subcontractors, including but not by limitation, Mechanical, Electrical, Plumbing and Sprinkler Subcontractors shall be paid for by the General Contractor or Design-Build Subcontractor.

6. Field cut beam web penetrations may not be permitted in certain locations, subject to the evaluation by the Structural Engineer.

N. Welders shall have current evidence of passing and maintaining the AWS D1.1 Qualifications test available in the field.

1. Tighten anchor bolts after supported members have been positioned and plumbed. Do not remove wedges or shims, but if protruding, cut off flush with edge of base or bearing plate prior to packing with grout.

2. Welding to anchor bolts for corrective measures is strictly prohibited without prior written approval from the Engineer.

F. Setting Plates and Base Plates:

1. Furnish templates and other devices as necessary for presetting bolts and other anchors to accurate locations. Refer to division 3 of the project Specifications for anchor bolt installation requirements in concrete.

2. Clean concrete bearing surfaces of bond-reducing materials. Clean bottom surface of setting and bearing plates.

3. Set loose and attached base plates for structural members on wedges or other adjusting devices.

4. Pack non-shrink grout solidly between bearing surfaces and bases or plates to ensure that no voids remain. Finish exposed surfaces, protect installed materials, and allow to cure. For proprietary grout materials, comply with manufacturer's instructions.

G. Concrete slabs that are part of elevated floors framing systems shall achieve 28-day design strength prior to the application of any superimposed loads such as curtain walls, masonry veneer, mechanical equipment and stairs. Additional testing beyond that specified in division 3 required to verify the concrete strength prior to application of superimposed loads shall be done at the Contractor's expense.

H. When installing expansion bolts or adhesive anchors, the contractor shall take measures to avoid drilling or cutting any existing reinforcement or damaging adjacent concrete. Holes shall be blown clean with compressed air and/or cleaned per manufacturer's recommendations prior to the installation of anchors.

I. Field Assembly:

1. Set structural frames accurately to lines and elevations indicated.

2. Align, adjust, level and plumb members of complete frame in to the tolerances indicated in the AISC Code of Standard Practice and in accordance with OSHA regulations.

3. Clean bearing surfaces and other surfaces which will be in permanent contact before assembly.

G. Brick masonry loose lintels and relieving angle assemblies, including fasteners, shall be hot dipped galvanized, unless noted otherwise on the Architectural Drawings

H. Unheated structural steel to be enclosed with architectural finishes, including but not by limitation, canopy members and/or roof pop-up members shall be primed with rust inhibitive alkyd primer, Tnemec Series 10 unless noted otherwise. Follow manufacturer's instructions for surface preparation and application. Substitution shall be equal to the above specified products, and shall be submitted for review.

I. Field Touch-up: Touch-up all paint and galvanizing damage, including but not by limitation, damage caused during shipping, erection, construction damage, and field welded steel.

PART 3 EXECUTION

3.01 ERECTION:

A. General: Comply with AISC Specifications for bearing, adequacy of temporary connections, alignment, and removal of paint on surfaces adjacent to field welds.

B. Erection Procedures: Comply with "Code of Federal Regulations, Part 1926" per the Occupational Safety and Health Administration (OSHA), Department of Labor (Latest Revision).

C. Surveys: Employ a Registered Land Surveyor to verify elevations of concrete bearing surfaces, and locations of anchor bolts and similar devices, before erection work proceeds, and report discrepancies to Architect and Structural Engineer. Do not proceed with erection until corrections have been made, or until compensating adjustments to structural steel work have been approved by Structural Engineer of Record. Additional surveys required to verify out-of-alignment work and/or corrective work shall be performed at the contractor's expense.

D. Temporary Shoring and Bracing: This is the sole responsibility of the Contractor. Provide temporary shoring and bracing members with connections of sufficient strength to support imposed loads. Remove temporary members and connections when all permanent members are in place, and all final connections are made, including the floor and roof diaphragms. Provide temporary guy lines to achieve proper alignment of structures as erection proceeds. Comply with OSHA Standard referenced previous. Retain the services of a Specialty Structural Engineer (Not the Engineer of Record) to design specialty shoring and bracing.

E. Anchor Bolts: Furnish anchor bolts and other connectors required for securing structural steel to foundations and other in-place work.

A 490 Bolts". Unless otherwise indicated, all bolted connections are to be tightened to the snug tight condition as defined by AISC.

D. Welded Construction: Comply with AWS Codes for procedures, appearance and quality of welds, and methods used in correcting welding work.

E. Holes for Other Work: Provide holes required for securing other work to structural steel framing, and for passage of other work through steel framing members, as shown on final shop drawings.

F. Cut, drill, or punch holes perpendicular to metal surfaces. Do not flame cut holes or enlarge holes by burning. Drill holes in bearing plates.

G. Fabricator, Erector and General Contractor shall coordinate safety requirements for the project, in accordance with OSHA Part 1926. Provide all necessary pieces and fabrications as required to safely erect and access the structure for the duration of project construction.

H. Camber, if any, is indicated on the drawings. Camber indicated is the required camber at time of erection. Contractor shall survey camber prior to placing metal deck.

2.03 STRUCTURAL STEEL COATINGS

A. To the greatest extent possible, structural steel coatings shall be shop applied.

B. Galvanizing, priming and painting for structural steel permanently exposed to view shall meet the requirements of Section 10 of the Code of Standard Practice, "Architecturally Exposed Structural Steel".

C. Provide venting/drainage holes in closed tubular members to be hot-dipped galvanized. Holes shall be provided in a location hidden from view in the final condition and in a manner that will not reduce the strength of the member. Hole locations shall be clearly indicated on the Shop Drawings and are subject to review by the Architect.

D. Follow manufacturer's installation and safety instructions when applying coatings. Adhere to recoat time recommendations set forth by manufacturer.

E. General: Shop priming of structural steel is not required for heated, interior steel not exposed to view unless noted otherwise.

F. Coatings: All exterior steel and/or steel permanently exposed to view shall receive a coating.

H. Electrodes for Welding:

1. Minimum 70 ksi electrodes. Filler material shall meet the grouping requirements per AWS D1.1 Table 3.1 for matching strength of connected materials.

2. All filler metal used welding shall meet the following Charpy V-Notch (CVN) requirements.

a. 20 ft-lb at 0 degrees Fahrenheit unless noted otherwise.

b. 20 ft-lb at -20 degrees Fahrenheit and 40 ft-lb at 70 degrees Fahrenheit at all complete joint penetration (CJP) groove welds.

I. Structural Steel Coatings shall be as specified in the Structural Steel Coatings section of this specification.

J. Non Shrink Cement-Based Grout: See Section 03310

K. Drilled Anchors: Expansion and adhesive by HILTI as indicated on the drawings.

2.02 FABRICATION:

A. Shop Fabrication and Assembly: Fabricate and assemble structural assemblies in shop to greatest extent possible. Fabricate items of structural steel in accordance with AISC Specifications and as indicated on final shop drawings.

1. Properly mark and match-mark materials for field assembly. Fabricate for delivery sequence which will expedite erection and minimize field handling of materials.

2. Where finishing is required, complete assembly, including welding of units, before start of finishing operations. Provide finish surfaces of members exposed in final structure free of markings, burrs and other defects.

B. Connections: Weld or bolt shop connections, as indicated.

1. Provide field bolted connections, except where welded connections or other connections are indicated.

2. Provide high-strength threaded fasteners for principal bolted connections, except where unfinished bolts are indicated.

C. High-Strength Bolted Connection: Install high-strength threaded fasteners in accordance with AISC "Specification for Structural Joints using ASTM A 325 or

PART 2 PRODUCTS

2.01 MATERIALS:

A. Structural Steel Shapes, Plates and Bars (U.N.O): ASTM A 36 minimum, higher strength steel is acceptable.

B. Structural Steel Hot Rolled Wide Flange Shapes: ASTM A 992 Grade 50 (ASTM A572 Grade 50 with special requirements per AISC Technical Bulletin #3, dated March 1997)

C. Steel Tube: ASTM A 500, Grade B, Fy = 46 ksi.

D. Steel Pipe: ASTM A 53, Grade B.

E. Anchor Bolts: ASTM F1554, Grade 36 weldable steel, unless noted otherwise on drawings. Anchor rods that are to be exposed to weather, located in unheated enclosures, or in contact with pressure treated lumber shall be hot dipped galvanized. All anchor bolts shall be headed or double nutted. "J" or "L" type anchor bolts are not permitted. Unless otherwise noted, specified embedment it to top face of head or nut.

F. Unfinished Threaded Fasteners: ASTM A 307, Grade A, regular low-carbon steel bolts and nuts. Provide hexagonal heads and nuts for all connections.

G. High-Strength Threaded Fasteners: Heavy hexagon structural bolts, heavy hexagon nuts, and hardened washers, as follows:

1. Quenched and tempered medium-carbon steel bolts, nuts and washers, complying with ASTM A325 or ASTM A490. Refer to drawings for diameter.

2. Direct tension indicator washers or bolts may be used at Contractor's option.

3. Provide hot-dipped galvanized fasteners at relieving angles.

L. Shop Drawings:

1. Shop Drawing Review: Electronic files of structural drawings will not be provided to the contractor for preparation of shop drawings. Reproduction of any portion of the Construction Documents for use as Shop drawings and/or Erection Drawings is prohibited. Shop drawings and/or Erection drawings created from reproduced Construction Documents will be returned without review.

    a. Review of the shop drawings will be made for the size and arrangement of the members and strength of the connections. Conformance of the Shop Drawings to the Contract Drawings remains the responsibility of the General Contractor. Engineer's review in no way relieves the General Contractor of this responsibility.

    b. Shop drawings will not be reviewed as partial submittals. A complete submittal shall be provided and shall include; erection and piece drawings indicating all members, braced frames, moment frames and connections. Incomplete submittals will not be reviewed.

2. Test Reports: Submit copies of reports of tests conducted on shop and field bolted and welded connections. Include data on type(s) of test conducted and test results.

1.06 DELIVERY, STORAGE AND HANDLING:

A. Deliver materials to site at such intervals to insure uninterrupted progress of work.

B. Deliver anchor bolts and anchorage devices, which are to be embedded in cast-in-place, in ample time to not delay work.

C. Store materials to permit easy access for inspection and identification. Keep steel members off ground, using pallets, platforms, or other supports. Protect steel members and packaged materials from corrosion and deterioration.

D. Do not store materials on structure in a manner that might cause distortion or damage to members or supporting structures. Steel materials shall be stored in a manner to avoid ponding of precipitation on members. Repair or replace damaged materials or structures as directed.

3. Electronic Submittals shall be submitted in Protected Document Format (PDF) compatible with Adobe Acrobat Professional version 7.0 or later. Electronic files shall not be broken into smaller individual files. File sizes too large to process email or within a file transfer protocol (FTP) site shall be provided on a CD.

4. The submission of submittals electronically does not relieve the contractor of their responsibility to review the submittal prior to transmission to the Engineer. Electronic Submittals shall include contractor comments, and a statement and/or stamp of approval by Contractor, representing that the Contractor has seen and examined the submittal and that all requirements listed in this Section and Division 1 have been complied with. Electronic submittals without the Contractor's approval will be rejected and returned.

5. The Engineer assumes no responsibility for the printed reproduction of submittals reviewed electronically, transmission errors or returned electronic submittals that become corrupted or are otherwise not accessible by the Contractor's or Subcontractor's computer hardware and/or software.

I. Product Data: Submit producer's or manufacturer's specifications and installation instructions for the following products. Include laboratory test reports and other data to show compliance with specifications (including specified standards).

1. Structural steel certified mill reports for each grade of steel covering chemical and physical properties and yield strengths.

2. High-strength bolts (each type), including nuts and washers.

3. Structural steel primer paint (where applicable).

4. Structural steel mid and top coat paint (where applicable).

5. AWS D1.1 Welder certifications.

6. Expansion/Adhesive Anchors (coordinate with section 03310).

J. Fabricator's Quality Control Procedures: Fabricator shall submit their written procedural and quality control manuals, and evidence of periodic auditing of fabrication practices by an approved inspection Agency.

K. Fabricator's Certificate of Compliance: At completion of fabrication, fabricator shall submit a certificate of compliance stating that the work was performed in accordance with the construction documents.

E. Submittals not reviewed by the General Contractor prior to submission to the Engineer will not be reviewed. Include on the submittal statement or stamp of approval by Contractor, representing that the Contractor has seen and examined the submittal and that all requirements listed in Division 1 have been complied with.

F. Engineer will review submittals a maximum of two review cycles as part of their normal services. If submittals are incomplete or otherwise unacceptable and re-submitted, General Contractor shall compensate Engineer for additional review cycles.

G. Hardcopy Submittals: Submit three prints. Prints will be reviewed by the Engineer, and then the Architect. One marked print will be returned to Contractor for printing and distribution. Multiple copies will not be marked by the Engineer.

H. Electronic Submittals:

1. Contractor shall include in the submittal schedule an indication of submittals that are intended to be submitted electronically. Upon receipt of the submittal schedule, the Engineer reserves the right to indicate submittals that will not be accepted electronically. Paper copies of such submittals shall be furnished as referenced in this specification.

2. The Engineer reserves the right to require paper copies of submittals that are received electronically. Provide Engineer one (1) paper copies in addition to the electronic submittal. Paper copy will be retained and electronic copy will be returned. Review cycle for such submittals shall not commence until such time that the paper copies are received.

3. AISC "*Specifications for Structural Joints using ASTM A 325 or A 490 Bolts*" approved by the Research Council on Structural Connections of the Engineering Foundation.

4. AISC 341, "Seismic Provisions for Steel Buildings".

5. AWS D1.1 - "Structural Welding Code" - Steel.

6. AWS D1.3 - "Structural Welding Code" - Sheet Steel.

7. ASTM A6 "General Requirements for Delivery of Rolled Steel Plates, Shapes, Sheet Piling and Bars for Structural Use."

8. "Code of Federal Regulations, Part 1926" per the Occupational Safety and Health Administration (OSHA), Department of Labor (Latest Revision).

B. Qualifications for Welding Work: Qualify welding processes and welding operators in accordance with AWS D1.1 "Standard Qualification Procedure."

1. Provide certification that welders to be employed in work have satisfactorily passed AWS D1.1 qualification tests and maintained a current certification. Current certification and/or continuity log shall be submitted and be available in the field.

2. If re-certification of welders is required, retesting will be the Contractor's responsibility.

C. Fabricator Qualifications: Fabricator must be a member of the American Institute of Steel Construction (AISC), be certified for SBD – Conventional Steel Building Structures, STD – Standard for Steel Building Structures. Fabricator shall be certified at time of bidding and for duration of project.

1.05 SUBMITTALS

A. Unless otherwise specified, submittals required in this section shall be submitted for review. Submittals shall be prepared and submitted in accordance with this section and Division 1.

B. General Contractor shall submit a Submittal Schedule to the engineer within 30 days after they have received the Owner's Notice to Proceed.

C. All submittals shall be reviewed and returned to the Architect within 10 working days.

D. INCOMPLETE SUBMITTALS WILL NOT BE REVIEWED.

SECTION 05120

STRUCTURAL STEEL

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. The drawings and general conditions of the contract including General and Supplementary Conditions and other Division 1 Specification sections apply to work of this section.

B. Examine all other sections of the Specifications for requirements which affect work of this Section whether or not such work is specifically mentioned in this Section.

C. Coordinate work with that of all trades affecting or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under the Contract.

1.02 DESCRIPTION OF WORK:

A. Extent of structural steel work is shown on drawings, including schedules, notes and details to show size and location of members, typical connections, and type of steel required.

B. Structural steel is that work defined in AISC "Code of Standard Practice" and as otherwise shown on drawings.

1.03 RELATED WORK

1. Section 03310 – Shotcrete Walls

1.04 QUALITY ASSURANCE:

A. Codes and Standards: Comply with latest provisions of the following, except as otherwise indicated:

1. AISC "Code of Standard Practice for Steel Buildings and Bridges", Latest Edition.

a. Exclude the word "structural" in reference to the "Design Drawings" in section 3.1 of the Code.

2. AISC "Specification for Structural Steel Buildings", including "Commentary" and Supplements issued thereto.

splices. The sound shotcrete at the edges of removed sections shall be trimmed to a slope of approximately 45 degrees with the surface of the work and shall be thoroughly moistened prior to placement of the new shotcrete.

E. Any portions of the work having thickness less than those specified may be repaired by the placement of additional layers of shotcrete, provided that such repair is expressly approved by the Engineer.

F. Surfaces of the work to which additional shotcrete is to be applied shall be prepared as required by this Specification.

G. Curing as specified in Section 14 of this Specification shall be applied to repaired areas immediately after the repairs are completed.

4.04 – FORMS

Forms shall be incidental to this Item and shall meet the following requirements:

A. Forms shall be structurally adequate and of such design that rebound or accumulated loose sand can freely escape or be readily removed.

B. Shooting strips shall be used at corners, edges, and on surfaces where necessary to obtain true lines and proper thickness.

C. Ground Wires - Where practicable, ground wires shall be installed as guides to accurately establish the specified contour of the finished surface of shotcrete.

1. Ground wires shall be set and used as guides for templates in forming curved and molded surfaces.

2. When shotcrete is to be placed on horizontal or sloping surfaces, headers and ground wires shall be provided to the extent necessary to insure control of slab thickness.

3. Ground wires shall be tightened and kept taut, secure, and true to line and plane during placement of shotcrete and shall be removed when placement is completed.

D. Header boards will be required where the drawings indicate a square edge and at required joints. Form surfaces shall be thoroughly cleaned and a form release agent applied before shotcrete is placed.

END OF SECTION

F. When dry heat is used to protect shotcrete, means of maintaining an ambient humidity of at least 40 percent shall be provided unless the shotcrete has been coated with curing compound as specified in Section 3.05 of this specification or is covered tightly with an approved impervious material.

4.02 – PLACING IN HOT WEATHER

When climatic factors such as high air temperature, reduced relative humidity and increased wind velocities are present, or conditions are such that the temperature of placed shotcrete exceeds 90° F at, or during the first 24 hours after placement, the following provisions shall also apply:

A. The Contractor shall maintain the temperature of the shotcrete below 90° F during mixing, conveying, and placing using the methods given in items B, C, and D below.

B. Exposed shotcrete surfaces that tend to dry or set too rapidly shall be continuously moistened by means of fog sprays or otherwise protected from drying immediately after placement.

C. Shotcrete surfaces exposed to the air shall be covered as soon as the shotcrete has hardened sufficiently and shall be kept continuously wet for at least the first 24 hours of the curing period, and for the entire curing period unless curing compound is applied as specified in Subsection D, below.

D. If moist curing is discontinued before the end of the curing period, white pigmented curing compound shall be applied immediately, following the procedures specified in Section 3.06 of this Specification.

4.03 – REPLACEMENT OR REPAIR OF SHOTCRETE APPLICATION

A. When shotcrete lacks uniformity, exhibits segregation, honeycombing, or laminations, or contains dry patches, slugs, voids or sand pockets the Contractor shall remove and replace the defective shotcrete. The Engineer's concurrence in the extent of removal and replacement is required.

B. Prior to starting significant removal and replacement work the Contractor shall obtain the Engineer's approval of their plan for making the repair. Such approval shall not be considered a waiver of the Contractor's responsibility to complete removal of defective work if the completed repair does not produce shotcrete of the required quality and appearance.

C. Repair work shall be performed only when the Engineer is present.

D. Repair shall be made with shotcrete conforming to this Specification. When removal of defective shotcrete is required, reinforcement damaged or destroyed shall be replaced prior to replacement of the shotcrete. At the edges of removed sections the sound shotcrete shall be carefully trimmed to the extent required to expose sufficient reinforcement for effecting competent

G. Surfaces damaged by subsequent construction operations during the curing period shall be resprayed in the same manner as for the original applications.

3.06 – PLACING REINFORCEMENT

A. Comply with Concrete Reinforcing Steel Institute's recommended practice for "Placing Reinforcing Bars", for details and methods of reinforcement placement and supports, and as herein specified.

1. Clean reinforcement of loose rust and mill scale, earth, ice, and other materials which reduce or destroy bond with concrete.

2. Accurately position, support and secure reinforcement against displacement by formwork, construction, or concrete placement operations. Locate and support reinforcing by metal chairs, runners, bolsters, spacers and hangers, as required.

3. Install welded wire fabric in flat sheets in as long lengths as practicable. Lap adjoining pieces at least two full mesh and lace splices with wire. Offset end laps in adjacent widths to prevent continuous laps in either direction.

PART 4 RELATED WORK

4.01 – PLACING IN COLD WEATHER

When the atmospheric temperature may be expected to drop below 40° F at the time shotcrete is placed, or at any time during the curing period, the following provisions shall also apply:

A. Shotcrete placement shall be permitted when the air temperature is at least 40° F and rising. Placement shall be discontinued if the temperature falls to 40° F and is expected to continue to fall.

B. The temperature of the shotcrete at time of placing shall not be less than 50° F nor more than 90° F. The temperature of neither aggregates nor mixing water shall be more than 100° F just prior to mixing with the cement.

C. When the daily minimum temperature is less than 40° F, shotcrete shall be insulated or housed and heated after placement. The temperature of the shotcrete and air adjacent to the shotcrete shall be maintained at not less than 50° F nor more than 90° F for the duration of the curing period.

D. Methods of insulating, housing and heating the structure shall be in accordance with "Standard Specification for Cold Weather Concreting," ACI Standard 306.1.

E. The use of accelerators or antifreeze compounds will not be allowed unless otherwise specified.

F. Material that rebounds and accumulates on subgrade surfaces or reinforcing steel ahead of the shotcrete being placed shall be removed and discarded.

3.04 – FINISHING

A. Rebound material shall be carefully swept off the finished shotcrete surface and discarded before it becomes too hard for removal.

B. After the shotcrete has been placed to the depth required, the surface shall be checked with a straightedge or template and any low spots shall be brought up to grade by placing additional shotcrete.

C. The finished surface of the shotcrete shall be left as a smooth gun finish unless screeding and or further finishing are specified.

3.05 – CURING

A. Shotcrete shall be prevented from drying for a curing period of at least seven (7) days after it is placed. Exposed surfaces shall be kept continuously moist for the entire period or until curing compound is applied as specified below. Moisture shall be maintained by sprinkling, flooding or fog spraying, or by covering with continuously moistened canvas, cloth mats, straw, sand or other approved material. Water, or covering, shall be applied in such a way that the shotcrete surface is not eroded or otherwise damaged.

B. Water for curing shall be clean and free from any substances that will cause discoloration of the shotcrete where finished surfaces will be exposed to view.

C. Except as otherwise specified in Section 4.02 of this specification, and except for surfaces to which additional shotcrete is to be applied, shotcrete may be coated with curing compound as an alternative to the continued application of moisture.

D. The compound shall be sprayed on the moist shotcrete surfaces as soon as rebound has been removed and any required repairs are completed, or as soon as water curing is discontinued.

E. The curing compound shall be thoroughly mixed immediately before applied and continuously agitated during application. It shall be applied at a uniform rate of not less than one (1) gallon per 100 square feet of surface for natural gun finishes. Curing compound shall be applied in two (2) applications, one (1) in each direction. If a natural rod, broom, or float finish is specified, the curing compound application rate shall be at least one (1) gallon per 150 square feet. Curing compound shall not check, crack or peel, and shall be free from pinholes or other imperfections.

F. Curing compound shall not be applied to subgrade surfaces or other surfaces requiring bond with subsequently placed shotcrete, such as construction joints, reinforcing steel and other embedded items.

D. All surfaces shall be maintained in a moistened condition for three (3) hours before application of shotcrete. Shotcrete shall not be applied to rebound material, or surfaces on which free water exists. All ice, snow and frost shall be removed and the temperature of all surfaces, to be in contact with the new shotcrete shall be no colder than 40° F.

3.03 – PLACEMENT

A. The Contractor shall have all equipment and materials required for curing available at the site and ready for use before placement of shotcrete begins. No shotcrete shall be placed except in the presence of the Engineer or authorized representative. The Contractor shall give reasonable notice to the Engineer each time shotcrete placement is scheduled. Such notice shall be far enough in advance to give the Engineer adequate time to inspect the surfaces to which the shotcrete is to be applied, the forms, steel reinforcement, and other preparations for compliance with the specifications prior to the start of placement operations.

B. During placement of shotcrete the air pressure shall be adjusted as required to control rebound and density of shotcrete. For a given application, once the optimum operating pressures have been established they shall be maintained constant throughout the application. For dry mix shotcrete, the air pressure at the material outlet or air-inlet on the gun shall be not less than 40 psi plus 5 psi for each 50 feet of length of the discharge hose greater than 100 feet and 5 psi for each 25 feet the nozzle is above the gun (shotcrete delivery equipment). The water pressure at the nozzle shall be not less than 15 psi greater than the air pressure at the material outlet or air-inlet on the gun.

C. For most applications the placing nozzle shall be held between two (2) and six (6) feet from and approximately normal to the surface of the work. At longer distances it may be necessary to increase the nozzle velocity so that the impact velocity will suit the requirements of the application. Corners shall be filled first to establish 45° edge taper.

D. Shotcrete shall be applied in a single thickness or to a layer thickness no greater than that which will cause sagging, sloughing, or dropout. Sags and sloughs shall be cut out and regunned. Replacement shall be accomplished before the previously placed shotcrete has completely set. When shotcrete is placed on a vertical surface, application shall be started at the bottom and be completed at the top.

E. In any case when the placing of shotcrete is interrupted for more than one (1) hour, the edge of the layer shall be sloped off at an angle of approximately 45° to the surface being shot, and the sloped portion shall be covered with a double layer of six (6) ounce burlap and kept continuously moist until the application of shotcrete is resumed. Before applying new material, the sloped portion shall be thoroughly cleaned and wetted by means of an air and water blast or an equally effective method approved by the Engineer.

PART 3 EXECUTION

3.01 – MIXING

A. Dry Mix Shotcrete – The cement and admixtures and other additives (except accelerator) shall be mixed into a predampened homogeneous mass that thoroughly coats the aggregate before being fed through a vibratory screen into the placing equipment. Proper pre-dampening shall be indicated by the "ball-in-hand" test as follows: When a small amount of mix is tightly squeezed the resulting ball will hold together or crack slightly but essentially remain whole. The mix has too little pre-dampening moisture if the ball crumbles into discrete particles when the hand is opened and/or color is light gray. If moisture comes off on the hand, too much pre-dampening moisture is in the mix. The properly pre-dampened dry mix shall be used within 45 minutes after mixing (15 minutes in hot weather conditions with temperatures over 85° F) and any material that becomes dried out or caked after mixing shall be wasted. Rebound material shall not be remixed or reused.

B. Wet Mix Shotcrete – Air-entrainment and chemical admixtures may only be used in wet mix concrete. The cement, sand, admixtures (except accelerator) and water shall be thoroughly mixed in the mixer drum sufficiently to produce shotcrete of the required consistency that is uniform within each batch and uniform from batch to batch when discharged into the placing equipment.

C. Accelerators, if specified, shall be mixed at the nozzle. Ready-mix concrete shall conform to the requirements of ASTM C 94 unless otherwise specified.

D. The entire contents of the mixer shall be discharged from the drum before materials for a succeeding batch are placed therein. A mix that becomes difficult to pump shall be discarded; otherwise, a batch shall be gunned within 1 1/2 hours of batching in normal weather and within 45 minutes during hot weather conditions (temperatures over 85° F). Rebound material shall not be remixed or reused.

3.02 – PREPARATION OF SURFACES TO RECEIVE SHOTCRETE

A. All surfaces to receive or support shotcrete shall be carefully prepared and conditioned. All such prepared surfaces shall be inspected and approved by the Engineer prior to the application of shotcrete.

B. Concrete surfaces shall be thoroughly cleaned by water blasting or sand blasting to remove all dirt, laitance, weak or unbonded mortar, loose material, grease or other deleterious substances.

C. Surfaces on which the shotcrete is to be placed shall be sufficiently rough to insure the adherence of the shotcrete. Offsets which would cause an abrupt and substantial change in thickness of the shotcrete shall be removed or tapered.

E. Water used in mixing or curing shotcrete shall be clean and free from injurious amounts of oil, salt, acid, alkali, organic matter or other deleterious substances.

F. Curing compound shall conform to the requirements of Subsection 3.06.

2.02 – STRENGTH AND QUALITY

A. The compressive strength of shotcrete at the age of 28 days shall be not less than 5000 psi.

B. Shotcrete shall be uniform and dense, free from "drummy" areas that indicate laminations, voids, sand pockets, or disbanded material.

2.03 – CONSISTENCY

A. The proportion of water added to the mixture shall be accurately controlled to produce thorough and uniform hydration of the shotcrete.

B. The consistency of the shotcrete shall be such that the surface of the shotcrete in place shall have a rich, glossy appearance and that the shotcrete shall adhere to the supporting surface without flowing, slumping or sloughing.

C. For application to vertical or overhanging surfaces the mix proportions shall be adjusted so that the placed shotcrete will adhere to a minimum thickness of 3/4-inch without sagging or sloughing.

D. For adjustment of consistency the addition of fly ash or pozzolanic material to the mixture in amounts not greater than 20-percent (by weight) of cement in the mixture will be permitted.

2.04 – REINFORCING MATERIALS

A. Reinforcing Steel Bars: ASTM A 615, Grade 60, deformed and ASTM A 706, Grade 60, deformed, weldable.

B. Welded Wire Fabric: ASTM A 185, welded steel wire fabric. Provide welded wire fabric in flat sheets.

C. Supports for Reinforcement: Provide supports for reinforcement including bolsters, chairs, spacers, and other devices for spacing, supporting and fastening reinforcing bars and welded wire fabric in place. Use plastic or wire bar type supports complying with CRSI recommendations, unless otherwise specified. Wood, concrete block, clay brick and other unspecified devices are not acceptable.

1. A power-driven mixer capable of thoroughly mixing the materials at a rate adequate to insure uniform feeding of the mixture to the placing equipment;

2. A feeding apparatus capable of supplying the mixture to the placing equipment at an adequate and uniform rate.

1.08 – MEASURING MATERIALS

The proportions of the shotcrete mix shall be controlled on the basis of the weight of each component material, unless otherwise specified in this specification, except that water may be measured by volume.

A. Materials shall have the following batch tolerances of their mix proportion weights:

1. Cement, plus or minus two (2) percent;

2. Aggregate, plus or minus four (4) percent;

3. Admixtures, plus or minus six (6) percent.

B. Weighing equipment used shall be accurate to within 0.4 percent of scale capacity.

PART 2 PRODUCTS

2.01 – REPAIR MATERIALS

A. Portland cement shall conform to ASTM C 150, Type I or Type II, unless otherwise approved Use one brand of cement throughout project, unless otherwise acceptable to Architect.

B. Normal weight aggregates shall conform to ASTM C33. Provide from a single source for exposed concrete. Do not use aggregates containing soluble salts or other substances such as iron sulfides, pyrite, marcasite, or ochre, which can cause stains on exposed concrete surfaces. Lightweight aggregates shall conform to ASTM C330.

C. Gradation shall be one of the three options specified by ACI 506R, Table 2.1 unless otherwise specified.

D. Admixtures, if specified, shall meet the requirements indicated. Non-chloride chemical admixtures shall conform to ASTM C 494. Air-entraining admixtures shall conform to ASTM C 260. Fly ash or pozzolanic materials shall conform to ASTM C 618. Calcium chloride shall conform to ASTM D 98 and shall be in flake or pellet form.

4. If applicable, directs the finisher or nozzle helper to cutout any sags, sand or rebound pockets.

5. If applicable, and where necessary, directs the finisher or nozzle helper to broom the shotcrete surface prior to application of additional layers.

1.07 – EQUIPMENT

The Contractor shall furnish all equipment necessary for removing deteriorated concrete and for batching, mixing and placing the shotcrete. The equipment shall meet the following requirements:

A. Chipping hammer for removal of existing concrete shall not exceed 15 pounds. Any damage caused to sound concrete due to the use of improper equipment or repair methods shall be repaired at no additional expense to the Owner.

B. The placing equipment for DRY MIX shotcrete shall:

1. Be designed and equipped to receive the dry mix, introduce the mix into a stream of compressed oil free dry air, convey the mix pneumatically through a delivery hose to a nozzle at the point of discharge, inject water under pressure into the suspended stream of dry sand and cement within the nozzle, and spray the resulting shotcrete mix onto the surface of the work at a uniform rate and at a controlled velocity.

2. Be equipped with accurate gauges to indicate the air pressure and water pressure

3. Be equipped with devices capable of accurately controlling the air pressure at any level between 50-psi and 80-psi.

4. Be equipped with devices capable of accurately controlling the water pressure at any level between 50-psi and 100-psi, and the rate of application of water at the nozzle.

C. The placing equipment for WET MIX shotcrete shall:

1. Be designed and equipped to receive the shotcrete from the mixer, convey it through a delivery hose to a nozzle at the point of discharge, accelerate it in the nozzle by means of compressed oil free dry air, and spray it onto the surface of the work.

2. Be capable of delivering shotcrete to the nozzle uniformly and continuously and discharging it from the nozzle at a uniform rate and at a controlled velocity sufficient for all parts of the work.

D. Batch and continuous mixing equipment shall include:

1.05 – INSPECTION AND TESTING

A. Procedures for preparing shotcrete test panels and the testing specimens sawed or cored from panels will be performed in accordance with ASTM Method C 1140. The compression test specimens will be cores taken from the test panels.

B. One test panel shall be provided during the first shotcete wall placement and shall not less than 18 inches square and not less than six (6) inches thick. Additional test panels may be made periodically as directed by the Engineer during the progress of the work.

C. Cores, taken from the test panels, shall receive standard curing in lime-saturated water at 73.4° +/- 3.0° F within 24 hours after removal. Cores shall continue to receive the prescribed initial cure treatment until standard curing is commenced.

D. For each strength test, three (3) cores will be tested in compression. The test result will be the average of the strengths of the three (3) specimens, except that if one specimen shows manifest evidence of improper sampling, coring, or testing, it will be discarded and the strengths of the remaining two (2) specimens will be averaged. If more than one (1) specimen representing a test shows such defects, the entire test will be discarded.

E. The Contractor shall furnish the forms and make the required test panels and shall provide such facilities, materials and assistance as may be necessary for curing, handling, and protecting the panels. Test panels shall be cast only when the Engineer is present.

1.06 – NOZZLE OPERATOR QUALIFICATIONS

A. The nozzle operator shall be able to document a minimum of 500 hours of experience as a nozzle operator and shall have completed at least one (1) similar application as a nozzle operator, unless otherwise specified.

B. The nozzle operator and application crew members shall be required to meet pre-construction testing requirements administered by the Engineer on a test panel. The Engineer will carefully observe shooting of the test panel or area and note if the nozzle operator examinee:

1. Cleans the shooting surface with air and water prior to shooting.

2. Applies a bonding coat on the shooting surface ahead of the heavier shotcrete applications.

3. Directs shotcrete application around reinforcement in a manner that prevents buildup on the face of the reinforcement and allows the shotcrete to flow and compact tightly around the back of the reinforcement.

SECTION 03310
SHOTCRETE WALLS

PART 1 GENERAL

1.01 – RELATED DOCUMENTS

A. The Drawings and general conditions of the Contract including Division 1 Specification sections apply to work of this section.

B. Examine all other sections of the Specifications for requirements that affect work of this Section whether or not such work is specifically mentioned in this Section.

C. Coordinate work with that of all trades affecting or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under the Contract.

1.02 – DESCRIPTION OF WORK

A. Extent of shotcrete wall work is shown on the drawings, including notes and details. The work shall consist of preparing existing CMU wall surfaces, furnishing, mixing, applying and curing shotcrete repair materials at vertical locations. Except as otherwise specified, either a dry mix or wet mix process may be used.

1.03 – RELATED SECTIONS

A. Structural Steel – Section 05120/05 12 00

1.04 – QUALITY ASSURANCE

A. Codes and Standards: Comply with provisions of the latest edition of the following except where more stringent requirements are shown or specified:

1. ACI 506.2-95 "Specification for Shotcrete"

2. ICRI Technical Guideline No. 03731 "Guide for Selecting Application Methods for the Repair of Concrete Surfaces"

3. "Code of Federal Regulations, Part 1926" per the Occupational Safety and Health Administration (OSHA), Department of Labor (Latest Revision).

B. Materials and installed work may require testing and retesting, as directed by the Engineer, at any time during progress of work. Allow free access to material stockpiles and facilities. Test not specifically indicated to be done at the Owner's expense, including testing of rejected materials and installed work, shall be done at the Contractor's expense.

End of Structural Statement of Special Inspections

Project: P.F.D. Munjoy Hill Fire Station Mono-pole Installation
Date Prepared: March 19, 2012

Fabricator's Certificate of Compliance

Each approved fabricator that is exempt from Special Inspection of shop fabrication and implementation procedures per section 1704.2 of the International Building Code must submit a *Fabricator's Certificate of Compliance* at the completion of fabrication.

Project:

Fabricator's Name:

Address:

Certification or Approval Agency:

Certification Number:

Date of Last Audit or Approval:

Description of structural members and assemblies that have been fabricated:

I hereby certify that items described above were fabricated in strict accordance with the approved construction documents.

_____ _____
Signature Date

_____
Title

Attach copies of fabricator's certification or building code evaluation service report and fabricator's quality control manual

Contractor's Statement of Responsibility

Each contractor responsible for the construction or fabrication of a system or component designated in the Quality Assurance Plan must submit a Statement of Responsibility. The Statement of Responsibility is required for Seismic Design Category C or higher. Make additional copies of this form as required.

Project:

Contractor's Name:

Address:

License No.:

Description of designated building systems and components included in the Statement of Responsibility:

Contractor's Acknowledgment of Special Requirements

I hereby acknowledge that I have received, read, and understand the Quality Assurance Plan and Special Inspection program.

I hereby acknowledge that control will be exercised to obtain conformance with the construction documents approved by the Building Official.

_____ _____

Signature Date

Contractor's Provisions for Quality Control

Procedures for exercising control within the contractor's organization, the method and frequency of reporting and the distribution of reports is attached to this Statement.

Identification and qualifications of the person(s) exercising such control and their position(s) in the organization are attached to this Statement.

SEISMIC RESISTANCE CHECK LIST [IBC 1705.3]

Seismic Design Category N/A

☐ FOR SEISMIC DESIGN CATEGORY C OR HIGHER:

Structural:

☐ The seismic-force-resisting systems

- ☐ Steel Braced Frames and associated connections/anchorage (Not required for SDC C, R=3)
- ☐ Steel Moment Frames and associated connections (Not required for SDC C, R=3)
- ☐ Shear walls: ☐ CMU ☐ Wood ☐ Concrete ☐ Diaphragms: ☐ Floor ☐ Roof
- ☐ Other:

WIND RESISTANCE CHECK LIST [IBC 1705.4]

Wind Exposure Category N/A

REQUIRED	NOT REQUIRED	NOT APPLICABLE	WIND RESISTANCE REQUIREMENTS
☐	☐	☒	In wind exposure Category B, where the 3-second-gust basic wind speed is 120 miles per hour (mph) (52.8 *m/sec)* or greater.
☐	☐	☒	In wind exposure Categories C and D, where the 3-second-gust basic wind speed is 110 mph (49 *m/sec)* or greater.

Project: P.F.D. Munjoy Hill Fire Station Mono-pole Installation
Date Prepared: March 19, 2012

Structural Schedule of Special Inspections

SEISMIC RESISTANCE - STRUCTURAL

VERIFICATION AND INSPECTION IBC Section 1707	REQD Y/N	EXTENT: CONTINUOUS, PERIODIC, SUBMITTAL, OR NONE	COMMENTS	AGENT	AGENT QUALIFICATION	TASK COMPLETED
1. Special inspections for seismic resistance. Special inspection as specified in this section is required for the following:						
a. The seismic-force-resisting systems in structures assigned to Seismic Design Category C, D, E or F	N/A	P	IBC 1707.1	SI1	PE/SE or EIT	
b. Designated seismic systems in structures assigned to Seismic Design Category D, E, or F.	N/A	P	IBC 1707.1	SI1	PE/SE or EIT	
2. Structural steel: Continuous special inspection for structural welding in accordance with AISC 341.	N/A	C	IBC 1707.2	TA1	AWS-CWI	
3. Structural wood:						
a. Continuous special inspection during field gluing operations of elements of the seismic-force-resisting system.	N/A	C	IBC 1707.3	SI1	PE/SE or EIT	
b. Periodic special inspections for nailing, bolting, anchoring and other fastening of components within the seismic-force-resisting system (where spacing is 4"o.c., or less) including drag struts, braces and hold-downs	N/A	P	IBC 1707.3	SI1	PE/SE or EIT	
4. Cold-formed steel framing: Periodic special inspections during welding operations of elements of the seismic-force-resisting system. Periodic special inspections for screw attachment, bolting, anchoring and other fastening of components within the seismic-force-resisting system (where spacing is 4" o.c., or less), including struts, braces, and hold-downs	N/A	-	CFSF for this project not part of the primary seismic-force resisting system.	-	-	
5. Seismic isolation system. Provide periodic special inspection during the fabrication and installation of isolator units and energy dissipation devices if used as part of the seismic isolation system	N/A	-	Seismic isolators not used.	-	-	

Project: P.F.D. Munjoy Hill Fire Station Mono-pole Installation
Date Prepared: March 19, 2012

Structural Schedule of Special Inspections

WOOD CONSTRUCTION

VERIFICATION AND INSPECTION IBC Section 1704.6	REQD Y/N	EXTENT: CONTINUOUS, PERIODIC, SUBMITTAL, OR NONE	COMMENTS	AGENT	AGENT QUALIFICATION	TASK COMPLETED
1. Fabrication of high-load diaphragms						
a. Verify wood structural panel sheathing for grade and thickness	N/A	P	IBC 1704.6	SI1	PE/SE or EIT	
b. Verify the nominal size of framing members at adjoining panel edges	N/A	P	IBC 1704.6	SI1	PE/SE or EIT	
b. Verify the nail or staple diameter and length	N/A	P	IBC 1704.6	SI1	PE/SE or EIT	
b. Verify the number of fastener lines	N/A	P	IBC 1704.6	SI1	PE/SE or EIT	
b. Verify the spacing between fasteners in each line and at edge margins	N/A	P	IBC 1704.6	SI1	PE/SE or EIT	
2. Load Tests for Joist Hangers: Provide evidence of manufacturer's load test in accordance with ASTM D1761 including the vertical load bearing capacity, torsional moment capacity, and deflection characteristics when there is no calculated procedure recognized by the code.	N/A	S	IBC 1716 [submit ICBO reports]	SI1	PE/SE or EIT	
3. Metal-plate-connected wood trusses spanning 60 feet or greater:						
a. Verify the temporary installation restraint / bracing and the permanent individual truss member restraint / bracing is installed per the approved truss submittal package.	N/A	P	IBC 1704.6.2.	SI1	PE/SE or EIT	

Project: P.F.D. Munjoy Hill Fire Station Mono-pole Installation
Date Prepared: March 19, 2012

Structural Schedule of Special Inspection Services

FABRICATION AND IMPLEMENTATION PROCEDURES – WOOD TRUSSES

VERIFICATION AND INSPECTION IBC Section 1704.2	REQD Y/N	EXTENT: CONTINUOUS, PERIODIC, SUBMITTAL, OR NONE	COMMENTS	AGENT	AGENT QUALIFICATION	TASK COMPLETED
1. Fabrications Procedures: Review of fabricator's written procedural and quality control manuals and periodic auditing of fabrication practices by an approved special inspection agency. At the completion of fabrication, the approved fabricator shall submit a certificate of compliance to the building code official stating that the work was performed in accordance with the approved construction documents. -OR- 2. TPI Inspection Program: Fabricator shall participate in the TPI Quality Assurance Inspection Program, and maintain a copy of the Quality Assurance Procedures Manual, QAP-90. Submit copy of certificate. All trusses shall bear the TPI Registered Mark.	N/A N/A	S	Fabricator shall submit one of the two qualifications	SI1	PE/SE or EIT	
3. At completion of fabrication, the approved fabricator shall submit a certificate of compliance to the building code official stating that the work was performed in accordance with the approved construction documents	N/A	S	IBC 1704.2.2	SI1	PE/SE or EIT	

Project: P.F.D. Munjoy Hill Fire Station Mono-pole Installation
Date Prepared: March 19, 2012

Structural Schedule of Special Inspection Services

FABRICATION AND IMPLEMENTATION PROCEDURES – STRUCTURAL STEEL

VERIFICATION AND INSPECTION IBC Section 1704.2	REQD Y/N	EXTENT: CONTINUOUS, PERIODIC, SUBMITTAL, OR NONE	COMMENTS	AGENT	AGENT QUALIFICATION	TASK COMPLETED
1. Fabrications Procedures: Review of fabricator's written procedural and quality control manuals and periodic auditing of fabrication practices by an approved special inspection agency. At the completion of fabrication, the approved fabricator shall submit a certificate of compliance to the building code official stating that the work was performed in accordance with the approved construction documents. -OR- 2. AISC Certification	SI 1	S	Fabricator shall submit one of the two qualifications	SI1	PE/SE or EIT	
3. At completion of fabrication, the approved fabricator shall submit a certificate of compliance to the building code official stating that the work was performed in accordance with the approved construction documents.	SI 1	S	IBC 1704.2.2	SI1	PE/SE or EIT	

Project: P.F.D. Munjoy Hill Fire Station Mono-pole Installation
Date Prepared: March 19, 2012

Structural Schedule of Special Inspections - STEEL CONSTRUCTION

VERIFICATION AND INSPECTION IBC Section 1704.3	REQD Y/N	EXTENT: CONTINUOUS, PERIODIC, SUBMITTAL, OR NONE	COMMENTS	AGENT	AGENT QUALIFICATION	TASK COMPLETED
1. Material verification of high-strength bolts, nuts and washers:						
a. Identification markings to conform to ASTM standards specified in the approved construction documents.	TA 1	P	Applicable ASTM material standards, AISC 360, A3.3	TA1	AWS/AISC-SSI	
b. Manufacturer's certificate of compliance required.	SI 1	S		SI1	PE/SE or EIT	
2. Inspection of high-strength bolting:						
a. Snug-tight joints	TA 1	P		TA1	AWS/AISC-SSI	
b. Pretensioned and slip-critical joints using turn-of-nut with matchmaking, twist-off bolt or direct tension indicator methods of installation.	TA 1	P	AISC LRFD Section M2.5 IBC Sect 1704.3.3	TA1	AWS/AISC-SSI	
c. Pretensioned and slip-critical joints using turn-of-nut without matchmaking or calibrated wrench methods of installation.	TA 1	C		TA1	AWS/AISC-SSI	
3. Material verification of structural steel and cold-formed steel deck:						
a. For structural steel, identification markings to conform to AISC 360.	SI 1	P	AISC 360, M5.5	SI1	PE/SE or EIT	
b. For other steel, identification markings to conform to ASTM standards specified in the approved construction documents.	SI 1	P	Applicable ASTM material standards	SI1	PE/SE or EIT	
c. Manufacturer's certified test reports.	SI 1	S		SI1	PE/SE or EIT	
4. Material verification of weld filler materials:						
a. Identification markings to conform to AWS specification in the approved construction documents.	TA 1	P	AISC 360, M5.5	TA1	AWS/AISC-SSI	
b. Manufacturer's certificate of compliance required.	SI 1	S		SI1	PE/SE or EIT	
5. Submit current AWS D1.1 welder certificate for all field welders who will be welding on this project.	SI 1	S	AWS D1.1	SI1	PE/SE or EIT	
6. Inspection of welding (IBC 1704.3.1):						
a. Structural steel and cold-formed deck:						
1) Complete and partial joint penetration groove welds:	TA 1	C	AWS D1.1	TA1	AWS-CWI	
2) Multipass fillet welds	TA 1	C		TA1	AWS-CWI	
3) Single-pass fillet welds> 5/16"	TA 1	C		TA1	AWS-CWI	
4) Plug and slot welds	TA 1	C		TA1	AWS-CWI	
5) Single-pass fillet welds≤ 5/16"	TA 1	P		TA1	AWS-CWI	
6) Floor and deck welds.	TA 1	P	AWS D1.3	TA1	AWS-CWI	
b. Reinforcing steel:						
1) Verification of weldability of reinforcing steel other than ASTM A706.	N	-	Not applicable.	-	-	
2) Reinforcing steel-resisting flexural and axial forces in intermediate and special moment frames, and boundary elements of special structural walls of concrete and shear reinforcement.	N	C	AWS D1.4 ACI 318: 3.5.2	TA1	AWS-CWI	
3) Shear reinforcement	N	C		TA1	AWS-CWI	
4) Other reinforcing steel.	N	P		TA1	AWS-CWI	
7. Inspection of steel frame joint details for compliance (IBC Sect 1704.3.2) with approved construction documents:						
a. Details such as bracing and stiffening.	SI 1	P	IBC 1704.3.2	SI1	PE/SE or EIT	
b. Member locations.	SI 1	P		SI1	PE/SE or EIT	
c. Application of joint details at each connection:	SI 1	P		SI1	PE/SE or EIT	

Project: P.F.D. Munjoy Hill Fire Station Mono-pole Installation
Date Prepared: March 19, 2012

Structural Schedule of Special Inspections

MASONRY CONSTRUCTION – LEVEL 2

VERIFICATION AND INSPECTION IBC Section 1704.5	REQD Y/N	EXTENT: CONTINUOUS, PERIODIC, SUBMITTAL, OR NONE	COMMENTS	AGENT	AGENT QUALIFICATION	TASK COMPLETED
1. Compliance with required inspection provisions of the construction documents and the approved submittals shall be verified.	N/A	P	ACI530.1, 1.5	SI1	PE/SE or EIT	
2. Verification of f'_m and f'_{AAC} prior to construction and for every 5,000 square feet during construction.	N/A	P	ACI531.1, 1.4B	TA1	ACI-CFTT or ACI-STT	
3. Verification of proportions of materials in premixed or preblended mortar and grout as delivered to site.	N/A	P	ACI530.1, 1.5B	TA1	ACI-CFTT or ACI-STT	
4. Verification of slump flow and VSI as delivered to the site for self-consolidating grout.	N/A	C	ACI530.1, 1.5B.1.b.3	TA1	ACI-CFTT or ACI-STT	
5. The following shall be verified to ensure compliance:						
a. Proportions of site-prepared mortar, grout and prestressing grout for bonded tendons.	N/A	P	ACI530.1, 2.6A	TA1	ACI-CFTT or ACI-STT	
b. Placement of masonry units and construction of mortar joints.	N/A	P	ACI530.1, 3.3B	TA1	ACI-CFTT or ACI-STT	
c. Placement of reinforcement, connectors and prestressing tendons and anchorages.	N/A	P	ACI530, 1.12; ACI530.1, 3.4, 3.6 A	SI1	PE/SE or EIT	
d. Grout space prior to grouting.	N/A	C	ACI530.1, 3.2D	TA1	ACI-CFTT or ACI-STT	
e. Placement of grout.	N/A	C	ACI530.1, 3.5	TA1	ACI-CFTT or ACI-STT	
f. Placement of prestressing grout.	N/A	C	ACI530.1, 3.6C	TA1	ACI-CFTT or ACI-STT	
g. Size and location of structural elements.	N/A	P	ACI530.1, 3.3F	SI1	PE/SE or EIT	
h. Type, size and location of anchors, including other details of anchorage of masonry to structural members, frames or other construction.	N/A	C	ACI530, 1.2.2(e), 1.16.1	SI1	PE/SE or EIT	
i. Specified size, grade and type of reinforcement anchor bolts, prestressing tendons and anchorages.	N/A	P	ACI530, 1.15	SI1	PE/SE or EIT	
j. Welding of reinforcement.	N/A	-	Not applicable. Welding of Reinf Not Allowed	-	-	
k. Preparation, construction and protection of masonry during cold weather and (temperature below 40°F) or hot weather (temperature above 90°F).	N/A	P	IBC 2104.3, 2104.4; ACI530.1, 1.8C, 1.8D	SI1	PE/SE or EIT	
l. Application and measurement of prestressing force.	N/A	C	ACI530.1, 3.6B	TA2	PE/SE or EIT	
6. Preparation of any required grout specimens, mortar specimens and/or prisms shall be observed.	N/A	C	IBC 2105.2.2, 2105.3; ACI 530.1, 1.4	TA1	ACI-CFTT or ACI-STT	

Project: P.F.D. Munjoy Hill Fire Station Mono-pole Installation
Date Prepared: March 19, 2012

Structural Schedule of Special Inspections

MASONRY CONSTRUCTION – LEVEL 1

VERIFICATION AND INSPECTION IBC Section 1704.5	REQD Y/N	EXTENT: CONTINUOUS, PERIODIC, SUBMITTAL, OR NONE	COMMENTS	AGENT	AGENT QUALIFICATION	TASK COMPLETED
1. Compliance with required inspection provisions of the construction documents and the approved submittals shall be verified.	N/A	P	ACI530.1, 1.5	SI1	PE/SE or EIT	
2. Verification of f'_m and f'_{AAC} prior to construction except where specifically exempted by this code.	N/A	P	ACI531.1, 1.4B	TA1	ACI-CFTT or ACI-STT	
3. Verification of slump flow and VSI as delivered to the site for self-consolidating grout.	N/A	C	ACI530.1, 1.5B.1.b.3	TA1	ACI-CFTT or ACI-STT	
4. As masonry construction begins, the following shall be verified to ensure compliance:						
a. Proportions of site-prepared mortar.	N/A	P	ACI530.1, 2.6A	TA1	ACI-CFTT or ACI-STT	
b. Construction of mortar joints.	N/A	P	ACI530.1, 3.3B	TA1	ACI-CFTT or ACI-STT	
c. Location of reinforcement and connectors.	N/A	P	ACI530.1, 3.4, 3.6A	SI1	PE/SE or EIT	
d. Prestressing technique.	N/A	P	ACI530.1, 3.6B	SI1	PE/SE or EIT	
e. Grade and size of prestressing tendons and anchorages.	N/A	P	ACI530.1, 2.4B, 2.4H	SI1	PE/SE or EIT	
5. During construction the inspection program shall verify:						
a. Size and location of structural elements.	N/A	P	ACI530.1, 3.3F	SI1	PE/SE or EIT	
b. Type, size and location of anchors, including other details of anchorage of masonry to structural members, frames or other construction.	N/A	P	ACI530, 1.2.2(e), 2.1.4, 3.1.6	SI1	PE/SE or EIT	
c. Specified size, grade and type of reinforcement, anchor bolts, prestressing tendons and anchorages.	N/A	P	ACI530, 1.12, ACI530.1, 2.4, 3.4	SI1	PE/SE or EIT	
d. Welding of reinforcing bars.	N/A	-	Not applicable. Welding of Reinf Not Allowed	-	-	
e. Preparation, construction and protection of masonry during cold weather (temperature below 40°F) or hot weather (temperature above 90°F).	N/A	P	IBC 2104.3, 2104.4; ACI530.1, 1.8C, 1.8D	SI1	PE/SE or EIT	
f. Application and measurement of prestressing force.	N/A	C	ACI530.1, 3.6B	TA2	PE/SE or EIT	
6. Prior to grouting, the following shall be verified to ensure compliance:						
a. Grout space is clean.	N/A	P	ACI530.1, 3.2D	SI1	PE/SE or EIT	
b. Placement of reinforcement and connectors and prestressing tendons and anchorages.	N/A	P	ACI530, 1.12, ACI530.1, 3.4	SI1	PE/SE or EIT	
c. Proportions of site-prepared grout and prestressing grout for bonded tendons.	N/A	P	ACI530.1, 2.6B	TA1	ACI-CFTT or ACI-STT	
d. Construction of mortar joints.	N/A	P	ACI530.1, 3.3B	TA1	ACI-CFTT or ACI-STT	
7. Grout placement shall be verified to ensure compliance.	N/A	C	ACI530.1, 3.5	TA1	ACI-CFTT or ACI-STT	
a. Grouting of prestressing bonded tendons.	N/A	C	ACI530.1, 3.6C	TA1	ACI-CFTT or ACI-STT	
8. Preparation of any required grout specimens, mortar specimens and/or prisms shall be observed.	N/A	C	IBC 2105.2.2, 2105.3; ACI530.1, 1.4	TA1	ACI-CFTT or ACI-STT	

Project: P.F.D. Munjoy Hill Fire Station Mono-pole Installation
Date Prepared: March 19, 2012

Structural Schedule of Special Inspections
CONCRETE CONSTRUCTION

VERIFICATION AND INSPECTION IBC Section 1704.4	REQD Y/N	EXTENT: CONTINUOUS, PERIODIC, SUBMITTAL, OR NONE	COMMENTS	AGENT	AGENT QUALIFICATION	TASK COMPLETED
1. Inspection of reinforcing steel, including prestressing tendons, and placement	SI 1	P	ACI 318: 3.5, 7.1-7.7	SI1	PE/SE or EIT	
2. Inspection of reinforcing steel welding in accordance with Table 1704.3, Item 5B	N	-	Not applicable. Welding of Reinf Not Allowed	-	-	
3. Inspect bolts to be installed in concrete prior to and during placement of concrete where allowable loads have been increased or where strength design is used.	SI 1	C	IBC 1911.5	SI1	PE/SE or EIT	
4. Inspection of anchors installed in hardened concrete.	SI 1	P	IBC 1212.1	SI1	PE/SE or EIT	
5. Verifying use of required design mix	TA 1	P	ACI 318: Ch 4, 5.2-5.4	TA1	ACI-CFTT or ACI-STT	
6. At time fresh concrete is sampled to fabricate specimens for strength tests, perform slump and air content tests and determine the temperature of the concrete.	N/A	C	ASTM C 172 ASTM C 31 ACI 318: 5.6, 5.8	TA1	ACI-CFTT or ACI-STT	
7. Inspection of concrete and shotcrete placement for proper application techniques	TA 1	C	ACI 318: 5.9, 5.10	TA1	ACI-CFTT or ACI-STT	
8. Inspection for maintenance of specified curing temperature and techniques	SA 1	P	ACI 318: 5.11-5.13	SI1	PE/SE or EIT	
9. Inspection of Prestressed Concrete						
a. Application of prestressing force.	N/A	C	ACI 318: 18.20	TA2	PE/SE or EIT	
b. Grouting of bonded prestressing tendons in seismic force resisting system	N/A	C	ACI 318: 18.18.4	TA1	ACI-CFTT or ACI-STT	
10. Erection of precast concrete members.	N/A	P	ACI 318: Ch 16	SI1	PE/SE or EIT	
11. Verification of in-situ concrete strength, prior to stressing of tendons in post-tensioned concrete and prior to removal of shores and forms from beans and structural slabs.	N/A	P	ACI 318: 6.2	TA1	ACI-CFTT or ACI-STT	
12. Inspect formwork for shape, location and dimensions of the concrete member being formed.	N/A	P	Limitations apply. See below	SI1	PE/SE or EIT	

Limitations of item 12: Special inspection includes periodic review of formwork shape, general location, and formwork dimensions that can be readily measured with conventional tape measure. Verification of building layout, building location, foundation extents, column grids, and foundation elevations is excluded.

Project: P.F.D. Munjoy Hill Fire Station Mono-pole Installation
Date Prepared: March 19, 2012

Structural Schedule of Special Inspections

SOILS & FOUNDATION CONSTRUCTION

VERIFICATION AND INSPECTION IBC Section 1704.7, 1704.8, 1704.9	REQD Y/N	EXTENT: CONTINUOUS, PERIODIC, SUBMITTAL, OR NONE	COMMENTS	AGENT	AGENT QUALIFICATION	TASK COMPLETED
1. Required Verification and Inspection of Soils:						
a. Verify materials below shallow foundations are adequate to achieve the design bearing capacity.	N/A	P	IBC 1704.7	SI2	PE/GE, EIT or ETT	
b. Verify excavations are extended to proper depth and have reached proper material.	N/A	P	IBC 1704.7	SI2	PE/GE, EIT or ETT	
c. Perform classification and testing of compacted fill materials.	N/A	P	IBC 1704.7	TA1	PE/GE, EIT or ETT	
d. Verify use of proper materials, densities and lift thicknesses during placement and compaction of compacted fill.	N/A	C	IBC 1704.7	TA1	PE/GE, EIT or ETT	
e. Prior to placement of compacted fill, observe subgrade and verify that site has been prepared properly.	N/A	P	IBC 1704.7	SI2	PE/GE, EIT or ETT	
2. Required Verification and Inspection of Driven Deep Foundation Elements:						
a. Verify element materials, sizes and lengths comply with the requirements.	N/A	C	IBC 1704.8	TA1	PE/GE, EIT or ETT	
b. Determine capacities of test elements and conduct additional load tests, as required.	N/A	C	IBC 1704.8	SI2	PE/GE, EIT or ETT	
c. Observe driving operations and maintain complete and accurate records for each element.	N/A	C	IBC 1704.8	TA1	PE/GE, EIT or ETT	
d. Verify placement locations and plumbness, confirm type and size of hammer, record number of blows per foot of penetration, determine required penetrations to achieve design capacity, record tip and butt elevations and document any damage to foundation element.	N/A	C	IBC 1704.8	TA1	PE/GE, EIT or ETT	
3. Required Verification and Inspection of Cast-in-Place Deep Foundation Elements:						
a. Observe drilling operations and maintain complete and accurate records for each element.	N/A	C	IBC 1704.9	TA1	PE/GE, EIT or ETT	
b. Verify placement locations and plumbness, confirm element diameters, bell diameters (if applicable), lengths, embedment into bedrock (if applicable) and adequate end bearing strata capacity. Record concrete or grout volumes.	N/A	C	IBC 1704.9	TA1	PE/GE, EIT or ETT	

See Concrete, Masonry, and/or Steel Schedules for additional material inspections for deep foundation elements as applicable.

Structural Schedule of Special Inspections

Qualifications of Inspectors and Testing Technicians

The qualifications of all personnel performing Special Inspection and testing activities are subject to the approval of the Building Official. The credentials of all Inspectors and testing technicians shall be provided to the Special Inspector for their records. *NOTE VERIFICATION THAT QUALIFIED INDIVIDUALS ARE AVAILABLE TO PERFORM STIPULATED TESTING AND/OR INSPECTION SHOULD BE PROVIDED PRIOR TO SUBMITTING STATEMENT. AGENT QUALIFICATIONS IN SCHEDULE ARE SUGGESTIONS ONLY; FINAL QUALIFICATIONS ARE SUBJECT TO THE DISCRETION OF THE REGISTERED DESIGN PROFESSIONAL PREPARING THE SCHEDULE.*

Key for Minimum Qualifications of Inspection Agents:

When the Registered Design Professional in Responsible Charge or Special Inspector of Record deems it appropriate that the individual performing a stipulated test or inspection have a specific certification, license or experience as indicated below, such requirement shall be listed below and shall be clearly identified within the schedule under the Agent Qualification Designation.

PE/SE	Structural Engineer – a licensed SE or PE specializing in the design of building structures
PE/GE	Geotechnical Engineer – a licensed PE specializing in soil mechanics and foundations
EIT	Engineer-In-Training – a graduate engineer who has passed the Fundamentals of Engineering examination

Experienced Testing Technician

ETT	Experienced Testing Technician – An Experienced Testing Technician with a minimum 5 years experience with the stipulated test or inspection

American Concrete Institute (ACI) Certification

ACI-CFTT	Concrete Field Testing Technician – Grade 1
ACI-CCI	Concrete Construction Inspector
ACI-LTT	Laboratory Testing Technician – Grade 1&2
ACI-STT	Strength Testing Technician

American Welding Society (AWS) Certification

AWS-CWI	Certified Welding Inspector
AWS/AISC-SSI	Certified Structural Steel Inspector

American Society of Non-Destructive Testing (ASNT) Certification

ASNT	Non-Destructive Testing Technician – Level II or III.

International Code Council (ICC) Certification

ICC-SMSI	Structural Masonry Special Inspector
ICC-SWSI	Structural Steel and Welding Special Inspector
ICC-SFSI	Spray-Applied Fireproofing Special Inspector
ICC-PCSI	Prestressed Concrete Special Inspector
ICC-RCSI	Reinforced Concrete Special Inspector

National Institute for Certification in Engineering Technologies (NICET)

NICET-CT	Concrete Technician – Levels I, II, III & IV
NICET-ST	Soils Technician - Levels I, II, III & IV
NICET-GET	Geotechnical Engineering Technician - Levels I, II, III & IV

Other

Structural Statement of Special Inspections (Continued)

Special Inspector's/Agent's Final Report

Project: *P.F.D. Munjoy Hill Fire Station Mono-pole Installation*

Special Inspector or Agent: _____

(name) *(firm)*

Designation:

To the best of my information, knowledge and belief, the Special Inspections or testing required for this project, and designated for this Inspector/Agent in the *Statement of Special Inspections* submitted for permit, have been performed and all discovered discrepancies have been reported and resolved.

Interim reports submitted prior to this final report form a basis for and are to be considered an integral part of this final report.

Respectfully submitted,
Special Inspector or Agent:

_____
(Type or print name)

_____
Signature Date

Licensed Professional Seal or
Certification Number

Structural Statement of Special Inspections (Continued)

Final Report of Special Inspections (SSIC/SI 1)

[To be completed by the Structural Special Inspections Coordinator (SSIC/SI 1). Note that all Agent's Final Reports must be received prior to issuance.]

Project: *P.F.D. Munjoy Hill Fire Station Mono-pole Installation*

Location: *Portland, Maine*

Owner: *City of Portland*

Owner's Address: *389 Congress Street*
Portland, Maine 04101

Architect of Record: *N/A* (name) *N/A* (firm)

Structural Registered Design Professional in Responsible Charge: *Bryson T. Welch, P.E.* (name) *Becker Structural Engineers* (firm)

To the best of my information, knowledge and belief, the Special Inspections required for this project, and itemized in the *Statement of Special Inspections* submitted for permit, have been performed and all discovered discrepancies have been reported and resolved.

Interim reports submitted prior to this final report form a basis for and are to be considered an integral part of this final report.

Respectfully submitted,
Structural Special Inspection Coordinator

(Type or print name)

(Firm Name)

Signature Date

Licensed Professional Seal

Structural Statement of Special Inspections (Continued)

List of Agents

Project: *P.F.D. Munjoy Hill Fire Station Mono-pole Installation*

Location: *Portland, Maine*

Owner: *City of Portland*

This *Statement of Special Inspections* encompass the following discipline: **Structural**

(Note: *Statement of Special Inspections* for other disciplines may be included under a separate cover)

This Statement of Special Inspections / Quality Assurance Plan includes the following building systems:

- ☐ Soils and Foundations
- ☒ Cast-in-Place Concrete
- ☐ Precast Concrete System
- ☐ Structural Masonry Systems
- ☒ Structural Steel
- ☐ Wood Construction
- ☐ Special Cases

Special Inspection Agencies	Firm	Address, Telephone, e-mail
1. STRUCTURAL Special Inspections Coordinator (SSIC)	*Becker Structural Engineers (BSE)*	*75 York Street* *Portland, Maine 04101* *207-879-1838* *bryson@beckerstructural.com*
2. Special Inspector (SI 1)	*Becker Structural Engineers (BSE)*	*75 York Street* *Portland, Maine 04101* *207-879-1838* *bryson@beckerstructural.com*
3. Special Inspector (SI 2)	*N/A*	*N/A*
4. Testing Agency (TA 1)	*To Be Determined*	*To Be Determined*
5. Testing Agency (TA 2)	*N/A*	*N/A*
6. Other (O1)	*N/A*	*N/A*

Note: The inspectors and testing agencies shall be engaged by the Owner or the Owner's Agent, and not by the Contractor or Subcontractor whose work is to be inspected or tested. Any conflict of interest must be disclosed to the Building Official, prior to commencing work.

Project: P.F.D. Munjoy Hill Fire Station Mono-pole Installation
Date Prepared: March 19, 2012

Structural Statement of Special Inspections

Project: *P.F.D. Munjoy Hill Fire Station Mono-pole Installation*

Location: *Portland, Maine*

Owner: *City of Portland*

This *Statement of Special Inspections* encompass the following discipline: **Structural**

This *Statement of Special Inspections* is submitted as a condition for permit issuance in accordance with the Special Inspection and Structural Testing requirements of the Building Code. It includes a schedule of Special Inspection services applicable to this project as well as the name of the Structural Special Inspection Coordinator (SSIC) and the identity of other approved agencies to be retained for conducting these inspections and tests.

The Structural Special Inspection Coordinator shall keep records of all Structural inspections and shall furnish inspection reports to the Building Code Official (BCO) and the Structural Registered Design Professional in Responsible Charge (SRDP). Discovered discrepancies shall be brought to the immediate attention of the Contractor for correction. If such discrepancies are not corrected, the discrepancies shall be brought to the attention of the Building Official and the Structural Registered Design Professional in Responsible Charge. The Special Inspection program does not relieve the Contractor of his or her responsibilities.

Interim reports shall be submitted to the Building Official and the Structural Registered Design Professional in Responsible Charge at an interval determined by the SSIC and the BCO.

A *Final Report of Special Inspections* documenting completion of all required Special Inspections, testing and correction of any discrepancies noted in the inspections shall be submitted to the BCO prior to issuance of a Certificate of Use and Occupancy.

Job site safety and means and methods of construction are solely the responsibility of the Contractor.

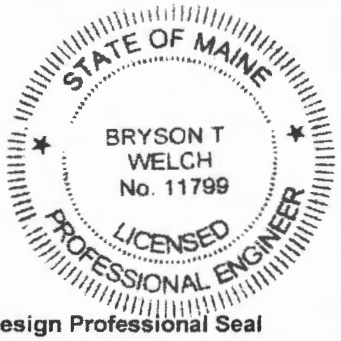
Interim Report Frequency: ☐ *Upon request of Building Official* _____ or ☐ per attached schedule.

Prepared by:

Bryson T. Welch, P.E.

(type or print name of the Structural Registered Design Professional in Responsible Charge)

Signature 3/19/12 Date



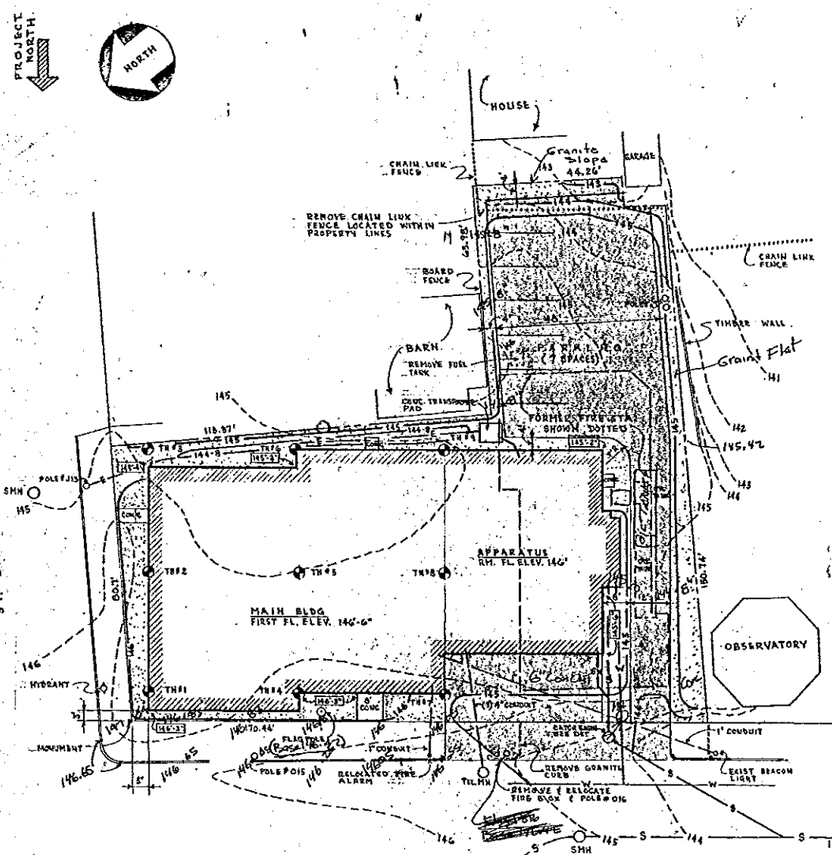
Design Professional Seal

Owner's Authorization:

Signature Date

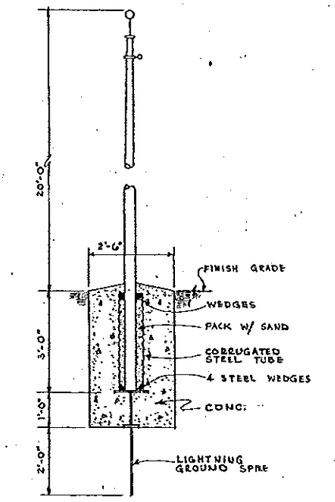
Building Code Official's Acceptance:

Signature Date



SITE PLAN

SCALE 1" = 20'

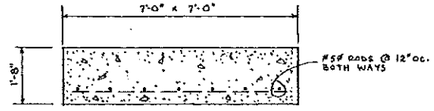


FLAGPOLE DETAIL

SCALE 1/2" = 1'-0"

MATERIALS LEGEND

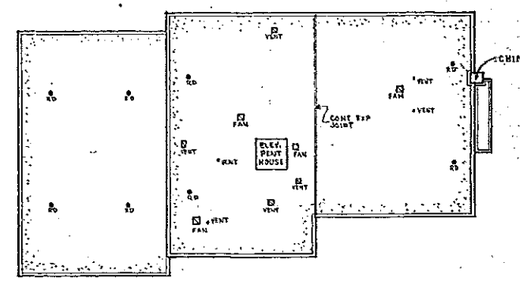
- EARTH
- GRAVEL (COMPACTED)
- CONCRETE
- BRICK
- MASONRY BLOCK
- WOOD (ROUGH FINISH)
- INSULATION (RIGID BATT)



TRANSFORMER PAD DETAIL

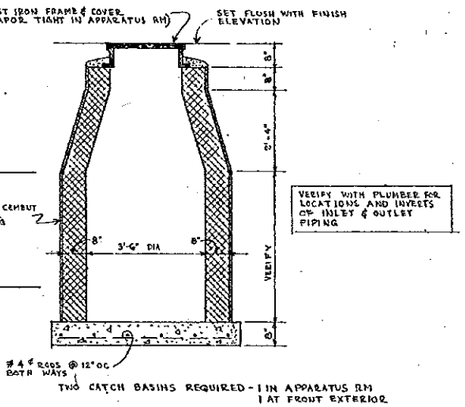
SCALE 1/2" = 1'-0"

DRAWING INDEX



ROOF PLAN

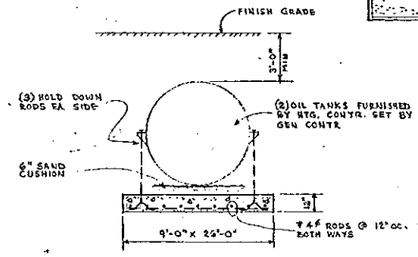
SCALE 1" = 20'-0"



TWO CATCH BASINS REQUIRED - 1 IN APPARATUS RM
1 AT FRONT EXTERIOR

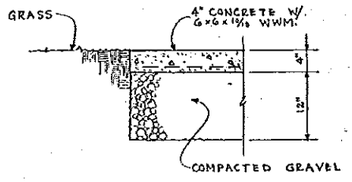
CATCH BASIN DETAIL

SCALE 1/2" = 1'-0"



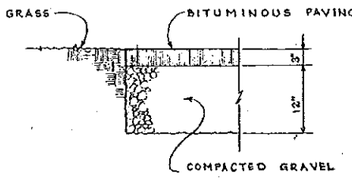
OIL TANK PAD DETAIL

SCALE 1/8" = 1'-0"



WALKWAY DETAIL

SCALE 1" = 1'-0"

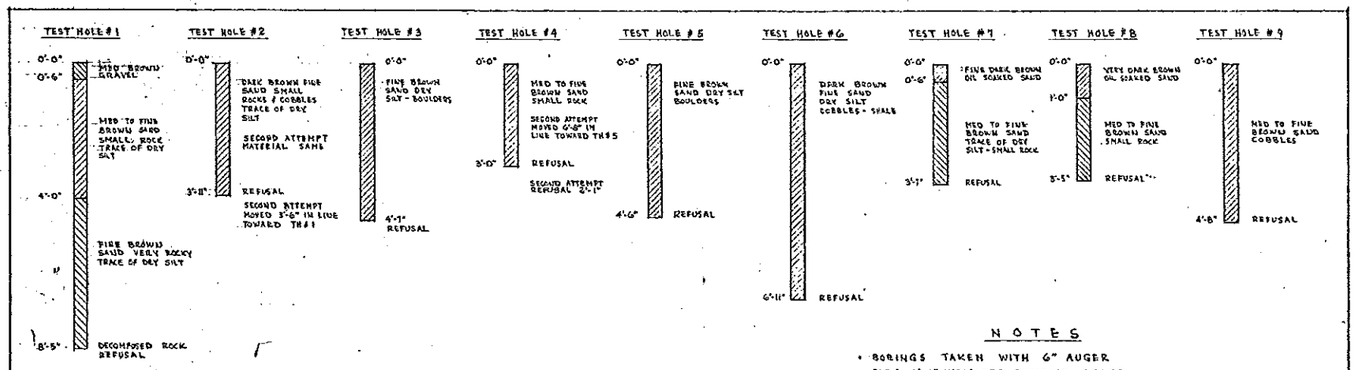


PAVING DETAIL

SCALE 1" = 1'-0"

SITE PLAN LEGEND

- EXISTING CONTOUR
- FINISH CONTOUR
- W — WATER SERVICE
- ET — ELECTRIC & TELEPHONE SERVICE
- S — SEWER / SW = STORM WATER
- GRASS
- BITUMINOUS PAVING
- 00.00 SPOT FINISH GRADES



BORING LOG

NO SCALE

NOTES

- BORINGS TAKEN WITH 6" AUGER
- ELEV. 0'-0" INDICATES EXISTING GRADE
- BORING DATA IS INTENDED SOLELY FOR INFORMATION OF BIDDERS NO GUARANTEE IS MADE OR IMPLIED THAT THE INFORMATION SHOWN IS ACCURATE
- TH# INDICATES BORING NUMBER & LOCATION

REGISTERED ARCHITECT D. W. CHRISTOPHERSON No. 589 STATE OF MAINE

SITE PLAN

MUNJOY HILL NEIGHBORHOOD FACILITY & FIRE STATION
FOR THE CITY OF PORTLAND, MAINE

D.W. CHRISTOPHERSON
ARCHITECT
PORTLAND, MAINE

1

SCALE AS NOTED | DATE AUG. 30, 1976 | C75 06

B-76-MC-23-005

GENERAL NOTES

1. THE NOTES ON THESE DRAWINGS ARE NOT INTENDED TO REPLACE SPECIFICATIONS. SEE SPECIFICATIONS FOR REQUIREMENTS IN ADDITION TO GENERAL NOTES. INCONSISTENCIES BETWEEN THESE DRAWINGS AND THE SPECIFICATIONS SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT PRIOR TO PROCEEDING WITH THE AFFECTED PORTION OF THE WORK.
2. ALL DIMENSIONS, EXISTING CONDITIONS, AND AS-BUILT CONDITIONS MUST BE VERIFIED IN THE FIELD. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE STRUCTURAL ENGINEER BEFORE PROCEEDING WITH THE AFFECTED PART OF THE WORK.
3. THE STRUCTURE IS DESIGNED TO BE SELF SUPPORTING AND STABLE ONLY AFTER THE STRUCTURAL WORK CONTAINED IN THE S- DRAWINGS IS COMPLETED. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO DETERMINE ERECTION PROCEDURES AND SEQUENCE TO ENSURE THE SAFETY OF THE BUILDING AND ITS COMPONENTS DURING ERECTION. THIS INCLUDES THE ADDITION OF NECESSARY SHORING, SHEETING, TEMPORARY BRACING, GUYS OR TIEDOWNS. SUCH MATERIAL SHALL REMAIN THE PROPERTY OF THE CONTRACTOR AFTER COMPLETION OF THE PROJECT.
4. SECTIONS AND DETAILS SHOWN ON ANY STRUCTURAL DRAWINGS SHALL BE CONSIDERED TYPICAL FOR SIMILAR CONDITIONS AS DETERMINED BY THE STRUCTURAL ENGINEER. THE STRUCTURAL ENGINEER RESERVES THE RIGHT TO INTERPRET DETAILS TO ADDRESS OTHER PROJECT CONDITIONS.
5. THE CONTRACTOR SHALL SUBMIT COMPLETE SHOP DRAWINGS FOR ALL PARTS OF THE WORK, INCLUDING DESCRIPTION OF SHORING, AND CONSTRUCTION METHODS AND SEQUENCING WHERE APPLICABLE. NO PERFORMANCE OF THE WORK INCLUDING, BUT NOT LIMITED TO, DEMOLITION OF EXISTING STRUCTURE, OR FABRICATION OR ERECTION OF NEW STRUCTURAL ELEMENTS, SHALL COMMENCE WITHOUT REVIEW OF THE SHOP DRAWINGS BY THE ENGINEER. SUBMIT TWO COPIES. ONE COPY WILL BE REVIEWED AND ONE WILL BE RETURNED. FOR SHOP DRAWINGS AND SUBMITTALS REQUIRED, REFERENCE THE PROJECT SPECIFICATION. CONTRACTOR SHALL ALLOW 10 WORKING DAYS FOR REVIEW.
6. ALL APPLICABLE FEDERAL, STATE, AND MUNICIPAL REGULATIONS SHALL BE FOLLOWED, INCLUDING THE FEDERAL DEPARTMENT OF LABOR OCCUPATIONAL SAFETY AND HEALTH ACT.
7. IN ACCORDANCE WITH THE INTERNATIONAL BUILDING CODE, A STATEMENT OF SPECIAL INSPECTIONS IS REQUIRED AS A CONDITION FOR PERMIT ISSUANCE BY THE LOCAL CODE OFFICIAL. THIS STATEMENT SHALL INCLUDE A COMPLETE LIST OF MATERIALS AND WORK REQUIRING SPECIAL INSPECTIONS, THE INSPECTIONS TO BE PERFORMED AND A LIST OF THE INDIVIDUALS, APPROVED AGENCIES AND FIRMS INTENDED TO BE RETAINED FOR CONDUCTING SUCH INSPECTIONS.

DESIGN LOADS

1. BUILDING CODE:
   INTERNATIONAL BUILDING CODE, 2009 EDITION
   INTERNATIONAL EXISTING BUILDING CODE, 2009 EDITION
   ASCE 7-05 MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES
2. DESIGN LOADS:
   DESIGN LOADS FOR THE MONO-POLE SUPPORT STRUCTURE WAS PROVIDED BY SABRE TOWER & POLES, PROPOSAL NUMBER: 12-6917-RAM DATED FEBRUARY 24, 2012.

TESTING

1. OWNER WILL ENGAGE A QUALIFIED TESTING AGENCY TO CONDUCT PERIODIC TESTS TO CONFIRM CONSTRUCTION IS IN CONFORMANCE WITH SPECIFIED PROCEDURES AND SPECIFICATIONS.
2. REFERENCE THE PROJECT STATEMENT OF SPECIAL INSPECTIONS AND SPECIFICATIONS FOR ALL TESTING REQUIREMENTS.
3. TEST RESULTS SHALL BE SUBMITTED TO THE STRUCTURAL ENGINEER FOR REVIEW WITHIN 72 HOURS OF COMPLETION OF EACH TEST.

CONCRETE NOTES

1. CONCRETE WORK SHALL CONFORM TO "ACI MANUAL OF CONCRETE PRACTICE", LATEST EDITION. THIS PUBLICATION IS AVAILABLE THROUGH THE AMERICAN CONCRETE INSTITUTE (248) 848-3800.
2. ALL CONCRETE SHALL HAVE A 28-DAY COMPRESSIVE STRENGTH OF 5,000 PSI, U.N.O. ADDITIONAL CONCRETE MIX PERFORMANCE DATA INCLUDING AIR CONTENT, WATER-CEMENT RATIO, AGGREGATE SIZE, SLUMP, ETC. HAS BEEN INCLUDED IN THE PROJECT SPECIFICATIONS. SEE THE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
3. CONCRETE SHALL NOT BE PLACED IN WATER OR ON FROZEN GROUND.
4. REINFORCING BARS SHALL CONFORM TO ASTM A615 GRADE 60 DEFORMED BARS AND SHALL BE DETAILED, FABRICATED AND PLACED IN ACCORDANCE WITH ACI 315, LATEST EDITION.
5. MINIMUM CONCRETE PROTECTIVE COVERING FOR REINFORCEMENT, UNLESS NOTED OTHERWISE, SHALL BE AS FOLLOWS:
   A. SURFACES CAST AGAINST AND PERMANENTLY IN CONTACT WITH EARTH, 3.0"
   B. FORMED SURFACES IN CONTACT WITH EARTH OR EXPOSED TO WEATHER
      #5 BARS, 5/8" DIAMETER WIRE AND SMALLER, 1.5"
      #6 THROUGH #11 BARS, 2.0"
   C. SURFACES NOT IN CONTACT WITH EARTH OR EXPOSED TO WEATHER
      WALLS, SLABS, JOISTS #11 BARS AND SMALLER, 1.0"
      BEAMS, GIRDERS, AND COLUMNS; ALL REINFORCEMENT, 1.5"
6. REINFORCEMENT SHALL BE CONTINUOUS AROUND CORNERS AND AT INTERSECTIONS. PROVIDE LAPPED BARS AT NECESSARY SPLICES OR HOOKED BARS AT DISCONTINUOUS ENDS. PROVIDE TENSION LAP SPLICES PER THE SCHEDULE THIS DRAWING, FOR ALL REINFORCING UNLESS OTHERWISE SHOWN ON PLAN.
7. WELDING OF REINFORCEMENT IS NOT PERMITTED
8. FOR ALL OPENINGS IN CONCRETE WALLS AND SLABS, PROVIDE SUPPLEMENTAL REINFORCING AROUND OPENING AS SHOWN ON THE CONTRACT DOCUMENTS TYPICAL DETAILS.
9. DRAWINGS SHOWING LOCATION OF CONSTRUCTION AND CONTROL JOINTS AND CONCRETE PLACING SEQUENCE SHALL BE SUBMITTED TO THE STRUCTURAL ENGINEER FOR REVIEW PRIOR TO PREPARATION OF THE REINFORCEMENT SHOP DRAWINGS. CONCRETE SHALL BE PLACED WITHOUT HORIZONTAL CONSTRUCTION JOINTS EXCEPT WHERE SHOWN OR NOTED.
10. ANCHOR RODS SHALL BE HEADED RODS CONFORMING TO ASTM F1554, GRADE 36 KSI WELDABLE STEEL, UNLESS NOTED OTHERWISE ON DRAWINGS. ANCHOR RODS SHALL BE HOT-DIPPED GALVANIZED.
11. ALL GROUT BENEATH BASE PLATES & BEARING PLATES SHALL BE "5-STAR" 5000-PSI NON-SHRINK GROUT BY U.S. GROUT CORP.
12. INSTALLATION OF REINFORCEMENT SHALL BE COMPLETED AT LEAST 24 HOURS PRIOR TO THE SCHEDULED CONCRETE PLACEMENT. NOTIFY STRUCTURAL ENGINEER OF COMPLETION AT LEAST 24 HOURS PRIOR TO THE SCHEDULED COMPLETION OF THE INSTALLATION OF REINFORCEMENT.
13. ALL ITEMS TO BE EMBEDDED INTO CONCRETE SHALL BE INSTALLED PRIOR TO PLACEMENT OF CONCRETE. PROVIDE ADDITIONAL REINFORCEMENT AND/OR TEMPLATES AS REQUIRED TO ENSURE THE CORRECT POSITIONS OF EMBEDMENTS. "WET SETTING" OF EMBEDMENTS INTO CONCRETE IS STRICTLY PROHIBITED. EMBEDMENTS INCLUDE, BUT NOT BY LIMITATION, REINFORCEMENT, REINFORCING DOWELS, EMBEDDED PLATES, ANCHOR RODS, ANCHOR INSERTS, AND SLEEVES.

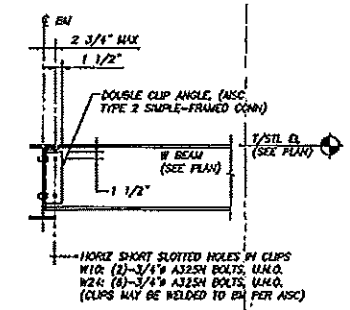
STRUCTURAL STEEL NOTES

1. STRUCTURAL STEEL FABRICATION, ERECTION, AND CONNECTION DESIGN SHALL CONFORM TO AISC "SPECIFICATION FOR THE DESIGN FABRICATIONS, AND ERECTION OF STRUCTURAL STEEL" LATEST EDITION, AND THE "CODE OF STANDARD PRACTICE", LATEST EDITION.
2. STRUCTURAL STEEL: STEEL PLATES, SHAPES, AND BARS, CONFORM TO ASTM A36 UNLESS NOTED OTHER WISE (U.N.O.). STRUCTURAL STEEL SHAPES DESIGNATED ON THE DRAWINGS FOR WIDE-FLANGE SECTIONS: ASTM A992 (ASTM A572 GRADE 50 WITH SPECIAL REQUIREMENTS PER AISC TECHNICAL BULLETIN #3 DATED MARCH, 1997)
3. STRUCTURAL TUBING: CONFORM TO ASTM A500 GRADE B, 46 KSI.
   STRUCTURAL PIPE: CONFORM TO ASTM A53 TYPE E GRADE B, 35 KSI.
4. ALL STEEL SHALL BE ABRASIVELY BLAST CLEANED AND PRIMED WITH ORGANIC ZINC PRIMER, TNEME-ZINC 90-97. MID-COAT WITH EPOXY COATING, F.C. TYPOXY SERIES 27. TOP COAT WITH POLYURETHANE FINISH, ENDURA-SHIELD SERIES 73. TOUCH-UP ALL DAMAGE WHICH OCCURS DURING HANDLING & ERECTION OR FIELD WELDING USING THE SPECIFIED SYSTEM BUILD-UP. COLOR SHALL MATCH EXISTING ROOF (FLAT BLACK). COLOR SAMPLE SHALL BE SUBMITTED TO OWNER PRIOR TO FABRICATION FOR APPROVAL.
5. FIELD CONNECTIONS SHALL BE BOLTED USING HOT DIPPED GALVANIZED ASTM A325N HIGH STRENGTH BOLTS (U.N.O.) EXCEPT WHERE SLIP CRITICAL CONNECTIONS ARE REQUIRED AND NOTED BY A325 (SC) ON THE DRAWINGS.
6. WHERE WELDING IS INDICATED, ALL WELDING SHALL CONFORM TO AWS D1.1-LATEST EDITION. ELECTRODES SHALL CONFORM TO AWS A5.1 E70XX SERIES WITH PROPER ROD TO PRODUCE OPTIMUM WELD (LOW HYDROGEN)
7. SEE CONCRETE NOTES AND DRAWINGS FOR ANCHOR BOLT INFORMATION, TYP.
8. PROVIDE 1/4" THICK LEVELING PLATE UNDER ALL COLUMN BASE PLATES UNLESS OTHERWISE NOTED. LEVELING PLATES SHALL BE SET AND GROUTED PRIOR TO ERECTING COLUMNS.

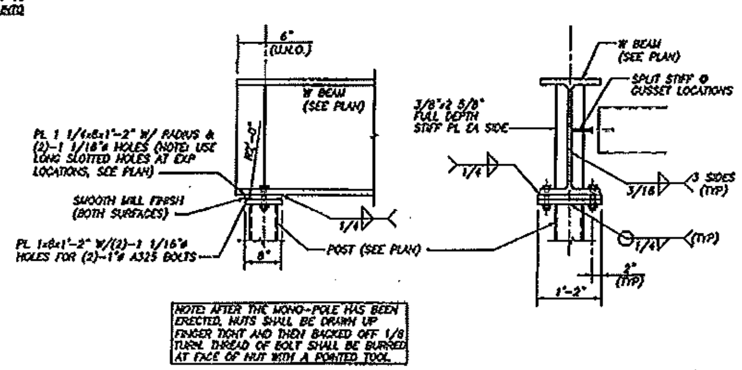
METAL DECK

1. IF EXISTING ROOF DECK IS DAMAGED DURING REMOVAL FOR SHEARWALL INSTALLATION, REPLACE WITH NEW DECK. VERIFY IN FIELD TYPE OF EXISTING ROOF DECK, MEASURE GAGE AND PROVIDE PATCH OF SIMILAR THICKNESS.
2. NEW METAL ROOF AND FLOOR DECK SHALL BE FORMED OF STEEL SHEETS CONFORMING TO ASTM STANDARD A611.
3. FASTEN ROOF DECK WITH A MINIMUM OF 5/8" DIA PUDDLE WELDS SPACED IN A 36/7 PATTERN (1.5B DECK) WITH A MINIMUM OF (2) WELDS PER UNIT AT EACH SUPPORT IF COMPLETE SHEET IS UTILIZED. WHERE SUPPORT IS PARALLEL TO SUPPORT, AT EDGE OF BUILDING, AT EDGE OF OPENING OR DECK DISCONTINUITY PROVIDE PUDDLE WELDS AT 6" O.C. SECURE DECK TO EACH SUPPORTING MEMBER IN RIBS WHERE SIDELAPS OCCUR. DECK UNITS SHALL BEAR OVER THE END OF SUPPORTS BY A MINIMUM OF 1.5". SIDELAPS: #10 TEK SCREWS, (6) PER SPAN FOR B DECK.

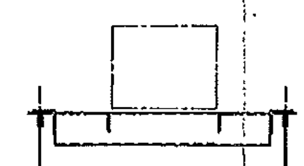
REBAR LAP SPLICE TABLE	
BAR SIZE	LAP LENGTH (5,000 PSI)
#4	20"
#5	24"
#6	30"
#7	54"
#8	62"



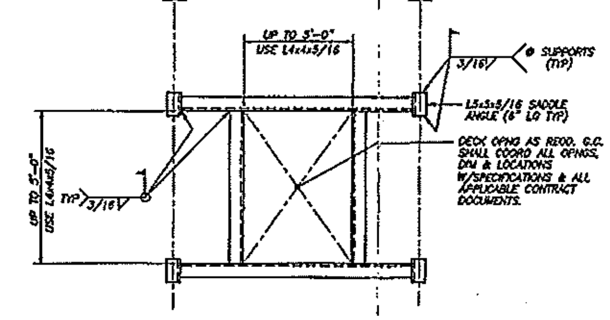
TYP BEAM TO GIRDER CONN
N.T.S.



TYP BEAM/POST DETAILS
N.T.S.

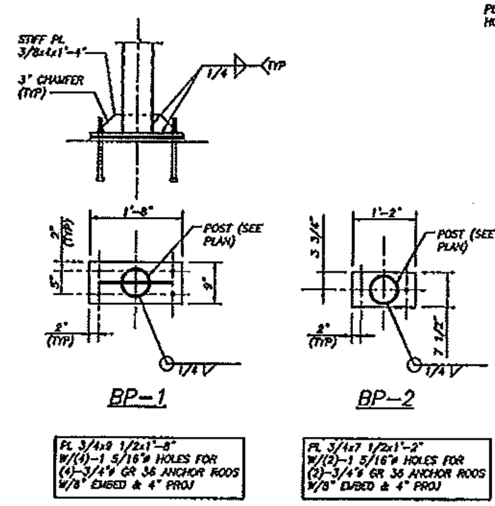


SECTION



PLAN OF TYPICAL OPENING IN ROOF DECK
N.T.S.

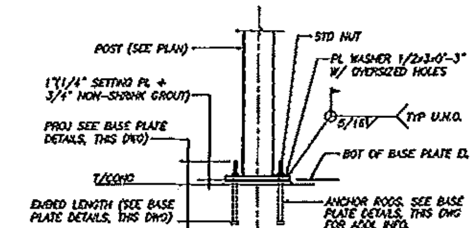
NOTE:
DETAIL TYPICAL IF OPENING IS LARGER THAN 12"ø OR CUTS MORE THAN (1) DECK RIB. FOR OPENINGS LESS THAN 12"ø, REINF OPNG W/16GA MIN PL. MIN PL LENGTH SHALL BE "D"+4". EXTEND AS REQD FOR 2" MIN BRG ON DECK RIB.



BP-1

BP-2

TYP BASE PLATE DETAILS
N.T.S.



TYP POST BASE DETAIL
N.T.S.

BECKER STRUCTURAL ENGINEERS

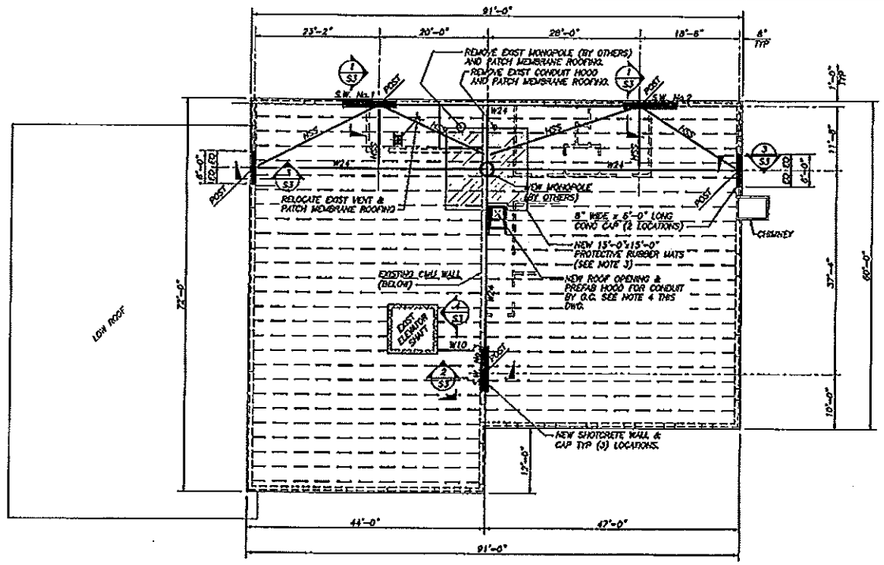
STATE OF MAINE — BRYSON T. WELCH — LICENSED PROFESSIONAL ENGINEER

PFD MUNJOY HILL FIRE STATION
MONO-POLE INSTALLATION
PORTLAND, MAINE

GENERAL NOTES

Designed: BTW	Scale: NOTED
Drawn: APP	Date: 03/19/12
Checked: PBB	Becker Job Number: 2512

S0



EXIST ROOF FRAMING PLAN

3/32=1'-0"

FRAMING PLAN NOTES:

1. EXISTING MONOPOLE REMOVAL, COMMUNICATIONS SWITCHOVER, NEW MONOPOLE PROCUREMENT & ERECTION BY OTHERS. REF CITY OF PORTLAND SPECIAL PROVISIONS OF THE SPECIFICATIONS FOR ADDL INFO.
2. S.W. No.1= NEW SHEARWALL LOCATION.
3. ALL DIMENSIONS, EXIST CONDITIONS AND AS-BUILT CONDITIONS MUST BE VERIFIED IN THE FIELD. LOCATE NEW STEEL POST LOCATIONS TO AVOID IMPACTING EXIST JOISTS.
4. FOR ADDITIONAL INFORMATION ON EXIST BUILDING, SEE MUNJOY HILL NEIGHBORHOOD FACILITY AND FIRE STATION, PORTLAND, MAINE, DATED AUGUST 30, 1976.
5. NEW PROTECTIVE RUBBER MATS SHALL BE FIRESTONE DURODECK WALKWAY PADS (BLACK), OR APPROVED EQUAL. SUBMIT SHOP DWG & INSTALLATION PLAN. INSTALL THE WALKWAY PADS PER MANUFACTURES RECOMMENDATIONS. CONSULT WITH CITY PRIOR TO INSTALLATION.
6. NEW ROOF-TOP HOOD FOR CONDUIT. COORDINATE INSTALLATION WITH CITY OF PORTLAND COMMUNICATIONS CONSULTANT NORM BOUCHER PHONE # 603-905-9408. FOLLOW MANUFACTURERS INSTALLATION REQUIREMENTS AND PAINT SYSTEM REQUIREMENTS. COLOR SHALL MATCH EXISTING ROOF (FLAT BLACK). COLOR SAMPLE SHALL BE SUBMITTED TO OWNER PRIOR TO FABRICATION FOR APPROVAL. PROVIDE ONE OF THE FOLLOWING HOODS OR APPROVED EQUAL:

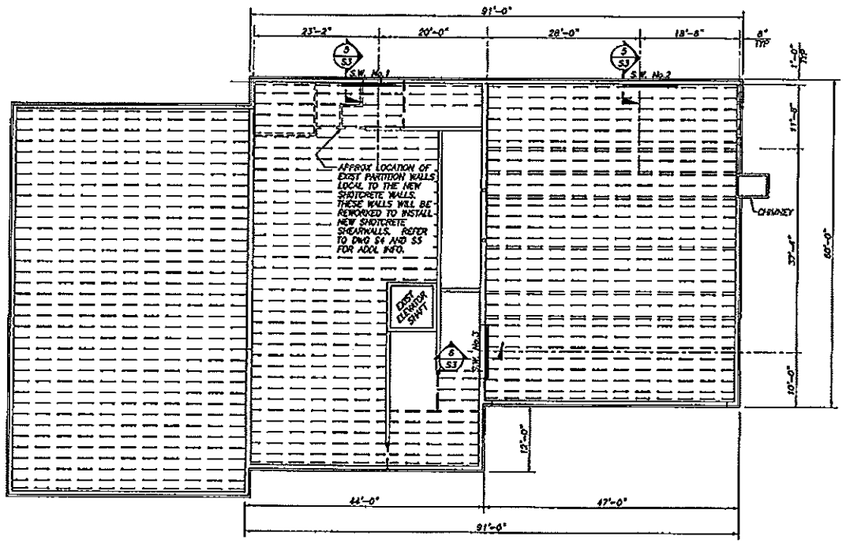
1. CONNECT-IT:	C14-3SS	(1 UNIT)
	EM-C4	(1 UNIT)
	EM-C4	(16 UNITS)
2. SITEPRO-1:	SP3850	(1 UNIT)
	E1447	(1 UNIT)
	E-C7	(16 UNITS)

STEEL PROCUREMENT:

1. FOR SCHEDULE CONSIDERATIONS, THE CITY WILL PROCURE MAJOR STRUCTURAL STEEL ELEMENTS INCLUDING BEAMS, BRACES, AND POSTS. THESE MATERIALS WILL BE DELIVERED TO THE SELECTED CONTRACTOR'S FABRICATOR; COORDINATION OF DELIVERY TIMING BY THE SELECTED CONTRACTOR.
2. CONTRACTOR'S FABRICATOR WILL PROVIDE SHOP DRAWINGS, ERECTION PLANS, MISC. METAL PLATES AND ANGLES, RESPONSIBLE FOR SHOP PAINTING AND INSTALLATION.
3. THE SUPPLIER SHALL PROVIDE A COPY OF THE CERTIFIED MILL TEST REPORTS FOR ALL MATERIAL TO THE STRUCTURAL ENGINEER.
4. THE FOLLOWING IS A LIST OF THE STEEL PROCURED BY THE CITY OF PORTLAND:

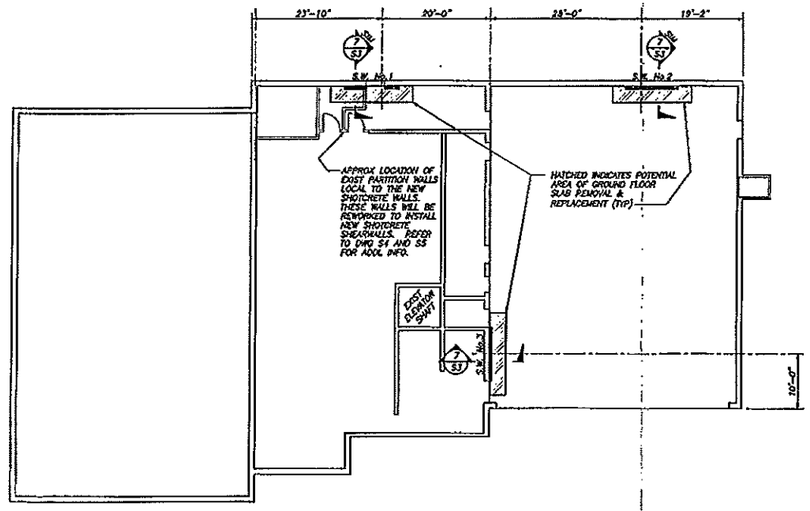
DESC.	QUANTITY	LENGTH (FEET)
W24x162	2	55
W24x162	2	30
HSS10.4x1/4	1	33
HSS10.4x1/4	1	30
HSS10.4x1/4	2	23
HSS10.4x1/4	2	15
#10x18	1	15
8"ø EXTRA STRONG PIPE	1	15

PROJECT NORTH



EXIST SECOND FLOOR FRAMING PLAN

3/32=1'-0"



EXIST GROUND FLOOR PLAN

3/32=1'-0"

BECKER
ENGINEERS
29 Fore Street, Portland, Maine 04101
207.879.3366 • beckerengineers.com

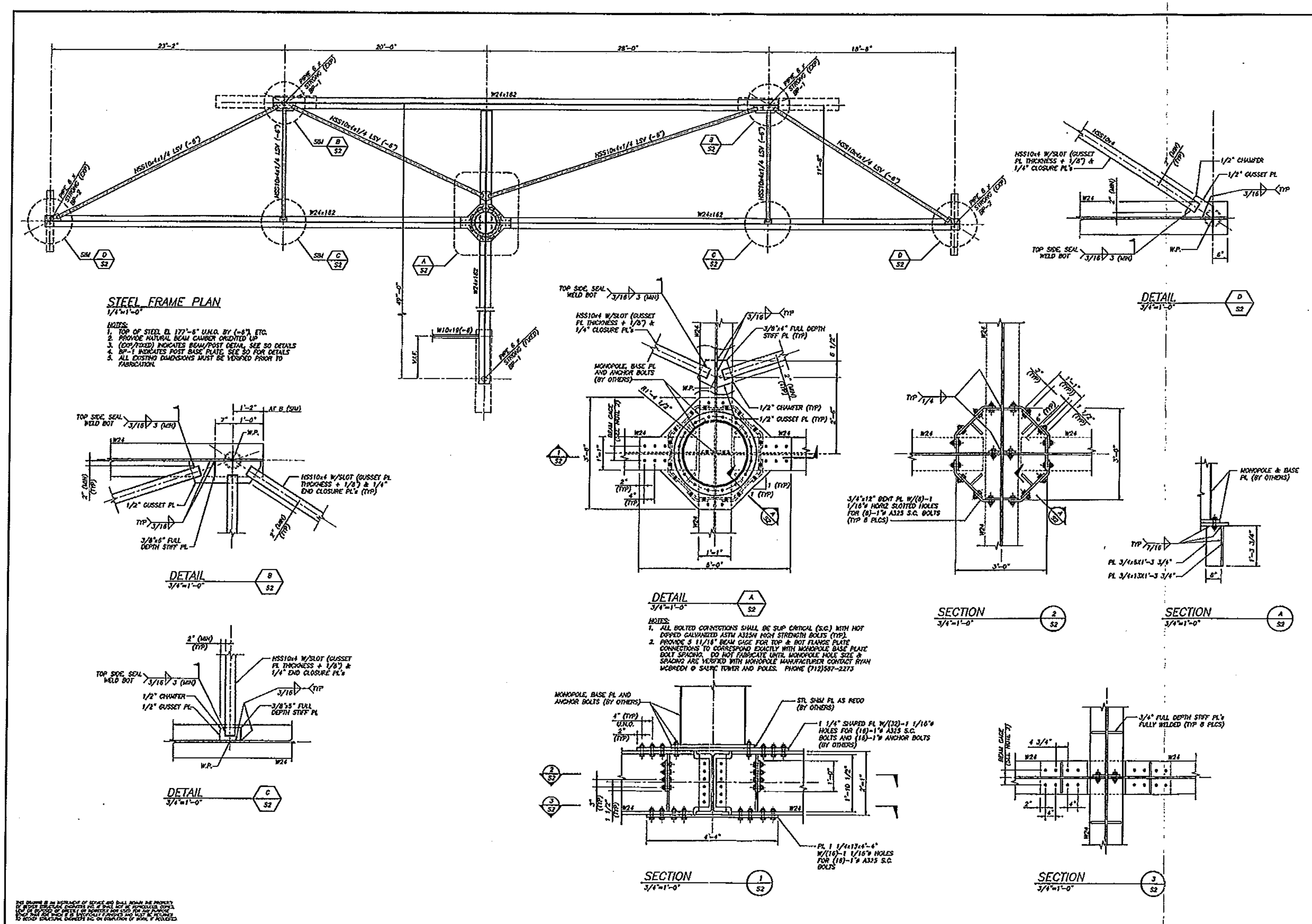
STATE OF MAINE
BRYDON T. WELCH
No. 11746
REGISTERED PROFESSIONAL ENGINEER

Issued	
1	
2	
3	
4	

PFD MUNJOY HILL FIRE STATION
MONO-POLE INSTALLATION
PORTLAND, MAINE
FRAMING PLANS

Designed BTW	Scale NOTED
Drawn APP	Date 03/19/12
Checked PBB	Job # 2612

S1



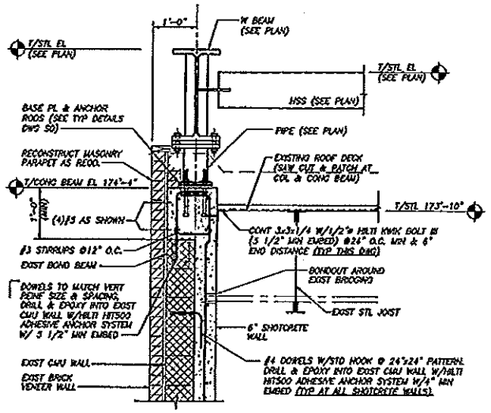
BECKER STRUCTURAL ENGINEERS

PFD MUNJOY HILL FIRE STATION
MONO-POLE INSTALLATION
PORTLAND, MAINE

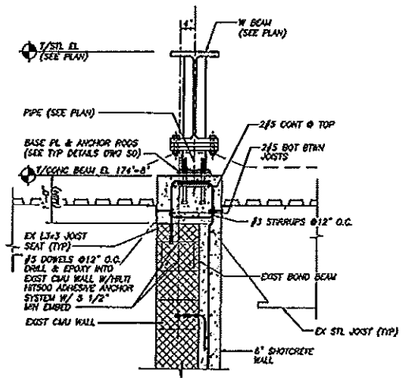
FRAME PLAN, SECTIONS & DETAILS

Designed BTW	Scale NOTED
Drawn APP	Date 03/19/12
Checked PSG	Becker Job Number 2612

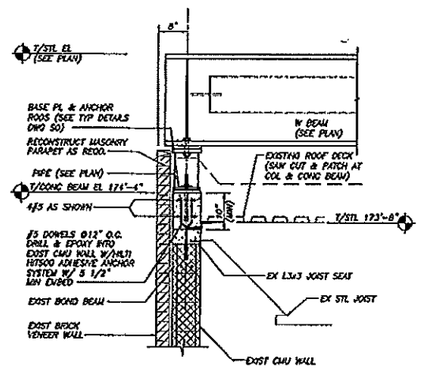
S2



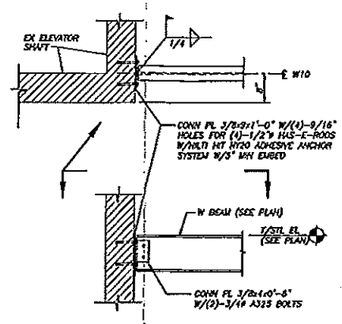
SECTION 1 / S1
3/4"=1'-0"



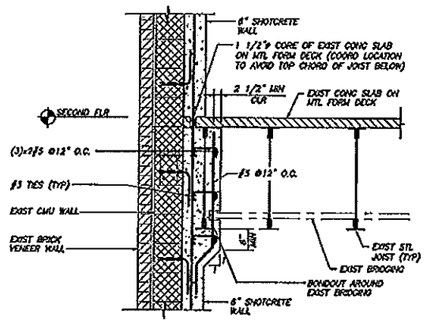
SECTION 2 / S1
3/4"=1'-0"



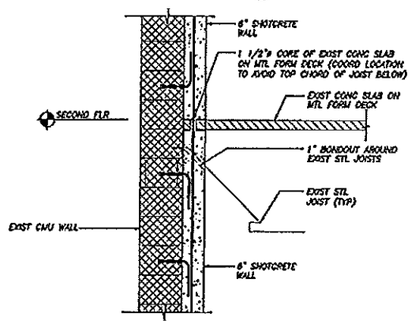
SECTION 3 / S1
3/4"=1'-0"



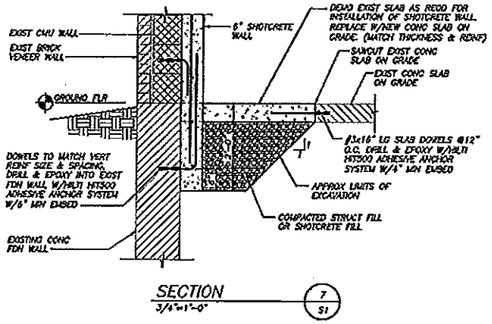
SECTION 4 / S1
3/4"=1'-0"



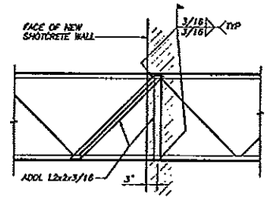
SECTION 5 / S1
3/4"=1'-0"



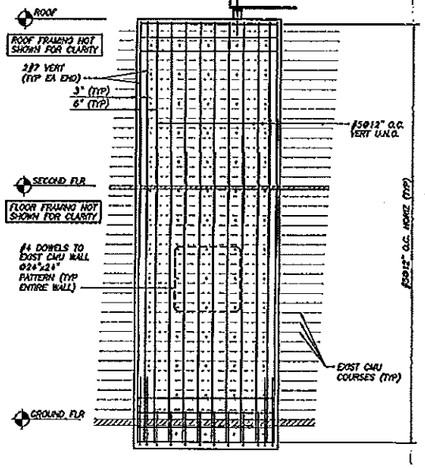
SECTION 6 / S1
3/4"=1'-0"



SECTION 7 / S1
3/4"=1'-0"



TYP EXIST JOIST REINF DETAIL @ SHOTCRETE WALL
8 / S4



TYPICAL 6" SHOTCRETE WALL ELEVATION
1/4"=1'-0"

NOTES:
1. SEE PLANS AND ELEVATIONS FOR LOCATIONS AND EXTENTS.
2. SEE SECTIONS AND DETAILS DWG S3, FOR ADDL INFO.
3. VERTICAL REBAR MATS SHALL BE LOCATED IN CENTER OF WALL THICKNESS.

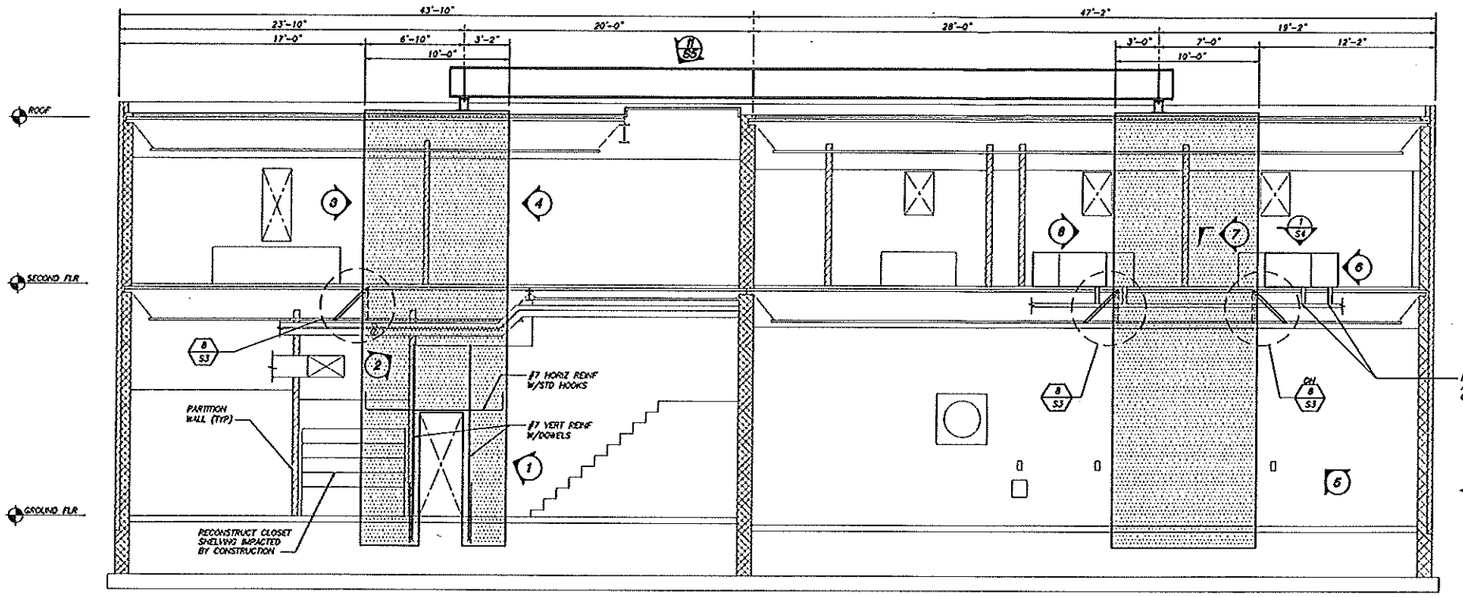
BECKER
STRUCTURAL ENGINEERS
75 Pitch Street, Portland, Maine 04101
(207)772-2515 • beckerstructural.com
STATE OF MAINE
BRYSON T. WELCH
No. 11796
REGISTERED PROFESSIONAL ENGINEER

Issue	Date
Issued For	
Mark	
Rev. No.	

PFD MUNJOY HILL FIRE STATION
MONO-POLE INSTALLATION
PORTLAND, MAINE
SECTIONS & DETAILS

Designed BTW	Scale NOTED
Drawn APP	Date 03/19/12
Checked PBB	Becker Job Number 2612

S3

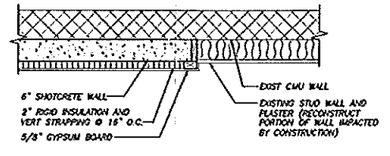


SHOTCRETE WALL NO. 1 ELEVATION
1/4"=1'-0"

SHOTCRETE WALL NO. 2 ELEVATION
1/4"=1'-0"

NOTES PERTAINING TO REWORK OF EXISTING WALLS, UTILITIES, ETC TO ACCOMMODATE NEW SHEARWALL

ALL REMOVALS, RELOCATION, REWORK OF EXISTING UTILITIES, FINISHES AND M.E.P. APPLIANCES AS INDICATED ON THE PLANS AND AS OBSERVED IN THE FIELD BY THE CONTRACTOR IN COURSE OF EXECUTION OF WORK SHALL BE COMPLETED IN ACCORDANCE WITH ALL APPLICABLE LOCAL, STATE, AND FEDERAL REQUIREMENTS, IN A MANNER CONSISTENT WITH INDUSTRY STANDARD OF CARE TO A CONDITION WHICH MEETS OR EXCEEDS EXISTING FIT, FINISH, AND FUNCTION.



SECTION 1/S4
3/4"=1'-0"

NOTES:
1. [SHOTCRETE] INDICATES NEW 6" SHOTCRETE WALL.
2. SEE DWG S3 FOR TYPICAL SHOTCRETE DETAILS & REINFORCING LAYOUT & DWG S5 FOR CONSTRUCTION SEQUENCE NOTES.
3. FOR ADDL INFO ON EXISTING BUILDING, SEE MUNJOY HILL NEIGHBORHOOD FACILITY AND FIRE STATION, PORTLAND MAINE DATED AUG. 30 1978.

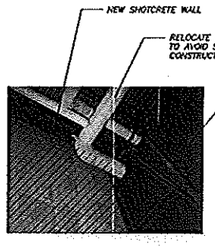
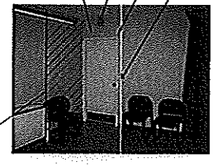


PHOTO – 2

PHOTO – 1



NEW SHOTCRETE WALL PHOTO – 3

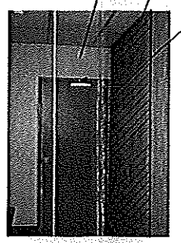


PHOTO – 4

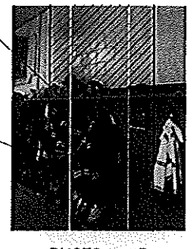


PHOTO – 5

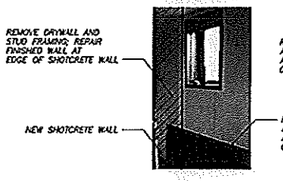


PHOTO – 6

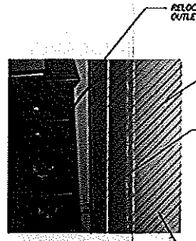


PHOTO – 7

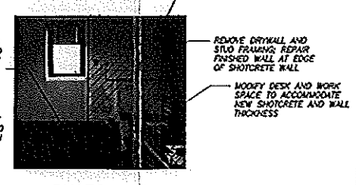


PHOTO – 8

BECKER
STRUCTURAL ENGINEERS
79 York Street, Portland, Maine 04101
207.871.1626 • beckerstructural.com

STATE OF MAINE
GREGORY T. WELCH
No. 11751
REGISTERED PROFESSIONAL ENGINEER

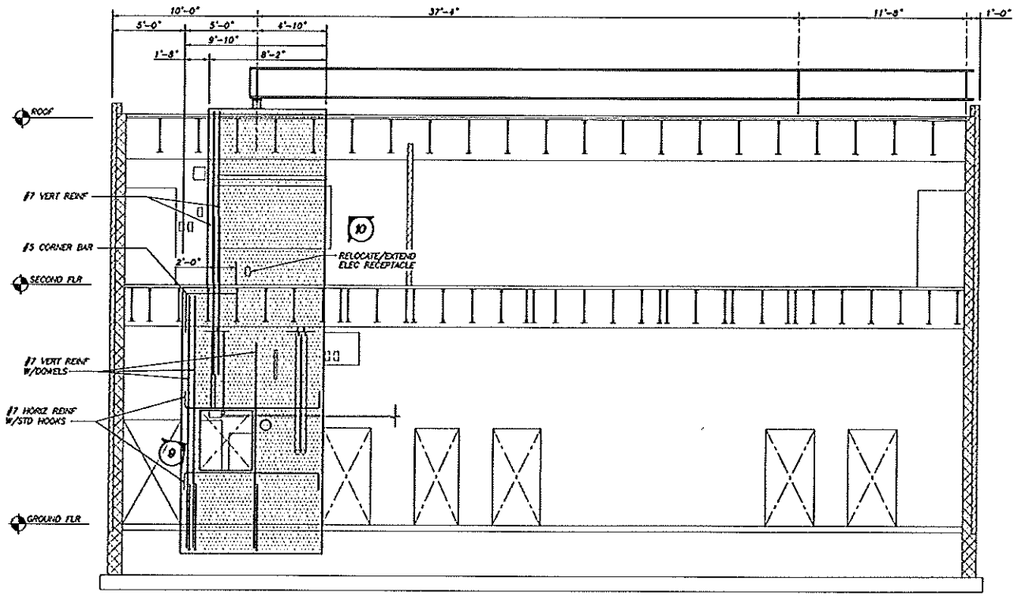
Issued	Date
1	
2	
3	

PFD MUNJOY HILL FIRE STATION
MONO-POLE INSTALLATION
PORTLAND, MAINE

SHOTCRETE WALL ELEVATIONS

Designed	Scale
BTW	NOTED
Drawn	Date
APP	03/19/12
Checked	Becker Job Number
PDB	2612

S4



SHOTCRETE WALL NOTES

1. SHOTCRETE WALLS SHALL HAVE A 28-DAY COMPRESSIVE STRENGTH OF 3,000 PSI.
2. THE CONTRACTOR SHALL SUBMIT COMPLETE SHOP DRAWINGS FOR ALL PARTS OF THE SHOTCRETE WALL CONSTRUCTION, INCLUDING DESCRIPTION OF CONSTRUCTION METHODS AND CONSTRUCTION SEQUENCING. NO PERFORMANCE OF THE WORK INCLUDING, BUT NOT LIMITED TO, DEMOLITION OF EXISTING STRUCTURE, OR FABRICATION OR ERECTION OF NEW STRUCTURAL ELEMENTS, SHALL COMMENCE WITHOUT REVIEW OF THE SHOP DRAWINGS BY THE STRUCTURAL ENGINEER.
3. PROVIDE A SMOOTH GUN FINISH TO SURFACE OF SHOTCRETE WALLS. A MOCK-UP SHALL BE PROVIDED DURING THE FIRST PLACEMENT TO VERIFY SHOTCRETE WALL FINISH.
4. REMOVE AND RECONSTRUCT CEILING TILE, LIGHTS, FLOOR FINISHES AND WALL FINISHES TO MATCH EXISTING WHERE IMPACTED BY CONSTRUCTION.

SHOTCRETE CONSTRUCTION SEQUENCE NOTES

1. SHOTCRETE WALLS ARE TO BE CONSTRUCTED FROM THE LOWEST LEVEL AND CONTINUE UP THE BUILDING.
2. RELOCATE OR PROVIDE TEMPORARY SUPPORT FOR EXISTING MECHANICAL EQUIPMENT.
3. SAW CUT AND DEMO EXISTING CONCRETE SLAB ON GRADE.
4. EXCAVATE TO NEW BOTTOM OF SHOTCRETE WALL ELEVATION.
5. REMOVE FLOOR FINISHES FROM THE EXISTING SECOND FLOOR CONCRETE SLAB. MECHANICALLY REMOVE PAINT FROM THE CMU BLOCK WALL.
6. DRILL AND EPOXY REINFORCEMENT INTO EXISTING FOUNDATION AND CMU BLOCK WALL AS SHOWN.
7. CORE HOLES FOR VERTICAL REINFORCING IN EXISTING FLOOR SLAB ABOVE.
8. INSTALL REINFORCING FOR SHOTCRETE WALL AND FORM AROUND EXISTING MECHANICAL THAT HAS NOT BEEN RELOCATED.
9. FORM AND PLACE SHOTCRETE WALL TO BOTTOM OF FLOOR SLAB ABOVE.
10. BACKFILL EXCAVATION WITH STRUCTURAL FILL OR FLOWABLE FILL.
11. CONSTRUCT SLAB ON GRADE.
12. REPEAT STEPS AS REQUIRED FOR SHOTCRETE WALLS ON SECOND FLOOR ABOVE.
13. SHOTCRETE CONSTRUCTION SEQUENCE NOTES ARE FOR REFERENCE ONLY. G.C. TO SUBMIT CONSTRUCTION SEQUENCE PLAN FOR REVIEW BY STRUCTURAL ENGINEER PRIOR TO COMMENCEMENT OF WORK.

SHOTCRETE WALL NO. 3 ELEVATION

1/4"=1'-0"

NOTES:
1. [redacted] INDICATES NEW 6" SHOTCRETE WALL.
2. SEE DWG S3 FOR TYPICAL SHOTCRETE DETAILS & REINFORCING LAYOUT & THIS DWG FOR CONSTRUCTION SEQUENCE NOTES.
3. FOR ADDL INFO ON EXISTING BUILDING, SEE MUNJOY HILL NEIGHBORHOOD FACILITY AND FIRE STATION, PORTLAND MAINE DATED AUG. 30 1976.
4. SEE DWG S4 FOR NOTES PERTAINING TO REWORK OF EXISTING WALLS, UTILITIES, ETC.

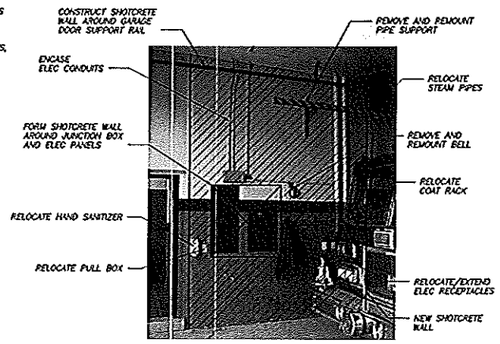


PHOTO – 9

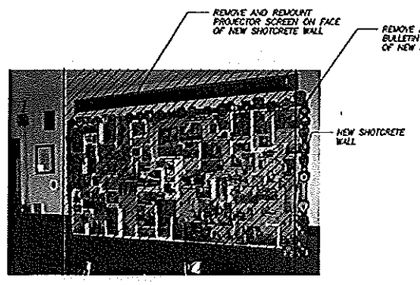


PHOTO – 10

PHOTO – (11/S4)

BECKER STRUCTURAL ENGINEERS
75 York Street, Portland, Maine 04101
207.879.3333 • beckerstructural.com

STATE OF MAINE
BRYSON T. WELCH
No. 11791
REGISTERED PROFESSIONAL ENGINEER

Issue	Date
Issued For	

PDF MUNJOY HILL FIRE STATION
MONO-POLE INSTALLATION
PORTLAND, MAINE

SHOTCRETE WALL ELEVATIONS

Designed	Scale
BTW	NOTED
Drawn	Date
APP	03/19/12
Checked	Becker Job Number
PBB	2612

S5