P r o j e c t M a n u a l

Oak Street Efficiencies

a new 37 Unit Apartment Building in Portland, Maine

Issued October 25th, 2010: 100% Pricing and Permitting

BOOK 1 – BIDDING AND CONTRACT DOCUMENTS MANUAL

Development Team

Avesta Oak Street LP
c/o **Avesta Housing**
307 Cumberland Avenue
Portland, ME 04101

Owner
Phone: 207.553.7780 Fax: 207.553.7778

LEED Consultant

Fore Solutions
386 Fore Street, Suite 401
Portland, Maine 04101
Phone: 207.347.5066
Fax: 207. 347.6039

MaineHousing
353 Water Street
Augusta ME 04330-4633

Financer
Phone: 207.626.4600 Fax: 207.626.4679

CWS Architects
434 Cumberland Avenue
Portland ME 04101-2325

Architect
Phone: 207.774.4441 Fax: 207.774.4016

Landscape Architect

Mitchell & Associates
70 Center Street
Portland, Maine 04101
Phone: 207.774.4441
Fax: 207. 8742.460

Structural Engineer

Becker Structural Engineers
75 York Street
Portland, Maine 04101
Phone: 207.879.1838
Fax: 207.879.1822

Mechanical and Electrical Engineer

Bennett Engineering
P.O. Box 297
Freeport ME 04032
Phone: 207.865.9475
Fax: 207.865.1800

Wright Ryan Construction
10 Danforth Street
Portland, ME 04102-0911

Construction Manager
Phone: 207.773.3625 Fax: 207.773.5173

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Issue Date: OCTOBER 25, 2010

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C. Supplemental Report on Subsurface and Foundation Investigation – Prepared by Sebago Technics, March 5, 2010
D. Phase I Environment Site Assessment – Executive Summary – Prepared by Dickerson & Associates, January, 2009
E. Statement of Special Inspections – Prepared by Becker Structural Engineers
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   2. Code Analysis – IBC 2003 and NFPA 2003, 3 pages.
   3. International Building Code 2003 – Code Calculations, 4 pages.
I. Portland Water District - Water and Sewer Construction Specifications and Procedures

1.4 By reference, available upon request:

A. MaineHousing – Construction Services Manuals
B. MaineHousing – Green Building Standards
C. Phase I Environment Site Assessment – Complete Report – Prepared by Dickerson & Associates, January, 2009

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00 52 24 Agreement Form - AIA Construction Management (Single-Prime Contract)
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NOTICE OF SOLICITATION OF SUBCONTRACTOR BIDS

June 11, 2010

TO: BUILDING TRADE SUBCONTRACTORS
RE: OAK STREET EFFICIENCIES

The **Avesta Oak Street LP** announce the commencement of the solicitation of subcontractor bids for the construction of the above referenced project and has authorized **Wright Ryan Construction** to act as Construction Manager (CM). **Oak Street Efficiencies** is a new 37 unit apartment building that will be construction in downtown Portland, Maine. Subcontractors interested in submitting a bid shall contact Wright Ryan Construction and refer to additional bidding instructions as may be provided by Wright Ryan Construction at the following address:

Wright Ryan Construction
10 Danforth St., Portland, ME 04101
Phone: (207) 773-3625, Fax: (207) 773-5173

Attention: Rick Bergeron
rbergeron@wright-ryan.com

PROJECT SCOPE: The work for this project generally consists of the wholesale building renovations and addition to the existing historic building with a comprehensive work scope identified in the plans and specifications.

Please note the following:

- The Construction Manager is directed to solicit a minimum of three (3) or more bids for each trade and to prepare a summary of bids for review, selection and approval by Owner, Architect and vested interests.
- Subcontractors bids shall be based the Contract Documents dated **October 25, 2010** as may be amended prior to the bid date by addenda issued by the Architect.
- For subcontractors interested in visiting the site prior to bidding, the Construction Manager will establish a schedule of pre-bid site walk opportunities as part of separate CM issued instructions.
- Subcontractor bids will be solicited by Wright Ryan Construction (the Construction Manager) who will establish the date and time for the receipt of bids as part of separate CM issued instructions.
- This notice to solicit subcontractor bids by the Construction Manager is not to be construed as an offer which can be accepted by submitting a bid. The **Avesta Oak Street LP** reserves the right to reject any and all bids, with or without cause, to negotiate with any person both before and after bids are submitted, to modify its specifications at any time, to accept any bid regardless of price and regardless of whether a bid complies with the terms of the bid request or instructions contained in this letter or in the instructions to bidders in the project manual, to disclose the bids and other information concerning bids to any person at any time to use bid information submitted to it for any purpose.
- In addition to the subcontractor bids, bids for alternates and unit prices may be required to be included with your bid. Refer to Basic Requirements (all Sections in Division 1) for additional information.
- The bidding process will be administrated under AIA A133 2009 (Standard Form of Agreement between Owner and Construction Manager where the Construction Manager is also the Constructor). The Construction Manager and all subcontractors shall consider this in their bids. For the sake of clarity, all references to either the Construction Manager (CM) or Contractor shall be the same. Refer to the Contract Documents for additional information.
- Refer to Instructions to Construction Manager and Bidding Subcontractors for additional information.

DOCUMENT 00 11 00

INSTRUCTIONS TO CONSTRUCTION MANAGER (CM)
AND BIDDING SUB-CONTRACTORS

1. RECEIPT AND OPENINGS OF BIDS

A. Subcontractor bids for construction of the **Oak Street Efficiencies** will be solicited and delivered to the offices of:

Wright Ryan Construction
10 Danforth St., Portland, ME 04101
Phone: (207) 773-3625, Fax: (207) 773-5173

Attention: Rick Bergeron
rbergeron@wright-ryan.com

where they will be reviewed and compiled by the Construction Manager on behalf of the Owner. The Construction Manager will establish the date and time for the receipt of bids as part of separate CM issued instructions.

2. PREPARATION OF CONSTRUCTION MANAGER AND SUBCONTRACTOR PROPOSALS

A. Subcontractors interested in submitting a bid shall contact Wright Ryan Construction (the Construction Manager) and refer to additional bidding instructions provided by Wright Ryan Construction.

B. In reviewing bids, the Construction Manager has been authorized to secure subcontractor information that may include, but not limited to, such items as previous relative experience, work load and availability, crew size, references, stipulated insurances, and/or financial capacity to complete the work, etc. This information will be reviewed by the CM, Owner, Architect and other vested interests to qualify submitted bids. The owner reserves the right to accept or reject any or all bids. The owner reserves the right to accept or reject any or all bids, regardless of price and regardless of whether a bid complies with the terms of the bid request or instructions. The notice of solicitation for bids shall not be construed as an offer that can be accepted by submission of a bid.

C. Upon receipt of subcontractor bids, the Construction Manager will provide to the Owner, Architect and other vested interests a summary of subcontractor bids for review and, following said review and selection, enter into an AIA A133 - 2009 (Standard Form of Agreement between Owner and Construction Manager where the Construction Manager is also the Constructor) with the **Avesta Oak Street LP** Selected subcontractors will be bound to the terms of Construction Documents via the Construction Manager's standard subcontractor agreement (available from the CM upon request).

3. BID DOCUMENTS

A. Full and complete sets of drawings and specifications, in a combination of paper and/or electronic (PDF) format will be available from and distributed by Wright Ryan Construction. A log of plan holders will be maintained by Wright Ryan Construction, upon distribution of all plans and specifications. Bidders will be notified by the Construction Manager of all future communications, including addenda, which will be distributed by Wright Ryan Construction. It is the subcontractors' responsibility to coordinate inclusion on the plan holder log.

4. ADDENDA AND INTERPRETATION

A. No interpretation of the meaning of the plans, specifications, or other contract documents

will be made orally to any bidder. Each request for information or interpretation is suggested to be in writing on an attached RFI Form and sent to Wright Ryan Construction, who will in turn forward appropriate RFIs to the Architect for interpretation. Responses will be provided by the Architect to the CM in the form of either a) an RFI response if for clarification only, or b) an Addendum if the response results in a change of scope. Requests should be made in writing, via FAX or EMAIL to:

Wright Ryan Construction
PO Box 911 Bangor, ME 04402-0911
Phone: (207) 989-7400, Fax: (207) 989-7548

Attention: Bill Boulier
bboulier@nickoday.com

and to be given consideration must be received at least three (3) business days prior to the date fixed for the opening bids. Any and all responses that change the scope of work will be in the form of written addenda to the plans and specifications prepared by the Architect which, if issued, will be made available to all registered bidders on the plan holder log by means of a NOTICE by the Construction Manager no later than two (2) days prior to the date fixed for submission of bids. Failure of any bidder to receive any such addenda or interpretation shall not relieve any bidder from any obligation under his bid as submitted. All addenda so issued shall become part of the contract documents. It is the responsibility of the bidder to verify extent of all Addenda from the Construction Manager.

These instructions or the notice to solicit subcontractor bids by the Construction Manager is not to be construed as an offer which can be accepted by submitting a bid. **Avesta Oak Street LP** reserves the right to reject any and all bids, with or without cause, to negotiate with any person both before and after bids are submitted, to modify its specifications at any time, to accept any bid regardless of price and regardless of whether a bid complies with the terms of the bid request or instructions contained in this letter or in the instructions to bidders in the project manual, to disclose the bids and other information concerning bids to any person at any time to use bid information submitted to it for any purpose.

5. CONSTRUCTION BONDS

A. Construction Manager: 100% Performance Bond and Payment Bond

6. DAYS AND HOURS OF WORK

A. The CM shall coordinate with the Owner and the local municipality regarding the hours of work and shall make such arrangements with his employees as not to conflict with the Wage and House Laws of the State and the United States of America. Be it further understood that, if in the opinion of the Owner and Architect, the work is not progressing fast enough to insure completion by the date set, the Contractor will be required to work such additional shifts and overtime as, in the opinion of the Owner and the Architect, is necessary to complete the work on the required date without extra cost to the Owner.

7. OBLIGATION OF BIDDERS

A. At the time of submitting subcontractor bids, each bidder will be presumed to have inspected the site and to have read and to be thoroughly familiar with the Plans, Specifications and Contract Documents (including all addenda). The failure or omission of any bidder to receive or examine any form, instrument, or documents shall in no way relieve any bidder from any obligation in respect to his bid. The bidder also is assumed to have reviewed the various installation requirements.

8. TIME OF COMPLETION

A. The Construction Manager shall prosecute the work continuously until completion. The rate of progress shall be at least that shown on the Schedule of Progress which shall not be less that that indicated below.

B. Schedule for Construction: To be provided to bidding subcontractors by the Construction Manager.

9. LIQUIDATED DAMAGES

A. The **Avesta Oak Street LP** anticipates a construction start date of approximately during the month of **January of 2011** (plus or minus a few weeks) and a substantial completion date following issuance of a notice to proceed will be established by the Owner and Construction Manager. Liquidated Damages will be charged if construction is not complete by the contractually stipulated completion date. Winter conditions should be assumed based on this construction schedule and bidding subcontractors should coordinate this schedule with the Construction Manager.

10. SPECIAL CONSIDERATIONS

A. **State of Maine Wage Rates** – The construction of this project **WILL** be governed by State of Maine 2009 Fair Minimum Wage Rates. **Refer to specification Section 00 31 00 item 3.1 for more information.**

B. **Avesta Oak Street LP** is NOT a tax exempt organization. All bids shall **INCLUDE** applicable sales tax.

C. **Builders' Risk Insurance** – The Construction Manager shall exclude the cost of Builders' Risk insurance in the Guaranteed Maximum Price and, if requested, provide a separate itemized cost for consideration of value by the owner. The owner reserves the right to purchase Builder's Risk insurance from the contractor in place of that carried by the by the **Avesta Oak Street LP** and increase the contract sum accordingly.

D. **Requests for Substitution** - The owner will NOT entertain REQUESTS FOR SUBSTITUTIONS in the initial bid process. Should additional cost savings and value engineering be required after bids are received, the owner may entertain or solicit Requests for Substitutions with apparent low bidders with the intent of arriving at an acceptable contract sum and execution of a construction contract.

E. **Avesta Oak Street LP** intends to enter into a construction management contract with the construction manager. The Construction Manager will be required to submit monthly itemized Transaction Reports, in lieu of submitting monthly itemized paper invoices, so as to support Construction Manager's monthly requisitions with the understanding that all monthly invoices be maintained by the Construction Manager and be made available in whole or in part upon request. The construction contract will include a retainage equal to 10% of the construction contract cost and may be reduced at the owner's discretion when the amount of retainage equals 5% of the phase's contract value, including any subsequent change orders. The retainage will be reduced to 0% upon the completion of the project as determined by the owner and architect.

F. **Panelized Construction Submittal Review** – If the Contractor chooses to construct the building or a portion thereof utilizing a panelized method of wood framing, the contractor shall carry the cost of panel shop drawing review as stipulated in specification Section 06 10 00 Rough Carpentry.

G. **AIA 2030 Challenge** – Funding sources for this project require the building to meet the AIA 2030 Challenge. Special care shall be taken to implement the scope of work in conformance with the requirement of the AIA 2030 Challenge.

H. **LEED Certification** – This project is targeted to achieve LEED Silver certification based on LEED for Homes Midrise Pilot program. Special care shall be taken to implement the scope of work in conformance with the requirement of the LEED program stipulated in specification Section 01 81 13 SUSTAINABLE DESIGN REQUIREMENTS.

END OF SECTION

00 12 00

BIDDING SUB-CONTRACTOR REQUEST FOR INFORMATION FORM

Oak Street Efficiencies
Portland, Maine

Each request for information or interpretation is suggested to be in writing on an attached RFI Form and sent to Wright Ryan Construction, who will in turn forward appropriate FRIs to the Architect for interpretation. Responses will be provided by the Architect to the CM in the form of either a) an RFI response if for clarification only, or b) an Addendum if the response results in a change of scope. Requests should be made in writing, via FAX or EMAIL to:

Wright Ryan Construction
10 Danforth St., Portland, ME 04101
Phone: (207) 773-3625, Fax: (207) 773-5173

Attention: Rick Bergeron
rbergeron@wright-ryan.com

Organization Requesting Information: _____ (Name)

_____ (Fax or Email)

Topic: _____ **Date:** _____

Request for Information:

_____

_____

_____

_____

_____

_____

Response:

_____

_____

_____

_____

_____

_____

_____

Responses that change the Scope of Work will be via Addenda as noted in the Instructions to CM and Bidding Subcontractors.

DOCUMENT 00 31 00

AVAILABLE PROJECT INFORMATION

1.1 REQUISISTION DOCUMENTS

A. AIA Document G701 – 2001 Change Order Form

B. AIA Document G702 - 1992 Application and Certificate for Payment

C. AIA Document G703 - 1992 Continuation Sheet

1.2 MAINEHOUSING DOCUMENTS

A. MaineHousing Contract Requirements

B. MaineHousing Contractor Standards

C. MaineHousing Program Affirmative Action Plan

D. MaineHousing On the Job Training Program Guidelines

E. MaineHousing Contractor Health Standards Form

F. MaineHousing Contractor's Final Certificate and Lien Release

G. MaineHousing Incomplete Work Escrow Agreement

H. MaineHousing Certificate of Completion Owner Agency

I. MaineHousing Certificate of Completion Design Professional

J. MaineHousing Construction Services Final Completion Checklist

K. MaineHousing Insurance Checklist

L. MaineHousing MaineHousing Survey Requirements

M. MaineHousing Preconstruction Doc Review Worksheet

N. MaineHousing Survey Minimum Standards

1.3 MISCELLANEOUS DOCUMENTS

A. State of Maine DOL 2010 Fair Minimum Wage Rates – Cumberland County
   1. See attached Maine DOL 2010 Fair Minimum Wage Rates, Building 2

B. Report on Subsurface and Foundation Investigation – Prepared by Sebago Technics, April 3, 2007
   1. This report identifies properties of below grade conditions, prepared primarily for the use of the Architect/Engineer and Contractors.

2. These reports, by their nature, cannot reveal all conditions that exist on the site. Should subsurface conditions be found to vary substantially from this report, changes in the design and construction of foundations may be considered so as to address any concerns, with resulting credits or expenditures to the Contract Price/Sum accruing to the Owner. The contractor shall work with the Owner toward expeditious resolution of any unforeseen site issues.

C. Supplemental Report on Subsurface and Foundation Investigation – Prepared by Sebago Technics, March 5, 2010

D. Phase I Environment Site Assessment – Executive Summaries – Prepared by Dickerson & Associates, January, 2009

E. Statement of Special Inspections – 15 pages, dated August 18, 2010, prepared by Becker Structural Engineers.

F. Sample Construction Sign - (1) 48x96 Construction Signs on Luster Board. See specification 10 14 00. Actual sign layout and design to be based on review and approval of Owner.

G. Water Pressure Flow Test

H. NFPA and IBC Code Studies
1. PRINCLIPAL Codes, Standards and Review Authorities Applicable to Project, 1 page.
2. Code Analysis – IBC 2003 and NFPA 2003, 3 pages.
3. International Building Code 2003 – Code Calculations, 4 pages.

I. Portland Water District - Water and Sewer Construction Specifications and Procedures, Latest Revision: February 1, 2009

1.4 BY REFERENCE, AVAILABLE UPON REQUEST

A. MaineHousing – Construction Services Manuals
1. Design and Construction Manual: (http://www.mainehousing.org/Documents/HousingDevelopments/2009ConstructionServicesManual.pdf)

B. MaineHousing – Green Building Standards
1. Green Building Standards: (http://www.mainehousing.org/Documents/HousingDevelopments/2008GreenBuildingStandards.pdf)

C. Phase I Environment Site Assessment – Complete Report - Prepared by Dickerson & Associates, January, 2009

END OF DOCUMENT

AIA® Document G701™ – 2001

Change Order

PROJECT *(Name and address)*:

CHANGE ORDER NUMBER:
DATE:

OWNER: ☐
ARCHITECT: ☐
CONTRACTOR: ☐
FIELD: ☐
OTHER: ☐

TO CONTRACTOR *(Name and address)*:

ARCHITECT'S PROJECT NUMBER:
CONTRACT DATE:
CONTRACT FOR:

THE CONTRACT IS CHANGED AS FOLLOWS:
(Include, where applicable, any undisputed amount attributable to previously executed Construction Change Directives)

The original Contract Sum/Guaranteed Maximum Price was	$ _____
The net change by previously authorized Change Orders	$ _____
The Contract Sum/Guaranteed Maximum Price prior to this Change Order was	$ _____
The Contract Sum/Guaranteed Maximum Price will be increased/decreased/unchanged by this Change Order in the amount of	$ _____
The new Contract Sum/Guanteed Maximum Price including this Change Order will be	$ _____

The Contract Time will be increased/decreased/unchanged by _____ (___) days.
The date of Substantial Completion as of the date of this Change Order therefore is _____

NOTE: This Change Order does not include changes in the Contract Sum, Contract Time or Guaranteed Maximum Price which have been authorized by Construction Change Directive until the cost and time have been agreed upon by both the Owner and Contractor, in which case a Change Order is executed to supersede the Construction Change Directive.

NOT VALID UNTIL SIGNED BY THE ARCHITECT, CONTRACTOR AND OWNER.

ARCHITECT *(Firm name)*	CONTRACTOR *(Firm name)*	OWNER *(Firm name)*
ADDRESS	ADDRESS	ADDRESS
BY *(Signature)*	BY *(Signature)*	BY *(Signature)*
(Typed name)	*(Typed name)*	*(Typed name)*
DATE	DATE	DATE

AIA® Document G702™ – 1992

Application and Certificate for Payment

TO OWNER:	**PROJECT:**	**APPLICATION NO:**	**Distribution to:**
		PERIOD TO:	OWNER: ☐
		CONTRACT FOR:	ARCHITECT: ☐
FROM CONTRACTOR:	**VIA ARCHITECT:**	**CONTRACT DATE:**	CONTRACTOR: ☐
		PROJECT NOS: / /	FIELD: ☐
			OTHER: ☐

CONTRACTOR'S APPLICATION FOR PAYMENT

Application is made for payment, as shown below, in connection with the Contract.
Continuation Sheet, AIA Document G703, is attached.

1. **ORIGINAL CONTRACT SUM** ..... $ _____
2. **Net change by Change Orders** ..... $ _____
3. **CONTRACT SUM TO DATE** (Line 1 ± 2) ..... $ _____
4. **TOTAL COMPLETED & STORED TO DATE** (Column G on G703) ..... $ _____
5. **RETAINAGE:**
   a. _____% of Completed Work (Column D + E on G703) $ _____
   b. _____% of Stored Material (Column F on G703) $ _____
   Total Retainage (Lines 5a + 5b or Total in Column I of G703) ..... $ _____
6. **TOTAL EARNED LESS RETAINAGE** ..... $ _____
   (Line 4 Less Line 5 Total)
7. **LESS PREVIOUS CERTIFICATES FOR PAYMENT** ..... $ _____
   (Line 6 from prior Certificate)
8. **CURRENT PAYMENT DUE** ..... $
9. **BALANCE TO FINISH, INCLUDING RETAINAGE**
   (Line 3 less Line 6) $ _____

CHANGE ORDER SUMMARY	ADDITIONS	DEDUCTIONS
Total changes approved in previous months by Owner	$	$
Total approved this Month	$	$
TOTALS	$	$
NET CHANGES by Change Order	$	

The undersigned Contractor certifies that to the best of the Contractor's knowledge, information and belief the Work covered by this Application for Payment has been completed in accordance with the Contract Documents, that all amounts have been paid by the Contractor for Work for which previous Certificates for Payment were issued and payments received from the Owner, and that current payment shown herein is now due.

CONTRACTOR:

By: _____ Date: _____

State of:

County of:

Subscribed and sworn to before me this day of

Notary Public:

My Commission expires:

ARCHITECT'S CERTIFICATE FOR PAYMENT

In accordance with the Contract Documents, based on on-site observations and the data comprising this application, the Architect certifies to the Owner that to the best of the Architect's knowledge, information and belief the Work has progressed as indicated, the quality of the Work is in accordance with the Contract Documents, and the Contractor is entitled to payment of the AMOUNT CERTIFIED.

AMOUNT CERTIFIED ..... $ _____

(Attach explanation if amount certified differs from the amount applied. Initial all figures on this Application and on the Continuation Sheet that are changed to conform with the amount certified.)

ARCHITECT:

By: _____ Date: _____

This Certificate is not negotiable. The AMOUNT CERTIFIED is payable only to the Contractor named herein. Issuance, payment and acceptance of payment are without prejudice to any rights of the Owner or Contractor under this Contract.

AIA® Document G703™ – 1992

Continuation Sheet

AIA Document G702, APPLICATION AND CERTIFICATION FOR PAYMENT, containing Contractor's signed certification is attached.
In tabulations below, amounts are stated to the nearest dollar.
Use Column I on Contracts where variable retainage for line items may apply.

APPLICATION NO:
APPLICATION DATE:
PERIOD TO:
ARCHITECT'S PROJECT NO:

A	B	C	D	E	F	G		H	I
ITEM NO.	DESCRIPTION OF WORK	SCHEDULED VALUE	WORK COMPLETED		MATERIALS PRESENTLY STORED (NOT IN D OR E)	TOTAL COMPLETED AND STORED TO DATE (D+E+F)	% (G ÷ C)	BALANCE TO FINISH (C - G)	RETAINAGE (IF VARIABLE RATE)
			FROM PREVIOUS APPLICATION (D + E)	THIS PERIOD					
	GRAND TOTAL								

MaineHousing
Maine State Housing Authority

CONSTRUCTION SERVICES

CONTRACT REQUIREMENTS

1. The contract should reference the scope of work or plans, specs and addenda by the most recent revision date.
2. Contracts for large projects should contain a detailed schedule of values and unit prices.
3. The contract should specify a specific completion date or number of calendar days to complete the project.
4. The contract should specify amount and terms of liquidated damages and/or early completion bonus. The completion bonus should indicate a "cap amount" and should also indicate how the bonus is to be funded.
5. CM Contracts should contain Contractor/Owner shared savings clause.
6. The contract should specify that the owner will retain a percentage of the billed amount until the project is complete. The preferred retainage language is: "Retainage shall be 10% and may be reduced, at the owner's discretion with the approval of MaineHousing, when the amount of retainage equals 5% of the contract value (including change orders)."
7. A MaineHousing Construction Analyst must sign all change order proposals and change orders before they are a valid amendment to the contract.
8. The Contractor shall provide a list of Subcontractors with subcontracts in excess of $2,000.00 and Material Suppliers/Vendors with purchases in exceeding $10,000.00.

Contractor Standards

for

Maine Housing-Financed Multi-Family Housing

Project: AVESTA Oak Street Apartments
Location: Portland, Me

The following standards apply for this project:

1. Prevailing Wage Rates (2010 State of Maine Fair Minimum Wage Rates)
2. Employee Classification
3. Workers Compensation
4. Group Healthcare Coverage (80 % Level)
5. On-the-Job Training

MaineHousing
Maine State Housing Authority

353 Water Street Augusta, Maine 04330-4633 207.626.4600 800.452.4668 TTY 800.452.4603 FAX 207.626.4678
www.mainehousing.org

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www.mainehousing.org

General

Maine State Housing Authority (*MaineHousing)* has adopted the Contractor Standards for MaineHousing-Financed Multi-Family Housing (*MaineHousing Contractor Standards*). In general, these standards apply to projects financed under MaineHousing multifamily programs. The Contractor Standards applicable to a particular project are dependent on the requirements of the specific MaineHousing financing program.

This document summarizes the Contractor Standards for this project. A complete description of the Standards can be found in the *Contractor Standards Compliance Guide.* This guide can be downloaded from the MaineHousing web site at the link shown below.

http://www.mainehousing.org/HOUSINGDEVContractorStandards.aspx

The Contractor Standards applicable for this project include the following components of the MaineHousing Contractor Standards.

1. Prevailing Wage Rates

2. Proper Classification of Employees

3. Workers' Compensation Insurance

4 Group Healthcare Coverage

The contractors (including general contractors, construction managers, subcontractors, tier subcontractors, independent contractors and sole proprietors) are responsible for ensuring compliance with the MaineHousing Contractor Standards throughout the duration of the project. Contractors are independently responsible for complying with the MaineHousing Contractor Standards. The contractors shall cooperate with MaineHousing, its agents and employees, in monitoring and facilitating compliance with the MaineHousing Contractor Standards during the construction of the project.

The Contractor Standards Compliance Officer (CSCO) represents MaineHousing. The primary role of the CSCO is to monitor and facilitate compliance with the MaineHousing Contractor Standards. The CSCO will investigate potential violations and complaints and facilitate their resolution. The CSCO will cooperate fully with government agencies in resolving any issues concerning MaineHousing's contractor standards, either during the contract term or after construction.

Summary of Contractor Responsibilities During Construction

1. Prevailing Wage Rates

This project is subject to Davis Bacon wage rates

Contractor responsibilities during construction regarding the Prevailing Wage Rate standard are summarized below.

- Upon request by the CSCO, payrolls or other acceptable documentation showing compliance with the prevailing wage rates shall be submitted by all contractors (general contractor, subcontractors and tier subcontractors) who have employees working at the site. Payrolls are not required for salaried administration and management personnel.

- The payrolls can be in any format but must show as a minimum the employee, classification, hourly wage, regular hours and overtime hours. The payrolls do not need to be certified.

- Each contractor is responsible for his own payroll submittals. The general contractor is not responsible for subcontractor or tier subcontractor payroll submittals.

- Payrolls shall be submitted when requested by the CSCO. Payrolls can be weekly, bimonthly or monthly.

- Contractors shall cooperate with the CSCO during scheduled and unscheduled site inspections and on-site interviews with workers.

- Contractors shall participate in the investigation of violations and complaints relating to prevailing wage rates.

2. Proper Classification of Employees

Contractor responsibilities during construction regarding the Proper Classification of Employees standard are summarized below.

- Contractors who hire independent contractors (IC's) shall submit a list of all IC's working at the site upon request of the CSCO.

- Contractors who have applied to the State of Maine Workers Compensation Board for a predetermination of IC status shall submit a copy of the application. Copies of predetermination of IC status or waivers received from other agencies shall also be submitted.

- Contractors shall cooperate with the CSCO during unscheduled site inspections and on-site interviews with IC's.

3. Workers' Compensation Insurance

Contractor responsibilities during construction regarding the Workers' Compensation Insurance standard are summarized below.

- The general contractor shall submit copies of the certificates of coverage or other proof of workers' compensation insurance for all contractors working at the site upon request of the CSCO.

- Contractors who are excluded from having workers compensation insurance shall submit the reason for their exclusion.

- Contractors shall cooperate fully if referred by the CSCO to the Workers' Compensation Board for information or assistance.

4. Group Healthcare Coverage

Contractor responsibilities during construction regarding the Group Healthcare Coverage standard are summarized below.

- Upon request, the GC (or the Owner) should provide the CSCO with the list of contractors that pledged enrollment in an eligible group health insurance plan.

- All contractors enrolled in the group health coverage plan should submit documentation showing the terms of coverage for employees and dependents and the period the coverage will remain in effect.

- Contractors on the project not enrolled in the group healthcare coverage plan shall submit documentation showing the terms of coverage for employees and dependents.

Contractor Standards Compliance Officer (items 1 thru 4)
All submittals shall be sent to the CSCO. Questions relating to the MaineHousing Contractor Standards can be directed to the CSCO. The contact information is presented below.

Dan Brennan/Director of Development MaineHousing
353 Water St. Augusta, Maine 04330 phone: 626-4625
dbrennan@mainehousing.org

5. On-the-Job Training (Program Guidelines for the Developer/Owner)

The Developer or Owner of a MaineHousing financed multifamily housing project is responsible for assisting in the implementation of the MaineHousing On-the-Job Training program and the achievement of *Hourly Training Goals for Women and Minorities* set forth in the bid contract.
This requirement is outlined in **MaineHousing's Affirmative Action Plan** which can be found at:

http://www.mainehousing.org/Documents/QAP/2007QAPProgramAffirmativeActionPlan.pdf

The Role of the Developer/Owner

- To communicate the training commitment of the project to the General Contractor engaged in the project.

- To facilitate the Wage Support Fund. This fund will supplement investment in training with a five dollar an hour payment to Subcontractors participating in the OJT Program. OJT Training hours will be verified by the MaineHousing OJT Program Manager. At the completion of 700 hours, a report of job training results will be generated to the Developer/Owner, the Project Construction Analyst and the MaineHousing Loan Officer. Wage support reimbursement funds will be released by the MaineHousing Loan Officer to the Subcontractor following the receipt of an invoice. Only hours worked on the MaineHousing financed multifamily housing project will be approved for reimbursement.

  (Important note: For all multifamily housing projects which applied to MaineHousing between December 2, 2005 and November 1, 2007, the wage support fund is not required, but highly encouraged. For all multifamily housing projects which applied on November 1, 2007 and after, the wage support fund is required.

- To approve an OJT training plan created by the General Contractor,

- Subcontractors and the MaineHousing OJT Program Manager.

Project Training Plan

The Developer/Owner shall request that the General Contractor survey subcontractors engaged in the project to identify those with entry level job positions available. The OJT Program Manager will arrange a meeting the General Contractor and Subcontractors to create a project training plan. Early identification of the skill craft position (carpenter, painter, plumber, etc.) allows time to recruit the best candidates for training.

Entry level recruitment is essential to the future of the building industry.

- Building construction has a graying workforce and very few young people are entering construction as a career. New sources of recruitment and new faces have to be found.
- On-the-Job Training is a proven model that quickly integrates people into learning the construction skills necessary for earning a secure financial future.
- A bridge to community resources is built as recruitment channels are created for contractors.
- Diversity is an added value to any workplace.

MaineHousing On-the-Job Training adds the important values of construction skills training, income opportunity, and diversity to a construction project.

On-the-Job Training Program Procedures

Training Hour quantities are formulated by adding a value of 700 training hours for every $1, 000,000.00 dollars of the total construction cost for the project. For example, a 2100 hour training obligation would require three individual enrollments.

Each individual training registration will be in a Skilled Craft. The trainee and supervisor will receive an outline of skill sets to be covered throughout a *700 hour program.* All work hours will be applied as training hours.

Training is accomplished in the course of working and as the stages of a project progress. Direct trainers are requested to provide 3 to 5 hours a week in specific skill building.
Payroll records will be submitted to the On-the-Job Program Manager to document work hours.

The General Contractor must survey all Subcontractors to determine a current job listing by skill for the project. They will then outline an OJT Plan for the project identifying which trades and Subcontractors will be recruiting trainees. The OJT Program Manager will schedule a pre–construction meeting to assist in the development of a training plan for the project.
This OJT Plan must be submitted to the Developer/Owner and the OJT Program Manager for review and approval.

State of Maine Career Centers will assist in recruiting qualified women and minorities for construction. Recruiters are notified of job openings and have been advised of construction specific interview techniques. They can link with other job training programs that offer recent graduates, some with wage support dollars available.
State of Maine Career Centers are statewide and offer free services to the employer.
Training status is important to individuals new to construction. Training increases recruitment and retention. Recruiting motivated individuals and providing goals is the most important part of the OJT Program.

Contractors interview and select the trainee. The trainee is subject to all company policies and expected to fulfill every duty within the job description. Trainee wages will reflect the current state wage rate or Davis-Bacon, whichever applies to the project. Contractors provide wage statements to verify hours worked on the project.

A trainee may be enrolled in an upgraded training category three times. For example, a carpenter's helper may move up to Carpenter I, and Carpenter II.

Trainees may work off the project site. Training hours will be applied to the project hourly goals by using payroll records. *Only hours worked at the project site will be reimbursed by the Wage Support Fund.*

The On-the-Job Training Program Manager will conduct monthly interviews. Supervisors will be contacted in advance to locate OJT trainees and their supervisors. Skill increases and job performance will be documented.

On-the-Job Training Program Manager (Maureen Murray)

MaineHousing provides the services of an On-the-Job Training Program Manager.

All MaineHousing financed projects carry the same standards and goals. This is a state- wide program contributing to construction recruitment in many communities. Each project brings Affordable Housing and Job/Training opportunities to the local community. This program is modeled on the nationally recognized Maine Department of Transportation OJT Program. This program is responsible for training many hundreds of women and minorities in truck driving and equipment operation, improving the economic well being of Maine since 1988.
The involvement of the Developer/Owner on MaineHousing financed multifamily affordable housing projects will open the door to skills training for women and minorities in the building trades.

The MaineHousing On-the-Job Training Program Manager works to provide community awareness of the project and the training opportunities available. Recruitment channels are established in the area of a project. Contractors are assisted with non-traditional recruitment. Field support assists both trainee and trainer in recognizing skill building and developing effective communication. The OJT Program Manager documents training and the project hourly goal achievement. OJT progress updates will be provided to the Developer/Owner and the General Contractor.

On-the-Job Training (OJT) Program Manager Role:

- Survey contractors and subcontractors for recruitment needs.
- Provide recruitment resources and community links.
- Approve enrollments into the program; Track training hours toward the project goal.
- Notify the contractor in advance of a site visit/interview. Interviews will be conducted monthly with the trainee and the direct supervisor.
- Provide field support.
- Measure skill building and document OJT hours and completions.
- Distribute an OJT Manual. Specific Craft training outlines are included.
- Provide progress reports.

MaineHousing OJT Program Manager
Maureen M. Murray
mmurray@mainehousing.org
207-626-4696

MAINE STATE HOUSING AUTHORITY

EQUAL OPPORTUNITY AND AFFIRMATIVE ACTION PLAN FOR MULTI-FAMILY HOUSING FINANCE PROGRAMS

Introduction

This document is the affirmative action plan for Maine State Housing Authority (*MaineHousing*) programs which make financing available for the acquisition, rehabilitation and construction of affordable multi-family housing in Maine. This plan identifies the equal opportunity and affirmative action policies and goals for the applicants, developers, project owners, contractors, subcontractors and other persons or entities that benefit from MaineHousing's programs. This plan includes affirmative outreach and recruitment procedures designed to provide equal access for women, minorities and persons with disabilities to the economic benefits of MaineHousing's programs.

This plan is established pursuant to the following applicable Federal and State equal employment opportunity and affirmative action laws: Executive Order 11246, as amended by Executive Orders 11375, 11478, 12086 and 12107 and 40 C.F.R. Part 60 (*Equal Employment Opportunity Programs*), Section 3 of the Housing and Urban Development Act of 1968 (24 C.F.R. Part 135), Executive Order 11625, as amended by Executive Order 12007 (*Minority Business Enterprises*), Executive Order 12432, Executive Order 12138, as amended by Executive Order 12608 (*Women's Business Enterprise*), the Maine Human Rights Act (5 M.R.S.A. Chapter 337, Subchapter III), Section 3 of the Housing and Urban Development Act of 1968 ("Section 3") and the Code of Fair Practices and Affirmative Action (5 M.R.S.A. Chapter 65), and regulations promulgated pursuant thereto).

Equal Opportunity Policy

MaineHousing does not discriminate in any manner against any employee, applicant for employment or contractor or in engaging the services of any contractor on the basis of race, color, religion, national origin, ancestry, age, sex, sexual orientation, or physical or mental disability. Employment activities in which MaineHousing does not discriminate include, without limitation, employment, upgrading, promotions, demotions, transfers, recruitment or recruitment advertising, disciplinary action, layoffs, terminations, rates of pay, benefits or other forms of compensation and selection for training.

As an equal opportunity employer, MaineHousing requires all applicants, developers, project owners, contractors (including construction managers), subcontractors and agents of MaineHousing and all other persons and entities that benefit from MaineHousing's programs to provide equal opportunity in employment and contracting and comply with all State and Federal statutes, regulations and directives governing equal opportunity.

Contract Requirements

All contracts and subcontracts entered into by MaineHousing, applicants, developers, project owners, agents, contractors (including construction managers) and subcontractors in connection with MaineHousing's programs shall contain the following provisions.

"During the performance of this contract, the contractor agrees as follows:

a. The contractor will not discriminate in any manner against any employee or applicant for employment because of race, color, religion, national origin, ancestry, age, sex, sexual orientation, or physical or mental disability. Such action shall include, without limitation, employment, upgrading, promotions, demotions, transfers, recruitment or recruitment advertising, layoffs or terminations, rates of pay or other forms of compensation and selection for training.

b. The contractor will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, national origin, ancestry, age, sex, sexual orientation, or physical or mental disability.

c. The contractor will send to each labor union or representative of the workers with which the contractor has a collective bargaining agreement or other contract or understanding whereby the contractor is furnished with labor for the performance of this contract, a notice advising such labor union or workers' representative of the contractor's obligations under this section and shall post copies of the notice in conspicuous places available to employees and to applicants for employment.

d. The contractor will cause the foregoing provisions to be inserted in all contracts for any work covered by this Agreement so that such provisions will be binding upon each agent or subcontractor."

Affirmative Action Goal

It is MaineHousing's goal to foster the development of a well-qualified diverse workforce in all segments and at all levels of the industries that benefit from MaineHousing's programs. In particular, there is a manifest imbalance in the construction industry's employee profile. Traditionally, there have been few, if any, women, minorities and persons with disabilities employed in the segment of the construction industry that rehabilitates and constructs MaineHousing-financed multi-family housing.

Initially, MaineHousing's goal is to achieve the minimum level of participation by women and minorities in the housing construction industry required by Federal law. At least 6.9% of all hours worked by employees of a contractor or subcontractor during the prior calendar year must be worked by women. In addition, at least 0.5% of all hours worked by employees of a contractor or subcontractor during the prior calendar year must be worked by other minorities.

In furtherance of this goal, MaineHousing is establishing the following procedures to actively recruit women, minorities and persons with disabilities in the housing construction industry.

On-the-Job Training Requirement

All construction contracts between a project owner and a contractor (including a construction manager) for the construction or rehabilitation of multi-family housing funded by MaineHousing in an amount equal to $1,000,000 shall provide for on-the-job training in a skilled trade or technical area for women and minorities in accordance with this plan.

Contractors or subcontractors shall provide a minimum of 700 hours of on-the-job training (*OJT*) for each $1,000,000 increment of the total construction contract. For example, if the construction contract amount is $3,500,000, the contractor and/or subcontractor(s) must provide at least 2100 hours of the on-the-job training to persons who are women or minorities. The OJT hours may be performed in connection with a MaineHousing-funded multi-family housing project or other construction project, provided that the project is located in the State of Maine. The general contractor (or construction manager) and MaineHousing, including any consultant retained by MaineHousing to monitor OJT and the construction analyst assigned to the MaineHousing-funded project, will collectively determine how the requisite OJT hours will be performed. The general contractor and MaineHousing, including the consultant and the construction analyst, will enter into a written agreement which describes the plan for satisfying the requisite OJT hours to be performed.

A person receiving on-the-job training shall be paid wages equal to 75% of the wage rate for the trade in which the person is receiving the training as established annually by the Maine Department of Labor pursuant to the *State Minimum Wage Rates on State Construction Projects*, 26 MRSA § 1304 et seq. and associated regulations. An amount equal to Five and No/100 Dollars ($5.00) per hour of the wages paid to the person receiving on-the-job training must be included as an allowance in the project development budget. The owner will pay this allowance as a reimbursement to the contractor or subcontractor providing the on-the-job training upon notice from MaineHousing's OJT Compliance Monitor that the contractor or subcontractor satisfied its on-the-job training obligations. The owner shall not release the allowance to reimburse the contractor or subcontractor until it receives such notice.

A contractor (including construction managers and subcontractors) will be exempt from the above OJT requirement if the percentage of all hours worked by its employees during the prior calendar year is 6.9% for women and 0.5% for minorities.

Outreach Efforts to Women and Minority-Owned Businesses

Certain federal equal access and affirmative action laws require recipients of federal funding to provide job training, employment and contracting opportunities to women- and minority-owned businesses to the greatest extent possible. Accordingly, all developers, applicants and contractors shall solicit construction (including construction management) and other bids from women and minority-owned businesses involved in the construction of multi-family housing in Maine.

MaineHousing will require all developers and applicants to provide evidence of their outreach efforts prior to issuing a financing commitment under MaineHousing's programs.

Outreach Efforts to Women and Minorities

All applicants, developers, contractors and subcontractors shall post all employment opportunities within their businesses or organizations with Maine Career Centers and Women Unlimited or any successor organization designated by MaineHousing. MaineHousing will require all developers and applicants to provide evidence of their outreach efforts prior to issuing a financing commitment under MaineHousing's programs.

Section 3 - Outreach Efforts to Low Income Persons

Section 3 requires recipients of federal funding to provide job training, employment and contracting opportunities to Section 3 residents and Section 3 businesses to the greatest extent possible. Section 3 residents are residents of public or federally-assisted housing and persons with low income (defined as persons with income at or below 80% of area median income as determined by HUD). A Section 3 business is a business in which 51% or more of the business is owned by persons with low income or a business that employees a substantial number of persons with low income, i.e. at least 30% of its full-time, permanent employees are persons with low income. Ideally, the Section 3 residents should be from the area in which the multi-family housing is being constructed. In accordance with the goals of Section 3, at least 10% of the contracts for building trades and at least 3% of all other contracts associated with the construction or rehabilitation of a multi-family housing project should be directed to Section 3 businesses.

MaineHousing will require all developers and applicants to provide evidence of their outreach efforts prior to issuing a financing commitment under MaineHousing's programs.

Bid Requirements

All bid packages for the construction and rehabilitation of multi-family housing financed by MaineHousing must set forth the above requirements. MaineHousing is flexible with respect to how the on-the-job training requirements are set forth in the bid package. Contractors (including construction managers) shall consult with the MaineHousing construction analyst assigned to the project to determine whether to include the general requirements or specify how the OJT training requirements will be satisfied in the bid package.

MaineHousing

Multifamily Housing Projects
On-the-Job Training
Program Guidelines for the Developer/Owner

The Developer or Owner of a MaineHousing financed multifamily housing project is responsible for assisting in the implementation of the MaineHousing On-the-Job Training program and the achievement of *Hourly Training Goals for Women and Minorities* set forth in the bid contract. This requirement is outlined in **MaineHousing's Affirmative Action Plan** which can be found at:

http://www.mainehousing.org/Documents/QAP/2007QAPProgramAffirmativeActionPlan.pdf

The Role of the Developer/Owner

- To communicate the training commitment of the project to the General Contractor engaged in the project.

- To facilitate the Wage Support Fund. This fund will supplement investment in training with a five dollar an hour payment to Subcontractors participating in the OJT Program. OJT Training hours will be verified by the MaineHousing OJT Program Manager. At the completion of 700 hours, a report of job training results will be generated to the Developer/Owner, the Project Construction Analyst and the MaineHousing Loan Officer. Wage support reimbursement funds will be released by the MaineHousing Loan Officer to the Subcontractor following the receipt of an invoice. Only hours worked on the MaineHousing financed multifamily housing project will be approved for reimbursement.

  (Important note: For all multifamily housing projects which applied to MaineHousing between December 2, 2005 and November 1, 2007, the wage support fund is not required, but highly encouraged. For all multifamily housing projects which applied on November 1, 2007 and after, the wage support fund is required.

- To approve an OJT training plan created by the General Contractor,

- Subcontractors and the MaineHousing OJT Program Manager.

Project Training Plan

The Developer/Owner shall request that the General Contractor survey subcontractors engaged in the project to identify those with entry level job positions available. The OJT Program Manager will arrange a meeting the General Contractor and Subcontractors to create a project training plan. Early identification of the skill craft position (carpenter, painter, plumber, etc.) allows time to recruit the best candidates for training.

Entry level recruitment is essential to the future of the building industry.

- Building construction has a graying workforce and very few young people are entering construction as a career. New sources of recruitment and new faces have to be found.
- On-the-Job Training is a proven model that quickly integrates people into learning the construction skills necessary for earning a secure financial future.
- A bridge to community resources is built as recruitment channels are created for contractors.
- Diversity is an added value to any workplace.

MaineHousing On-the-Job Training adds the important values of construction skills training, income opportunity, and diversity to a construction project.

MaineHousing
Maine State Housing Authority

353 Water Street
Augusta, Maine 04330-4633

GROUP HEALTHCARE COVERAGE PROPOSAL
for MaineHousing-Financed Multi-Family Housing Projects

1. Project Name:

3. Total Construction Bid: Price:

2. Pledged Coverage Level (as chosen by developer):

____%

4. Coverage Goals (Pick one – must match Pledge amount in #2.):

____% of Total Construction Cost or
____ % of All Contractors

Column A	Column B	Column C	Column D		Column E
Contractor, Subcontractor or Vendor	Trade	Material and/or Labor Cost ($)	Is an Eligible Health Insurance Plan Offered?		Eligible Construction Cost (If checked "Yes" in Column D, then enter the$ amount from Column C)
			Yes	No	

Use as many pages as necessary to document compliance.

Column A	Column B	Column C	Column D		Column E
Contractor, Subcontractor or Vendor	Trade	Material and/or Labor Cost ($)	Is an Eligible Health Insurance Plan Offered?		Eligible Construction Cost (If checked "Yes" in Column D, then enter the$ amount from Column C)
			Yes	No	
	TOTALS:	$ -			$ -

5. Actual Coverage	6. Coverage Requirements Satisfied (For MaineHousing Use Only)
___________ % of Total Construction Cost or ___________ % of All Contractors	☐ Yes ☐ No

NOTES:

An Eligible Health Insurance Plan is a plan that either (a) provides coverage for employees and the contractor pays at least 60% of the premium for employee coverage or, in the alternative, (b) provides family coverage for employees and the contractor pays at least 50% of the premium for employee coverage plus some portion of the premium for the family coverage.

At the time of bidding and upon submitting a formal proposal to perform the construction work, the bidder shall include this form, filled out to the best of the bidder's ability, understanding that not all materials vendors and/or subcontractors may be fully known at the time of bid. In the case of an unknown resource, please indicate "UNKNOWN" in the Contractor/Subcontractor/Vendor column along with its assigned value in the form and suggest to the best of the bidders ability if the work will be performed by a contractor or the materials will be provided by a supplier that has an Eligible Health Insurance Plan.

Once the developer selects the winning bids, the developer shall forward the details of all bids received, including without limitation, the Group Healthcare Coverage Proposal forms submitted by all bidders, to MaineHousing. MaineHousing will review the bids to determine whether the developer satisfied its obligation or, if not, made a good faith effort to comply.

If compliance is being provided by the % of contract value method (total value of the construction work that is being provided by contractor or construction manager, subcontractors, and vendors that have an Eligible Health Insurance Plan, divided by the total bid for the work expressed as a percent), it may be possible to demonstrate compliance (i.e. meet the minimum requirement) without selecting all proposed project team members.

In the case where compliance is being provided by the % of the number of construction team members (contractor or construction manager, subcontractors, vendors) who provide an Eligible Health Insurance Plan, divided by the total number of construction team members, compliance can only be properly demonstrated by disclosing all entities that will be providing goods and/or services throughout the duration of the project. For the purposes of identifying entities who will be providing a meaningful contribution to the cost of the work, a value of the goods and/or services provided shall be in excess of $5,000. Any difference between the total costs and the sum of the costs of the team members shall be considered negligible and not be used to evaluate compliance.

MaineHousing
Maine State Housing Authority

FINAL CERTIFICATE AND LIEN RELEASE
for
CONTRACTORS / SUBCONTRACTORS / VENDORS

Any material supplier or subcontractor who supplied material or labor with a value greater than or equal to $2,000 must complete this form.

PROJECT _____ Contract/Subcontract Date: _____
ADDRESS _____ Contract/Subcontract Amt: $ _____
_____ Contract/Subcontract for (trade) _____

1. The undersigned certifies that there is due and payable under the above contract a final payment of $_____.

2. The undersigned certifies that all work required under this contract has been performed in accordance with the terms of the contract and was completed on _____, 20__.

3. The undersigned certifies that, except as set forth above, there are no unpaid claims for materials, supplies or equipment and no claims of laborers or mechanics for unpaid wages arising out of the performance of the contract.

4. The undersigned releases any and all claims, other than for the final payment set forth above, arising under or by virtue of the contract and agrees to indemnify the Maine State Housing Authority and the owner against any such claims.

5. The undersigned has attached to this certificate all manufacturers' and suppliers' written guarantees and warranties covering materials and equipment furnished under the contract.

Contractor:_____ Date:_____

Signature:_____

State of Maine

County of _____, ss. Date:_____

Personally appeared the above-named _____ and gave oath to the foregoing.

Before me,

_____

Name
Notary Public of Maine/Attorney-at-Law
My Commission Expires:_____

MaineHousing
Maine State Housing Authority

Incomplete Work Escrow

Project name/address:

MH project number:

Owner/Developer:
Contractor:
Architect:
CA:

The following items represent project features that have been determined to be incomplete as the result of:

☐ Seasonal limitations. ☐ Extraordinary circumstances w/MSHA concurrence ☐ Other

The value of all incomplete items as determined by the project team, with concurrence by Maine Housing, shall be multiplied by a factor of 150% to establish the total amount to be subject to escrow in accordance with MaineHousing policy.

#	Description	$ Value	x 150%
1			
2			
3			
4			
	Sub Total:		

Notes: _____

The amount of $ _____ shall be withheld by MaineHousing till such time that work has been completed and determined acceptable by the Owner and representative of MaineHousing. Work shall be completed by: _____
Upon satisfactory completion of the items listed above, the Authority will prepare a release of funds being withheld against those work items. At no time shall an aggregate amount exceeding 50% of the total escrow amount be released prior to completion of all escrow items.

_____ *Contractor* _____ *Date* _____ *Owner* _____ *Date* _____ *Architect* _____ *Date* _____ *MaineHousing CA* _____ *Date*

Request for Concurrence *for MaineHousing use only*

As the result of an inspection on _____ , Construction Services finds:

☐ All work is complete/satisfactory
☐ Outstanding work remains as follows... _____

○ **Completion date exceeded**
☐ Extend to: _____ ☐ No extension... MH/Owner to complete

_____ *Construction Analyst* _____ *Date* _____ *Construction Services Manager* _____ *Date*

To: Development Assistant
RE: Request for check **Date:** _____
CC: AM, LO
In accordance with CS findings/recommendations, please prepare check in the amount of
$ _____ made payable to:

1st _____

_____

2nd _____

Request for Concurrence *for MaineHousing use only*

As the result of an inspection on _____ , Construction Services finds:

☐ All work is complete/satisfactory
☐ Outstanding work remains as follows... _____

○ **Completion date exceeded**
☐ Extend to: _____ ☐ No extension... MH/Owner to complete

_____ *Construction Analyst* _____ *Date* _____ *Construction Services Manager* _____ *Date*

To: Development Assistant
RE: Request for check **Date:** _____
CC: AM, LO
In accordance with CS findings/recommendations, please prepare check in the amount of
$ _____ made payable to:

1st _____

_____

2nd _____

INCOMPLETE WORK ESCROW POLICY

Following represents the complete policy for the handling of incomplete work escrow and expressly supersedes any and all instructions to Authority personnel.

1. ***MaineHousing*** will establish the content, completion date and appropriate retainage for the incomplete work escrow at the time of the final inspection in consultation with the contractor and architect, and in accordance with policy herein.

2. Eligible escrow items shall be limited to seasonal items, and back-ordered items (if proof of ordering is provided at the final inspection), unless the Authority determines that extraordinary circumstances warrant inclusion of other, non-safety related items.

3. 150% times the actual escrow amount shall be held in escrow by ***MaineHousing*** to cover any and all escrow items.

4. All escrow work shall be completed in full within 60 days from date of agreement, unless a longer period is agreed upon initially for seasonal or back-ordered items. No more than two (2) 15-day extensions shall be allowed beyond the initial completion date.

5. The Owner shall notify ***MaineHousing*** in writing when all items of an escrow section are complete and ready for inspection. No inspections shall be made until said notification has been received. ***MaineHousing*** shall schedule an inspection within 5 working days after receipt of notice from the owner.

6. Any MaineHousing inspection which determines the necessity for a re-inspection due to an action, omission, or deficiency caused by the development team, ***may*** result in charges billable to the Developer to cover the costs of labor and expense to MaineHousing for the re-inspection. The rate of charge shall be $***25.00*** per man-hour for on-site time, $***15.00*** per man-hour for travel time from MaineHousing's office to site and return. A maximum charge per re-inspection shall not exceed $***200.00***.

7. Upon acceptance of all items in an escrow section ***MaineHousing*** will prepare a release of those funds being withheld against those work items. AT NO TIME SHALL AN AGGREGATE AMOUNT EXCEEDING 50% OF THE TOTAL ESCROW AMOUNT BE RELEASED PRIOR TO COMPLETION OF ALL ESCROW ITEMS.

8. Upon the forfeiture of escrow monies to ***MaineHousing, MaineHousing*** shall proceed to have all incomplete work escrow items completed by a contractor, determined in the sole discretion of ***MaineHousing*** to be capable of completing said escrow items. Any escrow funds remaining, if any, after completing said escrow items shall be returned to the Developer.

9. WAIVERS TO THE ABOVE POLICY MAY ONLY BE APPROVED BY MAINEHOUSING'S EXECUTIVE DIRECTOR.

MaineHousing
Maine State Housing Authority

OWNER/AGENCY CERTIFICATE OF COMPLETION

Owner(s): _____

_____

Property Address: _____

_____

MaineHousing Project No. _____ Number of Units _____

The undersigned Owner(s) certifies as follows:

1. The loan funds I have received from the Maine State Housing Authority to undertake property improvements have now been appropriately spent.

2. The improvements for which I used the money have been completed to my satisfaction and are the same improvements listed in Exhibit "A" of the Rehab Escrow or as listed in the Technical Services Document Sign Off, except as amended with the prior written consent of the Maine State Housing Authority.

3. The attached List of Tenants and Income is complete and accurate as of this date. (List all units, if vacant so note)

The undersigned Owner(s) swears under penalty of law that he/she/they have read and understood this Certificate and that to the best of his/her/their knowledge and belief it is true.

OWNER:

By: _____ Date: _____
Name:

By: _____ Date: _____
Name:

APPROVAL BY Maine State Housing Authority:

By: _____ Date: _____

MAINE STATE HOUSING AUTHORITY USE ONLY

Final Escrow Draw occurred on: _____ (Date) Remaining Escrow Funds _____

Recommended Initial Annual Inspection _____ (Mo. / Yr.) Remaining Funds to: _____

CC: Legal; Asset Management); Development Manager

MaineHousing
Maine State Housing Authority

CERTIFICATE OF COMPLETION OF DESIGN PROFESSIONAL

Project _____

Project Address: _____

_____

Architect/Engineer: _____

I certify that the construction/improvements to the above-named project have been completed to my knowledge, information and belief in accordance with the contract documents including any change orders approved by Maine State Housing Authority. I have endeavored to guard the completed work against defects and deficiencies of construction, though not necessarily through exhaustive or continuous on-site inspections to check the quality of the construction.

Change Order	Date	MaineHousing Approval Date

Architect/Engineer: _____

Title: _____

_____
Signature of Design Professional

Date: _____

353 Water Street, Augusta, Maine 04330-4633 207-626-4600 800-452-4668 TTY 800-452-4603 Fax 207-626-4678
www.mainehousing.org

MaineHousing
Maine State Housing Authority

Development Division Memorandum

Project:
Address:
Project No.

CONSTRUCTION SERVICES
FINAL COMPLETION CHECKLIST

1	*	Date	Architect	Certificate of Substantial Completion (AIA document normally prepared by architect)
2	*		Arch/Owner	Architects Certificate of Punch list Completion (MSHA Document or letter from Design Professional)
3	*		Contractor	Elevator License (if applicable)
4	*		Contractor	Fire Alarm system Test Report and Sign-off by System Manufacturer's Rep
5	*		Contractor	Sprinkler Test Report/Sign-off by qualified installer and SFMO permit signed-off by "RMS"
6	*		Contractor	Certificate of Occupancy from local municipality
7	**		Contractor	Electrical Permit Sign-off by state or local electrical inspector
8	**		Contractor	Plumbing Permit Sign-off by state or local plumbing inspector
9	*		Architect	Certificate of Completion of Design Professional (**MSHA Document**)
10	*		All	Incomplete Work Escrow in the Amount of: $
11	*		Contractor	Requisition for all items not identified on Incomplete Work Escrow list (item #10)
12	*		Contractor	Lien Releases (typically using **MSHA's Contractors Final Certificate and Release Form**)
13	*		Contractor	O & M manuals (deliver to Owner) *as applicable*
14	*		Contractor	Warranty information to Owner (e.g. Roofing, Boilers.) *as applicable*
15	*		Contractor	As-built drawings (deliver to Owner, copy to MSHA)
16	*		Owner	As-built survey with MSHA Certification (may be waived if work did not increase building footprint)
17	*		Contractor	State Fire Marshal Inspection and Plan of Correction (if required)
18	*		Owner	Owner/Agency Certificate of Completion (**MSHA Doc.**)
19	NR		Contractor	Evidence of satisfactory Lead Based Paint Clearance testing (not required for new construction)
20	*		Contractor	Consent of Surety to release of final payment
21	*		Contractor	Blower Door Test
22	*		Owner	Commissioning Report
23	*		Owner	Green Std #10 Educational Materials (approved by Asset Management Division, MaineHousing)

* Required NR Not Required ** Required unless covered under local Certificate of Occupancy

Construction Services has received and reviewed the documents outlined above and find them suitable to satisfy closeout/completion requirements per Construction Services requirements:

/Construction Analyst :	Date:
Don McGilvery/Construction Services Manager :	Date:

MAINE STATE HOUSING AUTHORITY
INSURANCE REQUIREMENTS FOR
MULTI-FAMILY AND SUPPORTIVE HOUSING

The following insurance requirements apply to all multi-family residential rental projects and supportive housing projects that are or will be financed by Maine State Housing Authority.

The requirements contained herein are the minimum requirements of MaineHousing and are for the sole benefit of MaineHousing as lender. MaineHousing is in no way representing or warranting that the minimum coverage required herein is adequate. The Developer is solely responsible for providing and determining the adequacy of insurance coverage for the Developer and the project.

Maine Housing reserves the right, at any time, to modify the insurance requirements, including without limitation, requiring additional insurance coverage of such types and in such amounts and form as MaineHousing determines is necessary or in MaineHousing's best interest, as conditions warrant.

COMPLIANCE CHECKLIST

A MaineHousing Insurance Compliance Checklist(s), in form and substance prescribed by MaineHousing, must be completed by the insurance agent(s) providing insurance coverage for a project. The completed MaineHousing Insurance Checklist(s) must be submitted to MaineHousing for review prior to any loan closing.

GENERAL

All required insurance coverage shall:

- Be in form acceptable to MaineHousing;
- Be provided at the sole cost and expense of the developer, including without limitation, any deductible or self-insured retention, and coverage shall apply for the benefit of MaineHousing as if no such deductible or self-insured retention applies;
- Be in effect prior to the policy inception date and prior to the commencement of any activities covered by such insurance and shall remain valid and in effect during the term of the financing, except any insurance coverage during the course of construction of projects shall remain valid and in effect during the term of the construction contract and any extended warranty period or such longer period as set forth below;

- Be issued by an insurer licensed to do business in the State of Maine, or if not so licensed, approved by the Maine Superintendent of Insurance, and currently rated "A VIII" or better by AM Best;

- Provide at least 30 days written notice to MaineHousing prior to the effective date of any assignment, cancellation, non-renewal or modification, except for non-payment of premium in which case at least 10 days written notice to MaineHousing prior to the effective date of cancellation or non-renewal shall be provided; and

- During construction without any MaineHousing financing (either directly or through a participation in the construction loan), include "*Maine State Housing Authority, its successors and assigns*" with a mailing address of 353 Water Street, Augusta, Maine, 04330, or such other address as MaineHousing may designate from time to time as "Certificate Holder"; and

- During the term of any MaineHousing financing (either directly or through a participation in the construction loan), include "*Maine State Housing Authority, its successors and assigns*" with a mailing address of 353 Water Street, Augusta, Maine, 04330, or such other address as MaineHousing may designate from to time, as "Mortgagee" and "Loss Payee" on all builder's risk coverage, property coverage, boiler and machinery coverage and flood coverage (as applicable) and as "Additional Insured" on all general liability and umbrella liability coverage. The additional insured endorsement shall state "*Maine State Housing Authority, its successors and assigns*, is an additional insured for both ongoing and completed operations and should provide the same coverage as ISO CG 20 10 (11-85 version). Endorsements with coverage no less broad than ISO CG 20 26 (07-04 version) with ISO CG 20 37 (07-04 version) shall also be provided.

Developers shall submit certificates of insurance evidencing in-force coverage to MaineHousing for review and approval and evidence of payment of premiums for all required insurance coverage prior to loan closing. Developers shall submit renewal certificates to MaineHousing for review and approval at least 15 days prior to the expiration of the existing coverage. Each certificate of insurance shall be accompanied by a checklist in form prescribed by MaineHousing analyzing whether the insurance coverage evidenced by the certificate complies with these requirements. The checklist shall be completed and signed by the insurance agent issuing the certificate of insurance.

MaineHousing may, at any time, request a copy, certified copy or original of the policy and any endorsements for any or all of the required insurance coverage. Upon request, a developer shall promptly deliver all requested insurance policies and endorsements to MaineHousing in the form requested.

MaineHousing's acceptance of any certificate or policy of insurance does not ensure compliance with the requirements set forth herein or waive any right of MaineHousing to determine that the coverage does not comply with the requirements.

REQUIREMENTS DURING CONSTRUCTION

The following insurance shall be obtained and maintained during the construction of the project or such longer period as set forth below.

A. Builder's Risk Insurance

Builder's risk insurance can be provided by the owner or the general contractor of the project, provided if the general contractor provides the coverage, the owner, its successors and assigns, must be named as an additional insured on the policy.

Amount/ Valuation	100% of the completed value of all structures (existing and to be constructed) and all materials, equipment, supplies and temporary structures being built or stored at or near the construction site. Completed value will be determined by MaineHousing in its sole discretion. Completed value will not include any site or land costs other than demolition. Loss recoveries must be valued at completed value without deduction for depreciation. For rehabilitation projects, building shells and other salvageable components shall be insured for replacement cost. Replacement cost for historic structures or structures located in an historic district will depend on historic preservation requirements for replacing the structure.
Coverage	No less broad than ISO Form CP 10 30 (*Special Cause of Loss*), but does not have to be on the ISO form No exclusions for scaffolding No exclusions for testing No coinsurance provision shall apply. An Agreed Value Endorsement is required if the policy includes a coinsurance provision. Coverage must include the interest of the owner, all contractors, subcontractors and suppliers as their interests may appear. Rights of subrogation against MaineHousing must be waived.
Additional Coverage/ Endorsements	Earthquake – 100% of completed value Flood if located in a designated special flood hazard area (*Zone A or Zone V or any zone with an A prefix*) – maximum

	coverage available under the Standard National Flood Insurance Program. MaineHousing may require additional coverage in an amount up to 100% of completed value as determined by MaineHousing based on the location of the project within the designated special flood hazard area and the history of flooding. Flood if not located in a designated special flood hazard area, but is otherwise required by MaineHousing based on the property's proximity to a designated special flood hazard area and history of flooding – 100% of completed value Delay of Opening (loss of income) equal to 100% of anticipated gross annual rents Soft Cost Endorsement (indemnification of finance charges) Permission to Occupy Endorsement (permission is granted for occupancy of the insured project for the purpose it was intended)
Deductible	Up to $2,500 unless a higher limit is approved by MaineHousing
Term	Builders risk insurance coverage shall remain valid and in effect until a permanent property policy acceptable to MaineHousing is in place
Insured	Owner or General Contractor
Additional Insured	Owner, its successors and assigns, if coverage is provided by the General Contractor

B. Owner Insurance Coverage

Commercial General Liability

Minimum Amount	$2,000,000 General Aggregate $2,000,000 Products and Completed Operations Aggregate $1,000,000 Personal and Advertising Injury $1,000,000 Each Occurrence Aggregate limits shall apply on a "per location" or "per project" basis. MaineHousing may require higher limits

Coverage	No less broad than latest ISO form CG 00 01, but does not have to be on the ISO form Coverage may exclude War, Abuse and Molestation, Fungus, Nuclear Energy, Employment-related Practices, Asbestos and Terrorism. All other exclusions must be reviewed and approved by MaineHousing.
Form	Occurrence basis form

Workers' Compensation/Employer's Liability Insurance

If the owner of the project is a limited partnership or limited liability company and does not have any employees, these requirements apply to the general partner(s) or member(s)/manager(s).

Minimum Amount	$500,000 Each Accident $500,000 Disease – Each Employee $500,000 Disease – Policy Limit or amounts required by statute, whichever is greater
Coverage	Insurance or an approved self-insurance program with coverage required under Maine Workers' Compensation Act

Automobile Liability Insurance

Minimum Amount	$1,000,000 Each Accident
Coverage	Owned, hired and non-owned vehicles
Form	ISO form CA 00 01 or equivalent

Umbrella Liability Insurance

Minimum Amount	$1,000,000 for structures with up to 3 floors $3,000,000 to $10,000,000 as determined by MaineHousing, for structures with 4 or more floors
Coverage	Excess of General Liability, Automobile Liability and Employer's Liability No less broad than General Liability, Automobile Liability and Employer's Liability
Form	Occurrence basis form

C. Contractor Insurance Coverage (includes general contractors, construction managers and major subcontractors)

Commercial General Liability

Minimum Amount	$2,000,000 General Aggregate $2,000,000 Products and Completed Operations Aggregate $1,000,000 Personal and Advertising Injury $1,000,000 Each Occurrence Aggregate limits shall apply on a "per location" or "per project" basis. MaineHousing may require higher limits
Coverage	No less broad than latest ISO form CG 00 01, but does not have to be on the ISO form Coverage may exclude War, Abuse and Molestation, Fungus, Nuclear Energy, Employment-related Practices, Asbestos and Terrorism. All other exclusions must be reviewed and approved by MaineHousing.
Form	Occurrence basis form

Workers' Compensation/Employer's Liability Insurance

Minimum Amount	$500,000 Each Accident $500,000 Disease – Each Employee $500,000 Disease – Policy Limit or amounts required by statute, whichever is greater
Coverage	Insurance or an approved self-insurance program with coverage required under Maine Workers' Compensation Act

Automobile Liability Insurance

Minimum Amount	$1,000,000 Each Accident
Coverage	Owned, hired and non-owned vehicles
Form	ISO form CA 00 01 or equivalent

Umbrella Liability Insurance

Minimum Amount	$1,000,000 for structures with up to 3 floors $3,000,000 to $10,000,000 as determined by MaineHousing, for structures with 4 or more floors
Coverage	Excess of General Liability, Automobile Liability and Employer's Liability No less broad than General Liability, Automobile Liability and Employer's Liability
Form	Occurrence basis form

D. Design Professional Coverage (including architects and engineers)

Professional Errors and Omissions Insurance

Minimum Amount	$1,000,000 Each Occurrence $1,000,000 Aggregate For projects with total construction costs less than $1,500,000, MaineHousing may consider lower coverage amounts, but in no case, less than $500,000 Each Occurrence and $500,000 Aggregate
Coverage	If coverage is on claims made basis, the retroactive date must predate the work being performed.
Term	Coverage must remain in place for 3 years after project completion

E. Environmental Remediation Contractor's Coverage (only projects contaminated with hazardous substances, lead, asbestos and other pollutants)

Pollution Liability Coverage

Minimum Amount	$1,000,000
Coverage	Cleanup, property damage and bodily injury The retroactive date must pre-date the remediation work start date

REQUIREMENTS FOR COMPLETED PROJECTS

The following insurance shall be obtained and maintained by the owner of the project during the term of MaineHousing's financing.

Property Insurance Coverage

Amount/Valuation	100% of the replacement cost of all structures, improvements and contents. Replacement value shall be determined by MaineHousing and shall be a minimum of $150 per square foot. Replacement cost for historic structures or structures located in an historic district will depend on historic preservation requirements for replacing the structure. Loss recoveries must be valued at replacement cost without deduction for depreciation. No coinsurance provision shall apply. An Agreed Value Endorsement is required if the policy includes a coinsurance provision. Coverage must include the interest of the owner and all other interests as they may appear. Rights of subrogation against MaineHousing must be waived.
Coverage/ Endorsements	No less broad than ISO Form CP 10 30 (*Special Cause of Loss*), but does not have to be on the ISO form Earthquake – 100% of the replacement cost Wind – 100% of the replacement cost Flood if located in a designated special flood hazard area (*Zone A or Zone V or any zone with an A prefix*) – maximum coverage available under the Standard National Flood Insurance Program. MaineHousing may require additional coverage in an amount up to 100% of the replacement cost as determined by MaineHousing based on the location of the project within the designated special flood hazard area and the history of flooding. Flood if not located in a designated special flood hazard area, but is otherwise required by MaineHousing based on the property's proximity to a designated special flood hazard area and history of flooding – 100% of the replacement cost

	Loss of Rental Income coverage equal to 100% of anticipated gross annual rents
	Ordinance and Law coverage at no less than 10% of the value of all structures and improvements for demolition and increased cost of construction
Deductible	Up to $2,500 unless a higher limit is approved by MaineHousing
Form	ISO Form CP 10 30 (*Special Cause of Loss*) or equivalent
	Evidence of coverage must be on *Accord Form 28* indicating compliance with the property insurance requirements set forth herein.
	If written on a Business Owner's Policy, ISO Form BP 04 83 is required.
	Standard National Flood Insurance Program form for flood, if required

<u>Boiler and Machinery Insurance Coverage</u> (if not included in property insurance coverage)

Amount/ Valuation	100% of the replacement cost of all structures, improvements and contents. Replacement value shall be determined by MaineHousing and shall be a minimum of $150 per square foot. Replacement cost for historic structures or structures located in an historic district will depend on historic preservation requirements for replacing the structure.
	Loss recoveries must be valued at replacement cost without deduction for depreciation.
	No coinsurance provision shall apply. An Agreed Value Endorsement is required if the policy includes a coinsurance provision.
	Coverage must include the interest of the owner and all other interests as they may appear. Rights of subrogation against MaineHousing must be waived.
Coverage/ Endorsements	Loss of Rental Income coverage equal to 100% of anticipated gross annual rents

	Ordinance and Law coverage at no less than 10% of the value of all structures and improvements for demolition and increased cost of construction
Deductible	Up to $2,500 unless a higher limit is approved by MaineHousing 24 hour maximum deductible on Use and Occupancy
Form	*Accord Form 28* indicating compliance with these requirements

Crime Coverage

If the property manager has custody of the owner's funds, both the owner and the property manager must obtain and maintain this coverage.

Amount	25% of anticipated gross annual rents
Coverage	Employee Dishonesty, Forgery and Alteration

Commercial General Liability

Minimum Amount	$2,000,000 General Aggregate $2,000,000 Products and Completed Operations Aggregate $1,000,000 Personal and Advertising Injury $1,000,000 Each Occurrence Aggregate limits shall apply on a "per location" or "per project" basis. MaineHousing may require higher limits
Coverage	No less broad than latest ISO form CG 00 01, but does not have to be on the ISO form Coverage may exclude War, Abuse and Molestation, Fungus, Nuclear Energy, Employment-related Practices, Asbestos and Terrorism. All other exclusions must be reviewed and approved by MaineHousing.
Form	Occurrence basis form

Workers' Compensation/Employer's Liability Insurance

If the owner is a limited partnership or limited liability company and does not have any employees, these requirements apply to the general partner(s) or member(s)/manager(s).

Minimum Amount	$500,000 Each Accident $500,000 Disease – Each Employee $500,000 Disease – Policy Limit or amounts required by statute, whichever is greater
Coverage	Insurance or an approved self-insurance program with coverage required under Maine Workers' Compensation Act

Automobile Liability Insurance

Minimum Amount	$1,000,000 Each Accident
Coverage	Owned, hired and non-owned vehicles
Form	ISO Form CA 00 01 or equivalent

Garagekeepers Liability Insurance (if owner provides for-fee parking to public)

Minimum Amount	$25,000 per vehicle

Umbrella Liability Insurance

Minimum Amount	$5,000,000
Coverage	Excess of General Liability, Automobile Liability and Employer's Liability No less broad than General Liability, Automobile Liability and Employer's Liability
Form	Occurrence basis form

Pollution Liability Coverage (only projects contaminated with hazardous substances, lead, asbestos and other pollutants)

Minimum Amount	$1,000,000
Coverage	Cleanup, property damage and bodily injury The retroactive date must pre-date the remediation work start date

MAINEHOUSING SURVEY REQUIREMENTS
for
CONSTRUCTION LOAN CLOSINGS AND PERMANENT LOAN CLOSINGS

General Requirements

The developer must submit to MaineHousing, at least 30 days before closing, an ALTA/ACSM Land Title Survey using current standards, including the *2005 Minimum Standard Detail Requirements for ALTA/ACSM Land Title Surveys* as adopted by ALTA and NSPS effective January 1, 2006, including the items from *Table A Optional Survey Responsibilities and Specifications* ("Table A") noted below, and the *Accuracy Standards for ALTA/ACSM Land Title Surveys.* The survey must be performed by a professional land surveyor registered in Maine.

The survey must contain, on its face, the certification appearing below, addressed to Maine State Housing Authority, the title insurance company insuring MaineHousing's mortgage, and any other appropriate parties. The certification must be signed by the surveyor and bear the current date and the surveyor's seal and registration number. The survey must show the date of completion of the survey as well as all revision dates.

Additional Requirements

In addition to the General Requirements noted above, the survey must include the following information:

1. Scale must be not less than 40 feet to the inch, with the plat or map not less than 11" x 17" in size.
2. A metes and bounds description that clearly and accurately follows the survey.
3. The street address of the property, conforming to the municipality's records, on the face of the survey.
4. Item 1 of Table A (monuments).
5. Item 2 of Table A (vicinity map).
6. Item 3 of Table A (flood zone designation).
7. Item 4 of Table A (gross land area).
8. Item 6 of Table A (setback, height and floor area restrictions of zoning ordinance).
9. Item 7(a) and (b)(1) of Table A (building exterior dimensions and square footage of building footprint).
10. Item 9 of Table A (parking areas).
11. Item 10 of Table A (access to public ways).
12. Item 11(a) and (b) of Table A (locations of utilities, including locations in streets to points of entry into all buildings). **The precise location of all utilities, including existing utilities and utilities installed during construction and utilities located aboveground and underground, must be shown on the as-built survey. All at-**

grade or aboveground appurtenances related to the various utilities (including but not limited to sanitary sewer, storm sewer, domestic water, fire service, electric power, gas, telephone, television, and internet service) shall be field located and shown on the as-built survey. The locations of all below-grade structures (including but not limited to pipes, ducts, conduits, lines, cables, and connections) shall be shown on the as-built survey and shall be based on as-built drawings provided by the owner of the project, or in the absence of accurate as-built drawings, information provided by Dig Safe or a similar service. The documentation used to identify the below-grade structures shall be referenced on the as-built survey.

13. Density requirements of zoning ordinance and the source of the information.

Required Certification

The following certification must appear in the form shown below:

This is to certify to Maine State Housing Authority, [name of title insurance company], and [names of other parties], and the successors and assigns of each, that this map or plat and the survey on which it is based were made in accordance with the "Minimum Standard Detail Requirements for ALTA/ACSM Land Title Surveys," jointly established and adopted by ALTA and NSPS in 2005, effective January 1, 2006, and includes items 1, 2, 3, 4, 6, 7(a) and (b)(1), 9, 10, and 11(a) and (b) of Table A thereof. Pursuant to the Accuracy Standards as adopted by ALTA and NSPS and in effect on the date of this certification, the undersigned further certifies that in my professional opinion as a land surveyor registered in the State of Maine, the Relative Positional Accuracy of the survey does not exceed the Allowable Relative Positional Accuracy for Measurements Controlling Land Boundaries on ALTA/ACSM Land Title Surveys. The undersigned additionally certifies that (a) this survey correctly shows all matters of record (and to the extent they can be located, their location and dimensions) of which I have been advised affecting the subject property according to the legal description of such matters (with instrument, book and page number indicated); (b) except as shown on this survey, no part of the subject property is located in a 100-year floodplain, as shown on Flood Insurance Rate Map No. _____ dated _____; (c) to the best of my knowledge, this survey shows the relation and distance of all buildings, sidewalks and other improvements to easements and setback lines; (d) to the best of my knowledge, except as shown on this survey, the subject property does not serve any adjoining land for drainage, utilities, ingress or egress; (e) all utilities serving the subject property shown on the survey, including electric, gas, water, sanitary sewer and storm sewer, connect to lines located in public roadways, without crossing the property of others, as shown on the survey, except [if none, so state]; and (f) except as set forth below, there are no (i) encroachments upon the subject property by improvements on adjacent property, (ii) encroachments on easements or on adjacent property, streets, or alleys by any improvements on the subject property, (iii) party walls, (iv) conflicts or protrusions, or (v) encroachments onto setback or building restriction lines. The exceptions to the statements in part (f) are as follows: _____ [if none, so state].

MaineHousing
Maine State Housing Authority

CONSTRUCTION SERVICES
PRECONSTRUCTION DOCUMENT REVIEW WORKSHEET

The following documents are required to be reviewed and approved by Construction Services prior to the construction loan closing or, in the case of "one writes", where MaineHousing acts as the construction lender, prior to the commencement of work on subject property:

1. Full set of approved, sealed working drawings and specifications signed by the Owner, Architect, Contractor, and MaineHousing. (For projects with a rehab cost of less then $200,000 a written scope of work may be sufficient to satisfy this requirement.)

2. Construction contract signed by the Owner and Contractor and approved by MaineHousing. The contract agreement shall address the following issues:
   - Reference the scope of work or plans, specs and addenda by the most recent revision date
   - Large projects should contain detailed schedule of values and unit prices
   - Specify a specific completion date or time (number of calendar days to complete project)
   - Contract to specify amount and terms of liquidated damages and/or early completion bonus
   - Amount and reduction of retainage
   - All Change Orders Proposals and Change Orders must be approved by *MaineHousing*
   - CM Contracts contain shared savings clause
   - Contractor Shall provide list of Subcontractors (contracts exceeding $2000.00) and Suppliers/Venders (purchases exceeding $10,000.00)

3. Contractor's Certificate of Insurance, including Builder's Risk coverage if applicable, **with Maine State Housing Authority listed as certificate holder** and location of project clearly stated. The certificate shall list coverage for General Liability, Motor Vehicle, and Worker's Comp.
   Note:
   The Builder's Risk certificate must state: "*certificate holder is mortgagee at this location*" (location of project must be clear). In the event the Owner supplies the Builder's Risk coverage, a Certificate of Insurance in the same form from the Owner's insurance company.
   Design Professional's Certificate of Insurance specifying extent of Errors and Omissions coverage with Maine State Housing authority listed as a certificate holder.

4. Copy of the Building permit from the local Code Enforcement Officer or other satisfactory evidence of local approval.

5. Copy of the Construction Permit and Barrier Free Permit issued by the Department of Public Safety, State Fire Marshal's Office. (For small, non licensed rehab projects this requirement may be waived)

6. One hundred percent Performance and Payment bonds with dual obligee rider naming Maine State Housing Authority. (For projects under $200,000 this requirement may be waived)

7. Health Insurance Contractor Compliance Form / Percentage confirmed.

8. Commissioning Report (Design phase) and Commissioning Plan listing required inspections and testing.

In certain cases additional information such as an Environmental Site Assessment or itemized cost breakdown may be required.

2005 MINIMUM STANDARD DETAIL REQUIREMENTS FOR ALTA/ACSM LAND TITLE SURVEYS
as adopted by
American Land Title Association
and
National Society of Professional Surveyors
(a member organization of the American Congress on Surveying and Mapping)

It is recognized that members of the American Land Title Association (ALTA) have specific needs, peculiar to title insurance matters, which require particular information for acceptance by title insurance companies when said companies are asked to insure title to land without exception as to the many matters which might be discoverable from survey and inspection and not be evidenced by the public records. In the general interest of the public, the surveying profession, title insurers and abstracters, ALTA and the National Society of Professional Surveyors, Inc. (NSPS) jointly promulgate and set forth such details and criteria for standards. It is recognized and understood that local and state standards or standards of care, which surveyors in those respective jurisdictions are bound by, may augment, or even require variations to the standards outlined herein. Where conflicts between the standards outlined herein and any jurisdictional statutes or regulations occur, the more restrictive requirement shall apply. It is also recognized that title insurance companies are entitled to rely on the survey furnished to them to be of an appropriate professional quality, both as to completeness and as to accuracy. It is equally recognized that for the performance of a survey, the surveyor will be provided with appropriate data which can be relied upon in the preparation of the survey.

For a survey of real property and the plat or map of the survey to be acceptable to a title insurance company for purposes of insuring title to said real property free and clear of survey matters (except those matters disclosed by the survey and indicated on the plat or map), certain specific and pertinent information shall be presented for the distinct and clear understanding between the client (insured), the title insurance company (insurer), and the surveyor (the person professionally responsible for the survey). These requirements are:

1. The client shall request the survey or arrange for the survey to be requested and shall provide a written authorization to proceed with the survey from the person responsible for paying for the survey. Unless specifically authorized in writing by the insurer, the insurer shall not be responsible for any costs associated with the preparation of the survey. The request shall specify that an **"ALTA/ACSM LAND TITLE SURVEY"** is required and shall designate which of the optional items listed in Table A are to be incorporated. The request shall set forth the record description of the property to be surveyed or, in the case of an original survey, the record description of the parent parcel that contains the property to be surveyed. Complete copies of the record description of the property (or, in the case of an original survey, the parent parcel), any record easements benefiting the property; the record easements or servitudes and covenants burdening the property ("Record Documents"); documents of record referred to in the Record Documents; and any other documents containing desired appropriate information affecting the property being surveyed and to which the survey shall make reference shall be provided to the surveyor for notation on the plat or map of survey.

2. The plat or map of such survey shall bear the name, address, telephone number, and signature of the professional land surveyor who performed the survey, his or her official seal and registration number, the date the survey was completed, the dates of all of the surveyor's revisions and the caption "ALTA/ACSM Land Title Survey" with the certification set forth in paragraph 8.

3. An **"ALTA/ACSM LAND TITLE SURVEY"** shall be in accordance with the then-current "Accuracy Standards for Land Title Surveys" ("Accuracy Standards") as adopted, from time to time by the National Society of Professional Surveyors and the American Land Title Association and incorporated herein by reference.

4. On the plat or map of an **"ALTA/ACSM LAND TITLE SURVEY,"** the survey boundary shall be drawn to a convenient scale, with that scale clearly indicated. A graphic scale, shown in feet or meters or both, shall be included. A north arrow shall be shown and when practicable, the plat or map of survey shall be oriented so that north is at the top of the drawing. Symbols or abbreviations used shall be identified on the face of the plat or map by use of a legend or other means. If necessary for clarity, supplementary or exaggerated diagrams shall be presented accurately on the plat or map. The plat or map shall be a minimum size of 8½ by 11 inches.

5. The survey shall be performed on the ground and the plat or map of an **"ALTA/ACSM LAND TITLE SURVEY"** shall contain, in addition to the required items already specified above, the following applicable information:

(a) All data necessary to indicate the mathematical dimensions and relationships of the boundary represented, with angles given directly or by bearings, and with the length and radius of each curve, together with elements necessary to mathematically define each curve. The point of beginning of the surveyor's description shall be shown as well as the remote point of beginning if different. A bearing base shall refer to some well-fixed line, so that the bearings may be easily re-established. The North arrow shall be referenced to its bearing base and should that bearing base differ from record title, that difference shall be noted.

(b) When record bearings or angles or distances differ from measured bearings, angles or distances, both the

record and measured bearings, angles, and distances shall be clearly indicated. If the record description fails to form a mathematically closed figure, the surveyor shall so indicate.

(c) Measured and record distances from corners of parcels surveyed to the nearest right-of-way lines of streets in urban or suburban areas, together with recovered lot corners and evidence of lot corners, shall be noted. For streets and highways abutting the property surveyed, the name, the width and location of pavement relative to the nearest boundary line of the surveyed tract, and the width of existing rights of way, where available from the controlling jurisdiction, shall be shown. Observable evidence of access (or lack thereof) to such abutting streets or highways shall be indicated. Observable evidence of private roads shall be so indicated. Streets abutting the premises, which have been described in Record Documents, but not physically opened, shall be shown and so noted.

(d) The identifying titles of all recorded plats, filed maps, right of way maps, or similar documents which the survey represents, wholly or in part, shall be shown with their appropriate recording data, filing dates and map numbers, and the lot, block, and section numbers or letters of the surveyed premises. For non-platted adjoining land, names, and recording data identifying adjoining owners as they appear of record shall be shown. For platted adjoining land, the recording data of the subdivision plat shall be shown. The survey shall indicate platted setback or building restriction lines which have been recorded in subdivision plats or which appear in Record Documents which have been delivered to the surveyor. Contiguity, gores, and overlaps along the exterior boundaries of the surveyed premises, where ascertainable from field evidence or Record Documents, or interior to those exterior boundaries, shall be clearly indicated or noted. Where only a part of a recorded lot or parcel is included in the survey, the balance of the lot or parcel shall be indicated.

(e) All evidence of monuments shall be shown and noted to indicate which were found and which were placed. All evidence of monuments found beyond the surveyed premises on which establishment of the corners of the surveyed premises are dependent, and their application related to the survey shall be indicated.

(f) The character of any and all evidence of possession shall be stated and the location of such evidence carefully given in relation to both the measured boundary lines and those established by the record. An absence of notation on the survey shall be presumptive of no observable evidence of possession.

(g) The location of all buildings upon the plot or parcel shall be shown and their locations defined by measurements perpendicular to the nearest perimeter boundaries. The precision of these measurements shall be commensurate with the Relative Positional Accuracy of the survey as specified in the current Accuracy Standards for ALTA/ACSM Land Title Surveys. If there are no buildings erected on the property being surveyed, the plat or map shall bear the statement, "No buildings." Proper street numbers shall be shown where available.

(h) All easements evidenced by Record Documents which have been delivered to the surveyor shall be shown, both those burdening and those benefiting the property surveyed, indicating recording information. If such an easement cannot be located, a note to this effect shall be included. Observable evidence of easements and/or servitudes of all kinds, such as those created by roads; rights-of-way; water courses; drains; telephone, telegraph, or electric lines; water, sewer, oil or gas pipelines on or across the surveyed property and on adjoining properties if they appear to affect the surveyed property, shall be located and noted. If the surveyor has knowledge of any such easements and/or servitudes, not observable at the time the present survey is made, such lack of observable evidence shall be noted. Surface indications, if any, of underground easements and/or servitudes shall also be shown.

(i) The character and location of all walls, buildings, fences, and other visible improvements within five feet of each side of the boundary lines shall be noted. Without expressing a legal opinion, physical evidence of all encroaching structural appurtenances and projections, such as fire escapes, bay windows, windows and doors that open out, flue pipes, stoops, eaves, cornices, areaways, steps, trim, etc., by or on adjoining property or on abutting streets, on any easement or over setback lines shown by Record Documents shall be indicated with the extent of such encroachment or projection. If the client wishes to have additional information with regard to appurtenances such as whether or not such appurtenances are independent, division, or party walls and are plumb, the client will assume the responsibility of obtaining such permissions as are necessary for the surveyor to enter upon the properties to make such determinations.

(j) Driveways, alleys and other ways of access on or crossing the property must be shown. Where there is evidence of use by other than the occupants of the property, the surveyor must so indicate on the plat or map. Where driveways or alleys on adjoining properties encroach, in whole or in part, on the property being surveyed, the surveyor must so indicate on the plat or map with appropriate measurements.

(k) As accurately as the evidence permits, the location of cemeteries and burial grounds (i) disclosed in the Record Documents provided by client or (ii) observed in the process of performing the field work for the survey, shall be shown.

(l) Ponds, lakes, springs, or rivers bordering on or running through the premises being surveyed shall be shown.

6. As a minimum requirement, the surveyor shall furnish two sets of prints of the plat or map of survey to

the title insurance company or the client. If the plat or map of survey consists of more than one sheet, the sheets shall be numbered, the total number of sheets indicated and match lines be shown on each sheet. The prints shall be on durable and dimensionally stable material of a quality standard acceptable to the title insurance company. The record title description of the surveyed tract, or the description provided by the client, and any new description prepared by the surveyor must appear on the face of the plat or map or otherwise accompany the survey. When, in the opinion of the surveyor, the results of the survey differ significantly from the record, or if a fundamental decision related to the boundary resolution is not clearly reflected on the plat or map, the surveyor may explain this information with notes on the face of the plat or map or in accompanying attachments. If the relative positional accuracy of the survey exceeds that allowable, the surveyor shall explain the site conditions that resulted in that outcome with a note on the face of the map or plat.

7. Water boundaries necessarily are subject to change due to erosion or accretion by tidal action or the flow of rivers and streams. A realignment of water bodies may also occur due to many reasons such as deliberate cutting and filling of bordering lands or by avulsion. Recorded surveys of natural water boundaries are not relied upon by title insurers for location of title.

When a property to be surveyed for title insurance purposes contains a natural water boundary, the surveyor shall measure the location of the boundary according to appropriate surveying methods and note on the plat or map the date of the measurement and the caveat that the boundary is subject to change due to natural causes and that it may or may not represent the actual location of the limit of title. When the surveyor is aware of changes in such boundaries, the extent of those changes shall be identified.

8. When the surveyor has met all of the minimum standard detail requirements for an ALTA/ACSM Land Title Survey, the following certification shall be made on the plat:

To (name of client), (name of lender, if known), (name of title insurance company, if known), (name of others as instructed by client):

This is to certify that this map or plat and the survey on which it is based were made in accordance with the "Minimum Standard Detail Requirements for ALTA/ACSM Land Title Surveys," jointly established and adopted by ALTA and NSPS in 2005, and includes Items _____ of Table A thereof. Pursuant to the Accuracy Standards as adopted by ALTA and NSPS and in effect on the date of this certification, undersigned further certifies that in my professional opinion, as a land surveyor registered in the State of _____, the Relative Positional Accuracy of this survey does not exceed that which is specified therein.

Date: (signed) (seal)
Registration No.

NOTE: If, as otherwise allowed in the Accuracy Standards, the Relative Positional Accuracy exceeds that which is specified therein, the following certification shall be made on the plat:

To (name of client), (name of lender, if known), (name of title insurance company, if known), (name of others as instructed by client):

This is to certify that this map or plat and the survey on which it is based were made in accordance with the "Minimum Standard Detail Requirements for ALTA/ACSM Land Title Surveys," jointly established and adopted by ALTA and NSPS in 2005, and includes Items _____ of Table A thereof. Pursuant to the Accuracy Standards as adopted by ALTA and NSPS and in effect on the date of this certification, undersigned further certifies that in my professional opinion, as a land surveyor registered in the State of _____, the maximum Relative Positional Accuracy is _____feet.

Date: (signed) (seal)
Registration No.

The 2005 Minimum Standard Detail Requirements for ALTA/ACSM Land Title Surveys are effective January 1, 2006. As of that date, all previous versions of the Minimum Standard Detail Requirements for ALTA/ACSM Land Title Surveys are superseded by these 2005 standards.

Adopted by the American Land Title Association on October 5, 2005.
Adopted by the Board of Directors, National Society of Professional Surveyors on October 24, 2005.
American Land Title Association, 1828 L St., N.W., Suite 705, Washington, D.C. 20036.
National Society of Professional Surveyors, Inc., 6 Montgomery Village Avenue, Suite 403, Gaithersburg, MD 20879

TABLE A

OPTIONAL SURVEY RESPONSIBILITIES AND SPECIFICATIONS

NOTE: The items of Table A must be negotiated between the surveyor and client. It may be necessary for the surveyor to qualify or expand upon the description of these items, e.g., in reference to Item 6, there may be a need for an interpretation of a restriction. The surveyor cannot make a certification on the basis of an interpretation or opinion of another party. Items 16, 17 and 18 are only for use on projects for the U.S. Department of Housing and Urban Development (HUD).

If checked, the following optional items are to be included in the ALTA/ACSM LAND TITLE SURVEY, except as otherwise negotiated:

1. _____ *Monuments placed (or a reference monument or witness to the corner) at all major corners of the boundary of the property, unless already marked or referenced by an existing monument or witness to the corner.*

2. _____ *Vicinity map showing the property surveyed in reference to nearby highway(s) or major street intersection(s).*

3. _____ *Flood zone designation (with proper annotation based on federal Flood Insurance Rate Maps or the state or local equivalent, by scaled map location and graphic plotting only.)*

4. _____ *Gross land area (and other areas if specified by the client).*

5. _____ *Contours and the datum of the elevations.*

6. _____ *List setback, height, and floor space area restrictions disclosed by applicable zoning or building codes (beyond those required under paragraph 5d of these standards). If none, so state. The source of such information must be disclosed. See "Note" above.*

7. _____ *(a) Exterior dimensions of all buildings at ground level*

   (b) Square footage of:

   _____ *(1) exterior footprint of all buildings at ground level*

   _____ *(2) gross floor area of all buildings; or*

   _____ *(3) other areas to be defined by the client*

   _____ *(c) Measured height of all buildings above grade at a defined location. If no defined location is provided, the point of measurement shall be shown.*

8. _____ *Substantial, visible improvements (in addition to buildings) such as billboards, signs, parking structures, swimming pools, etc.*

9. _____ *Parking areas and, if striped, the striping and the type (e.g. handicapped, motorcycle, regular, etc.) and number of parking spaces.*

10. _____ *Indication of access to a public way on land such as curb cuts and driveways, and to and from waters adjoining the surveyed tract, such as boat slips, launches, piers and docks..*

11. *Location of utilities (representative examples of which are shown below) existing on or serving the surveyed property as determined by:*

    _____ *(a) Observed evidence*

    _____ *(b) Observed evidence together with evidence from plans obtained from utility companies or provided by client, and markings by utility companies and other appropriate sources (with reference as to the source of information)*

    - *railroad tracks and sidings;*
    - *manholes, catch basins, valve vaults or other surface indications of subterranean uses;*
    - *wires and cables (including their function, if readily identifiable) crossing the surveyed premises, all poles on or within ten feet of the surveyed premises, and the dimensions of all crossmembers or overhangs affecting the surveyed premises; and*
    - *utility company installations on the surveyed premises.*

12. _____ *Governmental Agency survey-related requirements as specified by the client.*

13. _____ *Names of adjoining owners of platted lands.*

14. _____ *The distance to the nearest intersecting street as designated by the client*

15. _____ *Rectified orthophotography, photogrammetric mapping, laser scanning and other similar products, tools or technologies may be utilized as the basis for the location of certain features (excluding boundaries) where ground measurements are not otherwise necessary to locate those features to an appropriate and acceptable accuracy relative to a nearby boundary. The surveyor shall (a) discuss the ramifications of such methodologies (e.g. the potential accuracy and completeness of the data gathered thereby) with the title company, lender and client prior to the performance of the survey and, (b) place a note on the face of the survey explaining the source, date, relative accuracy and other relevant qualifications of any such data.*

16. _____ *Observable evidence of earth moving work, building construction or building additions within recent months.*

17. _____ *Any changes in street right of way lines either completed or proposed, and available from the controlling jurisdiction. Observable evidence of recent street or sidewalk construction or repairs.*

18. _____ *Observable evidence of site use as a solid waste dump, sump or sanitary landfill.*

19. _____

Accuracy Standards for ALTA/ACSM Land Title Surveys

Introduction

These Accuracy Standards address Relative Positional Accuracies for measurements that control land boundaries on ALTA/ACSM Land Title Surveys.

In order to meet these standards, the surveyor must assure and certify that the Relative Positional Accuracies resulting from the measurements made on the survey do not exceed that which is allowable.

If the size or configuration of the property to be surveyed, or the relief, vegetation or improvements on the property will result in survey measurements for which the allowable Relative Positional Accuracies will be exceeded, the surveyor must alternatively certify as to the Relative Positional Accuracy that was otherwise achieved on the survey.

Definition:

"Relative Positional Accuracy" means the value expressed in feet or meters that represents the uncertainty due to random errors in measurements in the location of any point on a survey relative to any other point on the same survey at the 95 percent confidence level.

Background

The lines and corners on any property survey have uncertainty in location which is the result of (1) availability and condition of reference monuments, (2) occupation or possession lines as they may differ from record lines, (3) clarity or ambiguity of the record descriptions or plats of the surveyed tracts and its adjoiners and (4) Relative Positional Accuracy.

The first three sources of uncertainty must be weighed as evidence in the determination of where, in the professional surveyor's opinion, the boundary lines and corners should be placed. Relative Positional Accuracy is related to how accurately the surveyor is able to monument or report those positions.

Of these four sources of uncertainty, only Relative Positional Accuracy is controllable, although due to the inherent error in any measurement, it cannot be eliminated. The first three can be estimated based on evidence; Relative Positional Accuracy can be estimated using statistical means.

The surveyor shall, to the extent necessary to achieve the standard contained herein, (1) compensate or correct for systematic errors, including those associated with instrument calibration, (2) select the appropriate equipment and methods, and use trained personnel and (3) use appropriate error propagation and other measurement design theory to select the proper instruments, field procedures, geometric layouts and computational procedures to control random errors.

If radial survey methods, GPS or other acceptable technologies or procedures are used to locate or establish points on the survey, the surveyor shall apply appropriate procedures in order to assure that the allowable Relative Positional Accuracy of such points is not exceeded.

Computation of Relative Positional Accuracy

Relative Positional Accuracy may be tested by:
(1) comparing the relative location of points in a survey as measured by an independent survey of higher accuracy or
(2) the results of a minimally constrained, correctly weighted least square adjustment of the survey.

Allowable Relative Positional Accuracy for Measurements Controlling Land Boundaries on ALTA/ACSM Land Title Surveys

0.07 feet (or 20 mm) + 50 ppm

State of Maine
Department of Labor
Bureau of Labor Standards
Technical Services Division
Augusta, Maine 04333-0045
Telephone (207) 623-7906

Wage Determination - In accordance with 26 MRSA §1301 et. seq., this is a determination by the Bureau of Labor Standards, of the fair minimum wage rate to be paid laborers and workers employed on the below titled project.

Title of Project : Oak Street Apartments

Location of Project : Oak Street, Portland, Maine

2010 Fair Minimum Wage Rates
Building 2 Cumberland County
(other than 1 or 2 family homes)

Occupation Title	Minimum Wage	Minimum Benefit	Total	Occupation Title	Minimum Wage	Minimum Benefit	Total
Asbestos Abatement Wrkr	$15.50	$0.65	$16.15	Insulation Installer	$18.00	$1.74	$19.74
Backhoe Loader Operator	$18.00	$2.98	$20.98	Ironworker - Reinforcing	$21.15	$17.05	$38.20
Blaster	$14.50	$1.91	$16.41	Ironworker - Structural	$18.00	$0.87	$18.87
Boilermaker	$30.19	$16.99	$47.18	Laborers/Helper/Tender	$13.00	$0.36	$13.36
Boom Truck Operator	$17.00	$3.13	$20.13	Laborer - Skilled	$16.00	$0.84	$16.84
Bricklayer	$22.00	$0.44	$22.44	Loader Op - Front End	$15.65	$2.59	$18.24
Bulldozer Operator	$17.35	$2.64	$19.99	Mechanic - Automatic Door	$21.75	$7.48	$29.23
Carpenter	$19.18	$3.01	$22.19	Mechanic - Maintenance	$21.50	$4.21	$25.71
Carpenter - Acoustical	$14.25	$2.00	$16.25	Mechanic - Refrigeration	$21.00	$4.24	$25.24
Carpenter - Rough	$15.00	$2.77	$17.77	Millwright	$22.00	$5.70	$27.70
Cement Mason/Finisher	$17.50	$0.69	$18.19	Oil/Fuel Burner Serv & Instr	$20.90	$5.92	$26.82
Commun Equip Installer	$22.00	$3.26	$25.26	Painter	$12.75	$1.24	$13.99
Concrete Mixing Plant Op	$17.43	$5.61	$23.04	Paver - Bituminous	$17.00	$0.83	$17.83
Concrete Pump Operator	$20.00	$3.49	$23.49	Pipe/Stm/Sprkler Fitter	$21.40	$4.88	$26.28
Crane Oprtr =>15 Tons	$20.75	$5.39	$26.14	Pipelayer	$18.50	$4.44	$22.94
Crusher Plant Operator	$15.25	$2.94	$18.19	Plumber (Licensed)	$22.75	$4.02	$26.77
Dry-Wall Applicator	$21.00	$1.00	$22.00	Plumber Hlpr/Trainee (Lic)	$18.25	$3.67	$21.92
Dry-Wall Taper & Finisher	$20.91	$1.42	$22.33	Pump Installer	$15.00	$2.03	$17.03
Electrician - Licensed	$23.00	$6.19	$29.19	Roofer	$16.74	$1.90	$18.64
Electrician Hlpr (Licensed)	$14.30	$2.54	$16.84	Sheet Metal Worker	$18.17	$3.43	$21.60
Elevator Constrctr/Installer	$47.20	$19.69	$66.89	Sider	$13.50	$1.20	$14.70
Excavator Operator	$17.00	$2.53	$19.53	Stone Mason	$15.00	$6.64	$21.64
Fence Setter	$8.00	$0.00	$8.00	Tile Setter	$21.50	$4.37	$25.87
Floor Layer	$16.00	$0.54	$16.54	Truck Driver - Light	$15.75	$2.17	$17.92
Furniture Installer	$15.00	$0.17	$15.17	Truck Driver - Medium	$13.55	$0.73	$14.28
Glazier	$15.00	$1.94	$16.94	Truck Driver - Heavy	$13.00	$0.30	$13.30
HVAC	$23.30	$6.83	$30.13	Truck Driver - Tractor Trailer	$13.55	$1.92	$15.47

The Laborer classifications include a wide range of work duties. Therefore, if any specific occupation to be employed on this project is not listed in this determination, call the Bureau of Labor Standards at the above number for further clarification.

Welders are classified in the trade to which the welding is incidental.

Apprentices - The minimum wage rate for registered apprentices are those set forth in the standards and policies of the Maine State Apprenticeship and Training Council for approved apprenticeship programs.

Posting of Schedule - Posting of this schedule is required in accordance with 26 MRSA §1301 et. seq., by any contractor holding a State contract for construction valued at $50,000 or more and any subcontractors to such a contractor.

Appeal - Any person affected by the determination of these rates may appeal to the Commissioner of Labor by filing a written notice with the Commissioner stating the specific grounds of the objection within ten (10) days from the filing of these rates with the Secretary of State.

Determination No: B2-000-2010

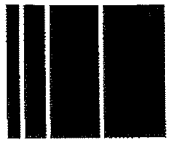
Filing Date: _____, 2010

Expiration Date: 12-31-2010

A true copy

Attest:_____
William A. Peabody
Director
Bureau of Labor Standards

SebagoTechnics
Engineering Expertise You Can Build On



Report on Subsurface and Foundation Investigation

Proposed Oak Street Live-Work Lofts Portland, Maine

for

Archetype, PA
48 Union Wharf
Portland, ME 04101

April 3, 2007

One Chabot Street, P.O. Box 1339, Westbrook, Maine 04098-1339 ✆ Ph. 207-856-0277 ✉ Fax 856-2206

Sebago Technics
Engineering Expertise You Can Build On

sebagotechnics.com
One Chabot Street
P.O. Box 1339
Westbrook, Maine
04098-1339
Ph. 207-856-0277
Fax 856-2206

April 3, 2007
07156

Mr. David Lloyd
Archetype, PA
48 Union Wharf
Portland, ME 04101

Subsurface and Foundation Investigation
Proposed Oak Street Live-Work Lofts, Portland, Maine

Dear David:

This report presents the results of our subsurface and foundation investigation for the proposed Oak Street Live-Work Lofts in Portland, Maine. These services were provided in accordance with our proposal dated March 8, 2007.

In summary, it is our opinion that the proposed building may be supported on spread and continuous footings bearing on undisturbed, naturally deposited soil, improved existing fill, or on compacted structural fill placed after excavation and replacement of unsuitable soil. In addition, an earth-supported slab-on-grade may be used for the ground floor. Specific recommendations for foundation design and construction considerations are presented below.

Introduction

The site is located at 70-82 Oak Street in Portland, Maine. The site is presently a paved parking lot. Ground surface elevations within the site limits vary from approximately El. 105 to El. 108. We understand that the building will be a 3-story structure with no basement, having a plan area of approximately 8,500 square feet. The lowest (ground floor) has not yet been established, but we anticipate that it may vary from El. 105 to El. 107. Retail stores will be located on the ground floor, and there will be eight 2-story residential units on the 2nd and 3rd floors.

Subsurface Explorations

On March 21, 2007, Maine Test Borings, Inc. (MTB) of Brewer, Maine drilled four borings, B1 to B4, at the site at locations shown on Sheet 1, Boring Plan. MTB drilled the borings to depths below ground surface varying from 6.1 feet to 11.0 feet. Sebago Technics, Inc. monitored the borings and prepared the logs included in Appendix A. Table I summarizes the results of borings. MTB backfilled the borings with the drilled soil and placed a temporary bituminous patch at the surface.

Borings were drilled using 2.5-inch inside diameter hollow stem augers. Samples were recovered at intervals from 3 feet to 5 feet. Standard penetration resistance, N, was measured at each sample interval in accordance with ASTM procedures. All borings were drilled to split-spoon sampler refusal.

Sebago Technics, Inc. determined the locations of borings by taping from site features. Ground surface elevations at borings were determined by linear interpolation between ground surface contours at the plotted locations.

The boring logs and related information depict the subsurface conditions and water levels encountered at the locations and during the times indicated on the logs. Subsurface conditions at other locations may differ from those encountered in the borings. The passage of time may result in a change in groundwater conditions at the borings.

Subsurface Conditions

The borings encountered three principal soil units below bituminous concrete and overlying bedrock at the site: fill, glacial till and weathered bedrock. Encountered thickness and generalized descriptions of the strata encountered are presented below in order of increasing depth below ground surface. Due to the complexity of the deposition process, strata thickness will vary and may be absent at specific locations.

Fill – Fill consists of very loose to medium dense, brown well-graded SAND (SW); to well-graded SAND with gravel (SW); to well-graded SAND with silt and gravel (SW-SM) with various amounts of brick, glass, clay, concrete fragments and cobbles. Encountered thickness varies from 5.1 feet to 10.2 feet.

Glacial Till – Glacial till encountered in B3 and B4 consists of very dense, brown silty SAND (SM). Encountered thickness varies from 0.1 foot to 0.6 foot.

Weathered Bedrock – Weathered bedrock consists of gray SCHIST weathered to sand, gravel and cobble size fragments. Encountered thickness varies from 0.4 foot to 3.0 feet.

All borings terminated on split-spoon refusal judged to be bedrock. The approximate elevation of bedrock varies from 95.5 feet to 99.5 feet.

Water was not encountered in the borings. Observations of water were made over a relatively short period of time and may not reflect the stabilized groundwater condition. In addition, water levels at the site will vary with season, precipitation, temperature and construction activity in the area. Therefore, water levels during and following construction will vary from that observed in the borings.

Recommendations for Foundation Design

Recommended Foundation Type and Design Criteria

The bituminous concrete and existing fill in its present condition is not considered suitable for support of the building or ground floor slab. It is not known whether the fill was placed in layers and systematically compacted. In addition, the fill contains concrete, glass and brick fragments. In our opinion, the fill will be suitable for support following over excavation and compaction with large vibratory equipment. We recommend that the building be supported on spread and continuous footings bearing on a minimum of 12 inches of compacted structural fill placed on the compacted existing fill or on undisturbed, naturally deposited soil.

Footings may be proportioned for an allowable bearing stress in pounds per square foot (psf) equal to 1,000 multiplied by the least lateral dimension of the footing in feet, up to a maximum of 3,000 psf. All footings should be a minimum of 1.5 feet wide.

Exterior footings should be founded at least 4.5 feet below the lowest adjacent ground surface exposed to freezing. Interior footings should be founded a minimum of 1.5 feet below the ground floor slab.

The existing fill consists primarily of well-graded sand with various amounts of brick and concrete fragments, glass and silt. We recommend that the existing fill be removed to approximately 1 foot below the bottom of ground floor slab and that the existing fill below this level be compacted by intensive surface compaction (ISC). We recommend that ISC be performed using a minimum 30,000 pound vibratory roller operating at 30 cycles per second (Hz) and a forward speed of 1 to 2 feet per second. Compaction should consist of 10 coverages of the vibratory roller. The direction of each two successive coverages should be rotated perpendicular to the previous two coverages. Following intensive surface compaction, a minimum of two coverages of the roller should be applied without vibration to recompact the upper surface of the fill soil.

We recommend that the existing fill be removed to 1 foot below the bearing level of footings and the excavated surface be compacted by a minimum of four passes of vibratory compaction equipment. Footing excavations should be backfilled to bearing level with compacted structural fill.

Compacted structural fill supporting footings should extend laterally from the footings to at least the limits defined by 1 horizontal to 1 vertical lines sloped outward and downward from points located at least 1 foot horizontally beyond the bottom edges of the footings.

At the recommended bearing stress, we anticipate that settlement of the building will be less than 1.0 inch. We estimate that approximately 50 percent of this settlement will occur following filling and foundation construction. Therefore, settlement during and following completion of the buildings will be on the order of 0.5 inch. We anticipate that settlement of this magnitude is acceptable. However, the structural engineer should determine final acceptability of settlement.

Ground Floor Slab

We recommend that the lowest level floor slab be designed as an earth-supported slab-on-grade bearing on the compacted structural fill placed after over excavation of existing fill and ISC as discussed above. All fill placed below the floor slab for raise-in-grade should consist of compacted structural fill.

Normal dampproofing and vapor barriers should be used below the floor slabs.

We recommend a modulus of subgrade reaction of 200 pounds per cubic inch for ground floor slab design.

Seismic Design Considerations

We recommend that the building be designed in accordance with the seismic requirements of the latest edition of the International Building Code, the site classification is Class C; the site response coefficient F_a is 1.2 for a short period spectral response acceleration S_s of 0.37g; the site response coefficient F_v is 1.7 for the 1-second period spectral response acceleration S_1 of 0.1g. The subgrade soils are not considered liquefaction susceptible.

Lateral Foundation Loads

We recommend that lateral loads be resisted by bottom friction on footings. We recommend that a coefficient of friction equal to 0.40 be used for footings. If this does not provide sufficient resistance, we will study the problem in more detail to take into account other factors.

Backfill Materials

Structural fill used below foundations and floor slabs and for backfill adjacent to walls should consist of sandy gravel to gravelly sand. It should be free of organic material, loam, trash, snow, ice, frozen soil and other objectionable material, and should conform to the following gradation:

Sieve Size	Percent Finer by Weight
6 inches	100
No. 4	30 to 90
No. 40	10 to 50
No. 200	0 to 8

Compacted structural fill should be placed in layers not exceeding 8 inches in loose measure and compacted by self-propelled vibratory equipment at the approximate optimum moisture content to a dry density of at least 95 percent of the maximum dry density, as determined in accordance with ASTM Test Designation D1557. In confined areas, the maximum particle size should be reduced to 3 inches and the loose layer thickness should be reduced to 6 inches, and compaction performed by hand-guided vibratory equipment.

Compacted structural fill on the outside of the foundation walls should extend laterally a minimum of 2 feet from the wall. Backfill beyond this limit may consist of common fill. The top 12 inches of fill on the exterior of the building should consist of low permeability material, or bituminous pavement, or sidewalks to minimize water infiltration next to the building. Grading should provide for runoff away from the building.

Common fill may consist of inorganic mineral soil that can be placed in layers and compacted. Common fill should be placed and spread in layers not exceeding 12 inches in thickness and compacted with a minimum of two systematic passes of the equipment placing the fill.

In our opinion, fill encountered in the explorations is not suitable for structural fill, but would be suitable for common fill.

Construction Considerations

General

The primary purpose of this section of the report is to comment on items related to excavation, earthwork, and related geotechnical aspects of proposed construction. It is written primarily for the engineer having responsibility for preparation of plans and specifications. Since it identifies potential construction problems related to foundations and earthwork, it will also aid personnel who monitor the construction activity. Prospective contractors for this project must evaluate the construction problems on the basis of their own knowledge and experience in the Portland, Maine area, and on the basis of similar projects in other localities, taking into account their proposed construction methods, procedures, equipment and personnel.

Excavation, Lateral Support and Control of Water

We anticipate that foundation excavation can be accomplished with sloped open excavation through the overburden soils provided safe side slopes can be maintained. Some sloughing and raveling should be anticipated in temporary slopes. Temporary excavations should be made in accordance with all OSHA and other applicable regulatory agency requirements.

We anticipate that groundwater may be encountered at proposed subgrade level or bearing level of footings. If encountered, open pumping from sumps can likely control groundwater. In general, the contractor should control groundwater and water from runoff and other sources by methods which prevent disturbance of bearing surfaces or adjacent soils and allow construction in-the-dry.

Subgrade Preparation

The subgrade soil is susceptible to disturbance from construction traffic. Equipment and personnel should not be permitted to travel across exposed footing bearing surfaces or exposed slab subgrades. Any subgrade areas that are disturbed should be recompacted or excavated and replaced with compacted structural fill prior to placing concrete. Subgrades should be protected against freezing temperatures if exposed during construction. Final excavation to subgrade should be performed using equipment with smooth-edge buckets.

Construction Monitoring

The foundation recommendations contained herein are based on the known and predictable behavior of a properly engineered and constructed foundation. Monitoring of the foundation construction is required to enable the geotechnical engineer to keep in contact with procedures and techniques used in construction. Therefore, we recommend that a person qualified by training and experience be present to provide monitoring at the site during intensive surface compaction, preparation of foundation bearing surfaces and placement of compacted structural fill.

Limitations of Recommendations

This report has been prepared for specific application to the subject project in accordance with generally accepted geotechnical engineering practices. In the event that any changes in the nature, design or location of the building are planned, the conclusions and recommendations contained in this report should not be considered valid, unless the changes are reviewed and the conclusions of this report modified or verified in writing.

The recommendations presented herein are based in part on the data obtained from the referenced borings. The nature and extent of variations between the explorations may not become evident until construction. If variations then appear evident, it will be necessary to re-evaluate the recommendations of this report.

We request that we be provided the opportunity for a general review of final design and specifications in order to determine that our earthwork and foundation recommendations have been interpreted and implemented in the design and specifications as they were intended.

It has been a pleasure to work with you on this project. Please do not hesitate to contact us if you have any questions or need additional information.

Sincerely,

SEBAGO TECHNICS, INC.

Kenneth L. Recker, P.E.
Geotechnical Engineering Manager

STATE OF MAINE
KENNETH
L.
RECKER
No. 5435
LICENSED
PROFESSIONAL ENGINEER

SEBAGO TECHNICS, INC. 25th ANNIVERSARY 1981 2006 WESTBROOK, ME

KLR:klr/jc

Enclosures:

Table I	- Summary of Borings
Sheet 1	- Boring Plan
Appendix A	- Logs of Test Borings

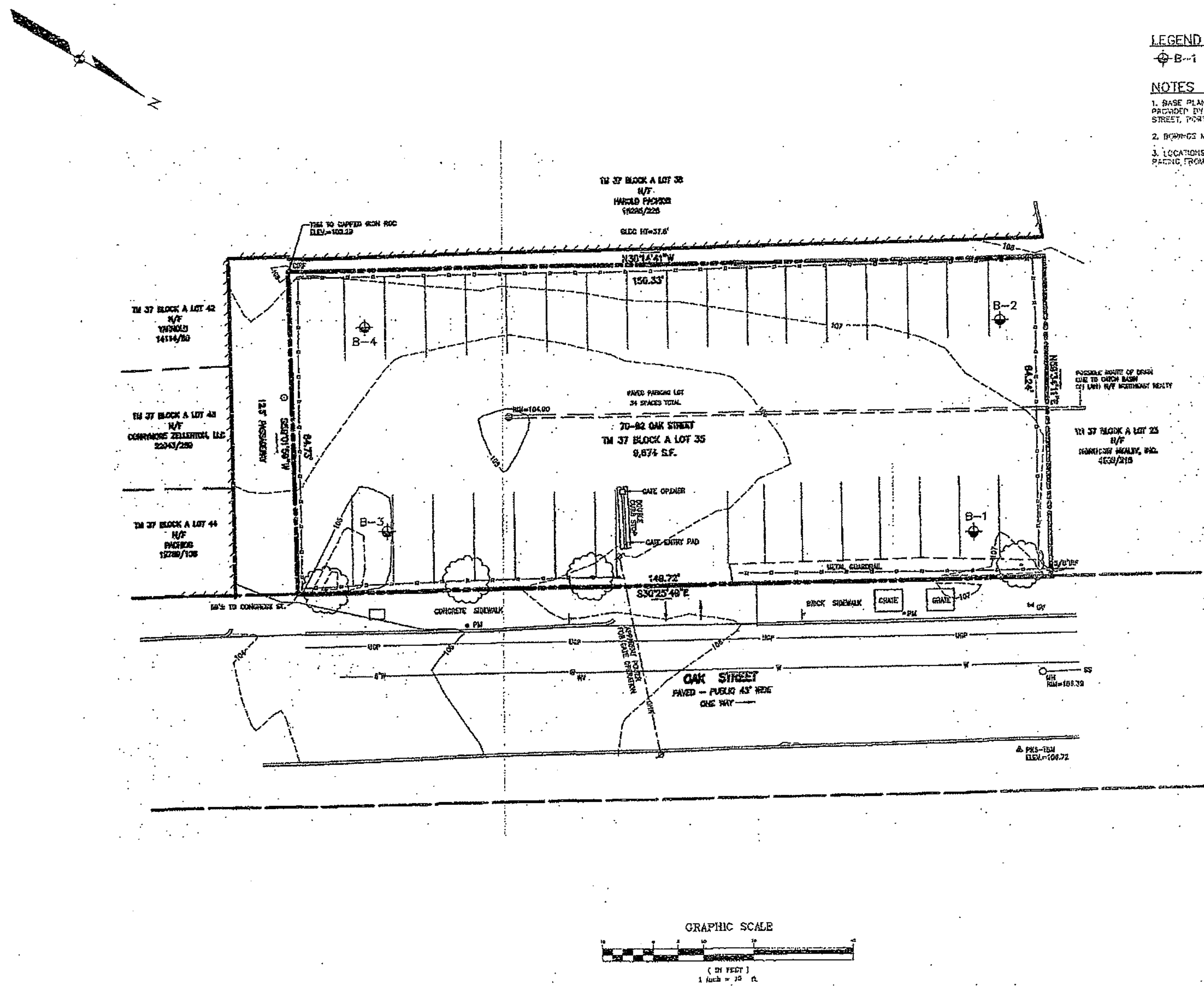
07156

TABLE I
SUMMARY OF BORINGS
PROPOSED OAK STREET LIVE-WORK LOFTS
PORTLAND, MAINE

Boring Number	Depth (Ft)	Approx. Ground Surface El. (Ft)	Depth to Water (Ft)	Strata Thickness (Ft)					Approx. El. Top of Rock (Ft)
				Bituminous Concrete	Fill	Glacial Till	Weathered Bedrock	Bedrock	
B1	10.5	106.8	NE	0.3	7.2	--	3.0	0.0*	96.3
B2	7.0	106.5	NE	0.3	5.1	--	1.6	0.0*	99.5
B3	6.1	105.3	NE	0.3	5.2	0.6	--	0.0*	99.2
B4	11.0	106.5	NE	0.3	10.2	0.1	0.4	0.0*	95.5

NOTES:

1. NE INDICATES GROUNDWATER NOT ENCOUNTERED WITHIN DEPTH OF BORING.
2. -- INDICATES STRATUM NOT ENCOUNTERED WITHIN DEPTH OF BORING.
3. * INDICATES DEPTH OF PENETRATION INTO STRATUM.



LEGEND

B-1 NUMBER AND APPROXIMATE LOCATION OF BORINGS DRILLED BY MAINE TEST BORINGS, INC. ON MARCH 21, 2007.

NOTES

1. BASE PLAN PREPARED FROM ELECTRONIC FILE IN PDF FORMAT PROVIDED BY ARCHETYPE, PA, TITLED TOPOGRAPHIC SURVEY ON OAK STREET, PORTLAND, MAINE, BY OWEN HASKELL, INC.

2. BORINGS MONITORED BY SEBAGO TECHNICS, INC.

3. LOCATIONS OF BORINGS DETERMINED BY SEBAGO TECHNICS, INC. BY PACING FROM EXISTING SITE FEATURES.

REV.	BY:	DATE:	STATUS:

Sebago Technics

BORING PLAN
OF:
OAK STREET LIVE-WORK LOFTS
70-82 OAK STREET
PORTLAND, MAINE
FOR:
ARCHETYPE PA

DATE	SC
4-4-07	1"

SHEET 1 O

Appendix A

Logs of Test Borings

SEBAGO TECHNICS, INC.

TEST BORING REPORT

BORING NO. **B1**

Page 1 of 1

PROJECT	PROPOSED OAK STREET LOFTS	STI JOB NO.	07156
LOCATION	70-82 OAK STREET, PORTLAND, MAINE	PROJECT MGR.	K. RECKER
CLIENT	ARCHETYPE, PA	FIELD REP.	K. B. STEPHENSON
CONTRACTOR	MAINE TEST BORINGS, INC.	DATE STARTED	3/21/2007
DRILLER	T. SCHAEFFER	DATE FINISHED	3/21/2007

Elevation 106.8 ft. Datum NGVD29 Boring Location See Plan

Item	Casing	Sampler	Core Barrel
Type	HSA	SS	
Inside Diameter (in.)	2.5	1.375	
Hammer Weight (lb.)		140	
Hammer Fall (in.)		30	

Rig Make & Model: Mobile B53

☑ Truck ☐ Tripod ☑ Cat-Head
☐ ATV ☐ Geoprobe ☐ Winch
☐ Track ☐ Air Track ☐ Roller Bit
☐ Skid ☑ Cutting Head

Hammer Type: ☑ Safety ☐ Doughnut ☐ Automatic

Drilling Mud: ☐ Bentonite ☐ Polymer ☑ None

Casing Advance: Type Method Depth: HSA/Spin/10.0

Drilling Notes:

Depth (ft.)	Sampler Blows per 6 in.	Sample No. & Recovery (in.)	Sample Depth (ft.)	Well Diagram	Stratum Change (ft.)	USCS Symbol	Visual-Manual Identification & Description (density/consistency, color, GROUP NAME & SYMBOL, maximum particle size*, structure, odor, moisture, optional descriptions, geologic interpretation)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0					0.3		-BITUMINOUS CONCRETE-										
							Note: brown sand with gravel, concrete, brick, probable cobbles to 2.5 ft.										
							-FILL-										
					2.5												
	6	S1	2.5			SW	Loose, brown well-graded SAND (SW), trace silt, dry			20	50	30					
	3																
	2																
	3	8	4.5				-FILL-										
5																	
	1	S2	5.0			SW	Very loose, brown well-graded SAND (SW), brick, glass, probable cobble	5	5	45	40	5					
	2						fragments, mps = 1.3 in., dry										
	1/12 in.	6	7.0				-FILL-										
					7.5												
10																	
	70	S3	10.0				Very dense, gray weathered SCHIST, dry										
		6	10.5		10.5		-WEATHERED BEDROCK-										
							Split spoon refusal at 10.5 ft.										
							Bottom of exploration at 10.5 ft. below ground surface										
15																	
20																	
25																	
30																	

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth in feet to: Bottom of Casing	Bottom of Hole	Water
3/21/07	1116		10.0	10.5	Dry

Sample ID

O Open End Rod
T Thin Wall Tube
U Undisturbed Sample
S Split Spoon Sample
G Geoprobe

Well Diagram

Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary

Overburden (Linear ft.)	7.5
Rock Cored (Linear ft.)	--
Number of Samples	3S
BORING NO.	B1

Field Tests

Dilatancy: R - Rapid S - Slow N - None
Toughness: L - Low M - Medium H - High
Plasticity: N - Nonplastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High V - Very High

*NOTE: Maximum Particle Size is determined by direct observation within the limitations of sampler size.

NOTE: Soil identifications based on visual-manual methods of the USCS system as practiced by Sebago Technics, Inc.

SEBAGO TECHNICS, INC.

TEST BORING REPORT

BORING NO. **B2**

Page 1 of 1

PROJECT	PROPOSED OAK STREET LOFTS	STI JOB NO.	07156
LOCATION	70-82 OAK STREET, PORTLAND, MAINE	PROJECT MGR.	K. RECKER
CLIENT	ARCHETYPE, PA	FIELD REP.	K. B. STEPHENSON
CONTRACTOR	MAINE TEST BORINGS, INC.	DATE STARTED	3/21/2007
DRILLER	T. SCHAEFFER	DATE FINISHED	3/21/2007

Elevation 106.5 ft. Datum NGVD29 Boring Location See Plan

Item	Casing	Sampler	Core Barrel
Type	HSA	SS	
Inside Diameter (in.)	2.5	1.375	
Hammer Weight (lb.)		140	
Hammer Fall (in.)		30	

Rig Make & Model: Mobile B53

☑ Truck ☐ Tripod ☑ Cat-Head
☐ ATV ☐ Geoprobe ☐ Winch
☐ Track ☐ Air Track ☐ Roller Bit
☐ Skid ☐ _____ ☑ Cutting Head

Hammer Type: ☑ Safety ☐ Doughnut ☐ Automatic

Drilling Mud: ☐ Bentonite ☐ Polymer ☑ None

Casing Advance: Type Method Depth — HSA/Spin/5.0

Drilling Notes:

Depth (ft.)	Sampler Blows per 6 in.	Sample No. & Recovery (in.)	Sample Depth (ft.)	Well Diagram	Stratum Change (ft.)	USCS Symbol	Visual-Manual Identification & Description (density/consistency, color, GROUP NAME & SYMBOL, maximum particle size*, structure, odor, moisture, optional descriptions, geologic interpretation)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0					0.3		-BITUMINOUS CONCRETE-										
							Note: brown sand with gravel in cuttings to 1.3 ft.										
					1.3		-SUBBASE/FILL-										
					2.0	SW	Note: brown well-graded SAND (SW) in cuttings from 1.3 to 2.0 ft., dry			20	50	30					
	4	S1	2.0			SW	Loose, brown well-graded SAND with gravel (SW), mps = 1.0 in., dry	5	15	40	30	10					
	3																
	2																
	3	16	4.0				-FILL-										
5																	
	5	S2	5.0		5.4	SW	Loose, brown well-graded SAND with gravel (SW), mps = 1.0 in., dry	5	15	40	30	10					
	17						Very dense, brown weathered SCHIST, dry										
	30						-WEATHERED BEDROCK-										
	72	19	7.0		7.0												
							Split spoon refusal at 7.0 ft.										
							Bottom of exploration at 7.0 ft. below ground surface										
10																	
15																	
20																	
25																	
30																	

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth in feet to: Bottom of Casing	Bottom of Hole	Water
3/21/07	1015		5.0	7.0	Dry

Sample ID

O Open End Rod
T Thin Wall Tube
U Undisturbed Sample
S Split Spoon Sample
G Geoprobe

Well Diagram

Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary

Overburden (Linear ft.)	5.4
Rock Cored (Linear ft.)	--
Number of Samples	2S

BORING NO. B2

Field Tests

Dilatancy: R - Rapid S - Slow N - None
Toughness: L - Low M - Medium H - High
Plasticity: N - Nonplastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High V - Very High

*NOTE: Maximum Particle Size is determined by direct observation within the limitations of sampler size.

NOTE: Soil identifications based on visual-manual methods of the USCS system as practiced by Sebago Technics, Inc.

SEBAGO TECHNICS, INC.

TEST BORING REPORT

BORING NO. B3

Page 1 of 1

PROJECT	PROPOSED OAK STREET LOFTS	STI JOB NO.	07156
LOCATION	70-82 OAK STREET, PORTLAND, MAINE	PROJECT MGR.	K. RECKER
CLIENT	ARCHETYPE, PA	FIELD REP.	K. B. STEPHENSON
CONTRACTOR	MAINE TEST BORINGS, INC.	DATE STARTED	3/21/2007
DRILLER	T. SCHAEFFER	DATE FINISHED	3/21/2007

Elevation 105.3 ft. Datum NGVD29 Boring Location See Plan

Item	Casing	Sampler	Core Barrel
Type	HSA	SS	
Inside Diameter (in.)	2.5	1.375	
Hammer Weight (lb.)		140	
Hammer Fall (in.)		30	

Rig Make & Model: Mobile B53

☑ Truck ☐ Tripod ☑ Cat-Head
☐ ATV ☐ Geoprobe ☐ Winch
☐ Track ☐ Air Track ☐ Roller Bit
☐ Skid ☐ ☑ Cutting Head

Hammer Type: ☑ Safety ☐ Doughnut ☐ Automatic

Drilling Mud: ☐ Bentonite ☐ Polymer ☑ None

Casing Advance: Type Method Depth — HSA/Spin/5.5

Drilling Notes:

Depth (ft.)	Sampler Blows per 6 in.	Sample No. & Recovery (in.)	Sample Depth (ft.)	Well Diagram	Stratum Change (ft.)	USCS Symbol	Visual-Manual Identification & Description (density/consistency, color, GROUP NAME & SYMBOL, maximum particle size*, structure, odor, moisture, optional descriptions, geologic interpretation)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0					0.3		-BITUMINOUS CONCRETE-										
							Note: brown sand with silt and gravel in cuttings to 1.3 ft., mps = 2.0 in.	20	10	30	20	10	10				
							-SUBBASE/FILL-										
					2.0												
	8	S1	2.0			SW	Medium dense, brown well-graded SAND with gravel (SW), mps = 1.0 in.,	10	5	40	30	15					
	10						dry										
	14				3.7		-FILL-										
	16	20	4.0		4.0	CL	Very stiff, gray-brown mottled lean CLAY (CL), organic fibers, dry-FILL-					10	90	N	M	M	
							Note: brown silty sand with gravel, root fibers in cuttings from 4.0 to 5.5 ft., probable cobbles										
5					5.5		-FILL-										
	30	S2	5.5			SM	Very dense, gray-brown silty SAND (SM), mps = 0.75 in., damp	5	5	30	30	15	15				
	50/0.1	6	6.1		6.1		-GLACIAL TILL-										
							Split spoon refusal at 6.1 ft. on probable bedrock										
							Bottom of exploration at 6.1 ft. below ground surface										
10																	
15																	
20																	
25																	
30																	

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth in feet to: Bottom of Casing	Bottom of Hole	Water
3/21/2007	1415		5.5	6.0	Dry

Sample ID

O Open End Rod
T Thin Wall Tube
U Undisturbed Sample
S Split Spoon Sample
G Geoprobe

Well Diagram

Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary

Overburden (Linear ft.)	6.1
Rock Cored (Linear ft.)	--
Number of Samples	2S

BORING NO. B3

Field Tests — Dilatancy: R - Rapid S - Slow N - None; Toughness: L - Low M - Medium H - High; Plasticity: N - Nonplastic L - Low M - Medium H - High; Dry Strength: N - None L - Low M - Medium H - High V - Very High

*NOTE: Maximum Particle Size is determined by direct observation within the limitations of sampler size.

NOTE: Soil identifications based on visual-manual methods of the USCS system as practiced by Sebago Technics, Inc.

SEBAGO TECHNICS, INC.

TEST BORING REPORT

BORING NO. **B4**

Page 1 of 1

PROJECT	PROPOSED OAK STREET LOFTS	STI JOB NO.	07156
LOCATION	70-82 OAK STREET, PORTLAND, MAINE	PROJECT MGR.	K. RECKER
CLIENT	ARCHETYPE, PA	FIELD REP.	K. B. STEPHENSON
CONTRACTOR	MAINE TEST BORINGS, INC.	DATE STARTED	3/21/2007
DRILLER	T. SCHAEFFER	DATE FINISHED	3/21/2007

Elevation 106.5 ft. Datum NGVD29 Boring Location See Plan

Item	Casing	Sampler	Core Barrel
Type	HSA	SS	
Inside Diameter (in.)	2.5	1.375	
Hammer Weight (lb.)		140	
Hammer Fall (in.)		30	

Rig Make & Model: Mobile B53

☑ Truck ☐ Tripod ☑ Cat-Head
☐ ATV ☐ Geoprobe ☐ Winch
☐ Track ☐ Air Track ☐ Roller Bit
☐ Skid ☑ Cutting Head

Hammer Type: ☑ Safety ☐ Doughnut ☐ Automatic

Drilling Mud: ☐ Bentonite ☐ Polymer ☑ None

Casing Advance: Type Method Depth — HSA/Spin/10.5

Drilling Notes:

Depth (ft.)	Sampler Blows per 6 in.	Sample No. & Recovery (in.)	Sample Depth (ft.)	Well Diagram	Stratum Change (ft.)	USCS Symbol	Visual-Manual Identification & Description (density/consistency, color, GROUP NAME & SYMBOL, maximum particle size*, structure, odor, moisture, optional descriptions, geologic interpretation)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0					0.3		-BITUMINOUS CONCRETE-										
						SW	Note: brown well-graded SAND with gravel (SW), brick, mps = 1.5 in. in cuttings from 0.3 to 2.0 ft.	10	10	30	30	15	5				
							-FILL-										
	6	S1	2.0			SW	Loose to medium dense, brown well-graded SAND with gravel (SW), brick, mps = 1.0 in., damp	10	5	30	30	20	5				
	5																
	5																
	5	6	4.0				-FILL-										
					5.0												
5	2	S2	5.0			SW-SM	Medium dense, brown well-graded SAND with silt and gravel (SW-SM), brick and concrete fragments, mps = 1.0 in., damp	5	10	20	40	15	10				
	14																
	12																
	8	15	7.0				-FILL-										
					8.2												
	50/.1	S3	9.0				Very dense, gray-brown gravel fragment with sand- probable cobble										
10		<1	9.1														
					10.5		-FILL-										
	70	S4	10.5		10.6	SM	Very dense, brown silty SAND (SM), mps = 0.2 in., damp -GLACIAL TILL-			25	30	30	15				
	5		11.0		11.0		Very dense, gray weathered SCHIST, dry -WEATHERED BEDROCK-										
							Split spoon refusal at 11.0 ft.										
							Bottom of exploration at 11.0 ft. below ground surface										
15																	
20																	
25																	
30																	

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth in feet to: Bottom of Casing	Bottom of Hole	Water
3/21/2007	1258		10.5	11.0	Dry

Sample ID

O Open End Rod
T Thin Wall Tube
U Undisturbed Sample
S Split Spoon Sample
G Geoprobe

Well Diagram

Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary

Overburden (Linear ft.)	10.6
Rock Cored (Linear ft.)	--
Number of Samples	4S

BORING NO. B4

Field Tests

Dilatancy: R - Rapid S - Slow N - None
Toughness: L - Low M - Medium H - High
Plasticity: N - Nonplastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High V - Very High

*NOTE: Maximum Particle Size is determined by direct observation within the limitations of sampler size.

NOTE: Soil identifications based on visual-manual methods of the USCS system as practiced by Sebago Technics, Inc.

SebagoTechnics
Engineering Expertise You Can Build On

Supplemental Report on Subsurface and Foundation Investigation

Proposed Oak Street Apartments
Portland, Maine

for

Avesta Housing/Maine Affordable Housing Coalition
307 Cumberland Avenue
Portland, ME 04101

March 5, 2010

One Chabot Street, P.O. Box 1339, Westbrook, Maine 04098-1339 ☎ Ph. 207-856-0277 ☎ Fax 856-2206

Sebago Technics
Engineering Expertise You Can Build On

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Fax 856-2206

March 5, 2010
07156

Mr. Greg Payne
Avesta Housing/Maine Affordable Housing Coalition
307 Cumberland Avenue
Portland, ME 04101

Subsurface and Foundation Investigation
Proposed Oak Street Apartments, Portland, Maine

Dear Greg:

This report presents the results of our subsurface and foundation investigation for the proposed Oak Street Apartments in Portland, Maine. These services were provided in accordance with our proposal dated March 1, 2010. As you know, we completed a subsurface and foundation investigation for another building at this site. This report is for our re-evaluation of subsurface conditions and foundation requirements for the apartment building you propose.

In summary, it is our opinion that the proposed building may be supported on spread and continuous footings bearing on undisturbed, naturally deposited soil, improved existing fill or on compacted structural fill placed after excavation and replacement of unsuitable soil. In addition, an earth-supported slab-on-grade may be used for the ground floor. Specific recommendations for foundation design and construction considerations are presented below.

Introduction

The site is located at 70-82 Oak Street in Portland, Maine. The site is presently a paved parking lot. Ground surface elevations within the site limits vary from approximately El. 105 to El. 108. We understand that the building will be a 4-story structure with no basement having a plan area of approximately 8,400 square feet. The lowest (ground) floor has not yet been established but will likely be at approximately El. 106 to El. 107.

Subsurface Explorations

On March 21, 2007, Maine Test Borings, Inc. (MTB) of Brewer, Maine drilled four borings, B1 to B4, at the site at locations shown on Sheet 1, Boring Plan. MTB drilled the borings to depths below ground surface varying from 6.1 feet to 11.0 feet. Sebago Technics, Inc. monitored the borings and prepared the logs included in Appendix A. Table I summarizes the results of borings. MTB backfilled the borings with the drilled soil and placed a temporary bituminous patch at the surface.

Borings were drilled using 2.5-inch inside diameter hollow stem augers. Samples were recovered at intervals from 3 feet to 5 feet. Standard penetration resistance, N, was measured at each sample interval in accordance with ASTM procedures. All borings were drilled to split-spoon sampler refusal.

Sebago Technics, Inc. determined the locations of borings by taping from site features. Ground surface elevations at borings were determined by linear interpolation between ground surface contours at the plotted locations.

The boring logs and related information depict the subsurface conditions and water levels encountered at the locations and during the times indicated on the logs. Subsurface conditions at other locations may differ from those encountered in the borings. The passage of time may result in a change in groundwater conditions at the borings.

Subsurface Conditions

The borings encountered three principal soil units below bituminous concrete and overlying bedrock at the site: fill, glacial till and weathered bedrock. Encountered thickness and generalized descriptions of the strata encountered are presented below in order of increasing depth below ground surface. Due to the complexity of the deposition process, strata thickness will vary and may be absent at specific locations.

Fill – Fill consists of very loose to medium dense, brown well-graded SAND (SW); to well-graded SAND with gravel (SW); to well-graded SAND with silt and gravel (SW-SM) with various amounts of brick, glass, clay, concrete fragments, and cobbles. Encountered thickness varies from 5.1 feet to 10.2 feet.

Glacial Till – Glacial till encountered in B3 and B4 consists of very dense, brown silty SAND (SM). Encountered thickness varies from 0.1 foot to 0.6 foot.

Weathered Bedrock – Weathered bedrock consists of gray SCHIST weathered to sand, gravel and cobble size fragments. Encountered thickness varies from 0.4 foot to 3.0 feet.

All borings terminated on split-spoon refusal judged to be bedrock. The approximate elevation of bedrock varies from 95.5 feet to 99.5 feet.

Water was not encountered in the borings. Observations of water were made over a relatively short period of time and may not reflect the stabilized groundwater condition. In addition, water levels at the site will vary with season, precipitation, temperature, and construction activity in the area. Therefore, water levels during and following construction will vary from that observed in the borings.

Recommendations for Foundation Design

Recommended Foundation Type and Design Criteria

The bituminous concrete and existing fill in its present condition is not considered suitable for support of the building or ground floor slab. It is not known whether the fill was placed in layers and systematically compacted. In addition, the fill contains concrete, glass and brick fragments.

In our opinion, the fill will be suitable for support following overexcavation and compaction with large vibratory equipment. We recommend that the building be supported on spread and continuous footings bearing on a minimum of 12 inches of 3/4–inch crushed stone and non-woven geotextile separation fabric placed on the compacted existing fill or on undisturbed, naturally deposited soil.

Footings may be proportioned for an allowable bearing stress in pounds per square foot (psf) equal to 1,000 multiplied by the least lateral dimension of the footing in feet, up to a maximum of 3,000 psf. All footings should be a minimum of 1.5 feet wide.

Exterior footings should be founded at least 4.5 feet below the lowest adjacent ground surface exposed to freezing. Interior footings should be founded a minimum of 1.5 feet below the ground floor slab.

The existing fill consists primarily of well-graded sand with various amounts of brick and concrete fragments, glass and silt. We recommend that the existing fill be removed to approximately 1 foot below the bottom of ground floor slab and that the existing fill below this level be compacted by intensive surface compaction (ISC). We recommend that ISC be performed using a minimum 25,000 pound vibratory roller operating at 30 cycles per second (Hz) and a forward speed of 1 to 2 feet per second. Compaction should consist of 10 coverages of the vibratory roller. The direction of each two successive coverages should be rotated perpendicular to the previous two coverages. Following intensive surface compaction, a minimum of two coverages of the roller should be applied without vibration to recompact the upper surface of the fill soil.

We recommend that the existing fill be removed to 1 foot below the bearing level of footings and the excavated surface be compacted by a minimum of 4 passes of vibratory compaction equipment. Footing excavations should be backfilled to bearing level with ¾-inch crushed stone with a non-woven geotextile separation fabric placed on the compacted existing fill subgrade. The crushed stone should be compacted with a minimum of 2 passes of vibratory compaction equipment.

Crushed stone supporting footings should extend laterally from the footings to at least the limits defined by 1 horizontal to 1 vertical lines sloped outward and downward from points located at least 1 foot horizontally beyond the bottom edges of the footings.

At the recommended bearing stress, we anticipate that settlement of the building will be less than 1.0 inch. We estimate that approximately 50 percent of this settlement will occur following filling and foundation construction. Therefore, settlement during and following completion of the building will be on the order of 0.5 inch. We anticipate that settlement of this magnitude is acceptable. However, Becker Structural Engineers should determine final acceptability of settlement.

Ground Floor Slab

We recommend that the lowest level floor slab be designed as an earth-supported slab-on-grade bearing on a minimum 6 inches of compacted structural fill placed after overexcavation of existing fill and ISC as discussed above. All fill placed below the floor slab for raise-in-grade should consist of compacted structural fill.

Normal dampproofing and vapor barriers should be used below the floor slabs.

We recommend a modulus of subgrade reaction of 200 pounds per cubic inch for ground floor slab design.

Seismic Design Considerations

We recommend that the building be designed in accordance with the seismic requirements of the International Building Code (IBC). We understand that the City of Portland uses the 2003 edition of the IBC. The site classification is Class C; the site response coefficient F_a is 1.2 for a short period spectral response acceleration S_s of 0.37g; the site response coefficient F_v is 1.7 for the 1-second period spectral response acceleration S_1 of 0.10g. The subgrade soils are not considered liquefaction susceptible.

Lateral Foundation Loads

We recommend that lateral loads be resisted by bottom friction on footings. We recommend that a coefficient of friction equal to 0.40 be used for footings. If this does not provide sufficient resistance, we will study the problem in more detail to take into account other factors.

Backfill Materials

Structural fill used below foundations and floor slabs and for backfill adjacent to walls should consist of sandy gravel to gravelly sand. It should be free of organic material, loam, trash, snow, ice, frozen soil and other objectionable material, and should conform to the following gradation:

Sieve Size	Percent Finer by Weight
6 inches	100
No. 4	30 to 90
No. 40	10 to 50
No. 200	0 to 8

Compacted structural fill should be placed in layers not exceeding eight inches in loose measure and compacted by self propelled vibratory equipment at the approximate optimum moisture content to a dry density of at least 95 percent of the maximum dry density, as determined in accordance with ASTM Test Designation D1557. In confined areas, the maximum particle size should be reduced to 3 inches and the loose layer thickness should be reduced to 6 inches and compaction performed by hand-guided vibratory equipment.

Compacted structural fill on the outside of the foundation walls should extend laterally a minimum of 2 feet from the wall. Backfill beyond this limit may consist of common fill. The top 12 inches of fill on the exterior of the building should consist of low permeability material or bituminous pavement or sidewalks to minimize water infiltration next to the building. Grading should provide for runoff away from the building.

Common fill may consist of inorganic mineral soil that can be placed in layers and compacted. Common fill should be placed and spread in layers not exceeding 12 inches in thickness and compacted with a minimum of two systematic passes of the equipment placing the fill.

In our opinion, fill encountered in the explorations is not suitable for structural fill but would be suitable for common fill.

Construction Considerations

General

The primary purpose of this section of the report is to comment on items related to excavation, earthwork and related geotechnical aspects of proposed construction. It is written primarily for the engineer having responsibility for preparation of plans and specifications. Since it identifies potential construction problems related to foundations and earthwork, it will also aid personnel who monitor the construction activity. Prospective contractors for this project must evaluate the construction problems on the basis of their own knowledge and experience in the Portland, Maine area, and on the basis of similar projects in other localities, taking into account their proposed construction methods, procedures, equipment, and personnel.

Excavation, Lateral Support and Control of Water

We anticipate that foundation excavation can be accomplished with sloped open excavation through the overburden soils provided safe side slopes can be maintained. Some sloughing and raveling should be anticipated in temporary slopes. Temporary excavations should be made in accordance with all OSHA and other applicable regulatory agency requirements.

We anticipate that groundwater may be encountered at proposed subgrade level or bearing level of footings. If encountered, open pumping from sumps can likely control groundwater. In general, the contractor should control groundwater and water from runoff and other sources by methods which prevent disturbance of bearing surfaces or adjacent soils and allow construction in-the-dry.

Subgrade Preparation

The subgrade soil is susceptible to disturbance from construction traffic. Equipment and personnel should not be permitted to travel across exposed footing bearing surfaces or exposed slab subgrades. Any subgrade areas that are disturbed should be recompacted or excavated and replaced with compacted structural fill prior to placing concrete. Subgrades should be protected against freezing temperatures if exposed during construction. Final excavation to subgrade should be performed using equipment with smooth-edge buckets.

Construction Monitoring

The foundation recommendations contained herein are based on the known and predictable behavior of a properly engineered and constructed foundation. Monitoring of the foundation construction is required to enable the geotechnical engineer to keep in contact with procedures and techniques used in construction. Therefore, we recommend that a person qualified by training and experience be present to provide monitoring at the site during intensive surface compaction, preparation of foundation bearing surfaces and placement of compacted structural fill.

Limitations of Recommendations

This report has been prepared for specific application to the subject project in accordance with generally accepted geotechnical engineering practices. In the event that any changes in the nature, design or location of the building are planned, the conclusions and recommendations contained in this report should not be considered valid, unless the changes are reviewed and the conclusions of this report modified or verified in writing.

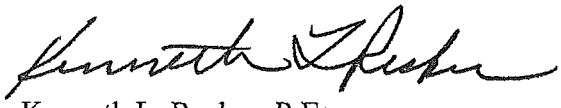
The recommendations presented herein are based in part on the data obtained from the referenced borings. The nature and extent of variations between the explorations may not become evident until construction. If variations then appear evident, it will be necessary to reevaluate the recommendations of this report.

We request that we be provided the opportunity for a general review of final design and specifications in order to determine that our earthwork and foundation recommendations have been interpreted and implemented in the design and specifications as they were intended.

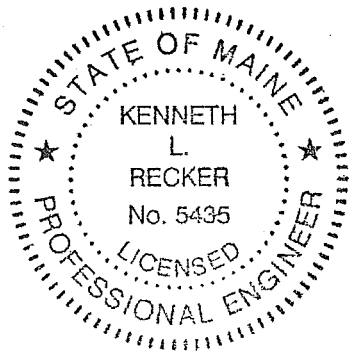
It has been a pleasure to work with you on this project. Please do not hesitate to contact us if you have any questions or need additional information.

Sincerely,

SEBAGO TECHNICS, INC.



Kenneth L. Recker, P.E.
Geotechnical Engineering Manager



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Enclosures:

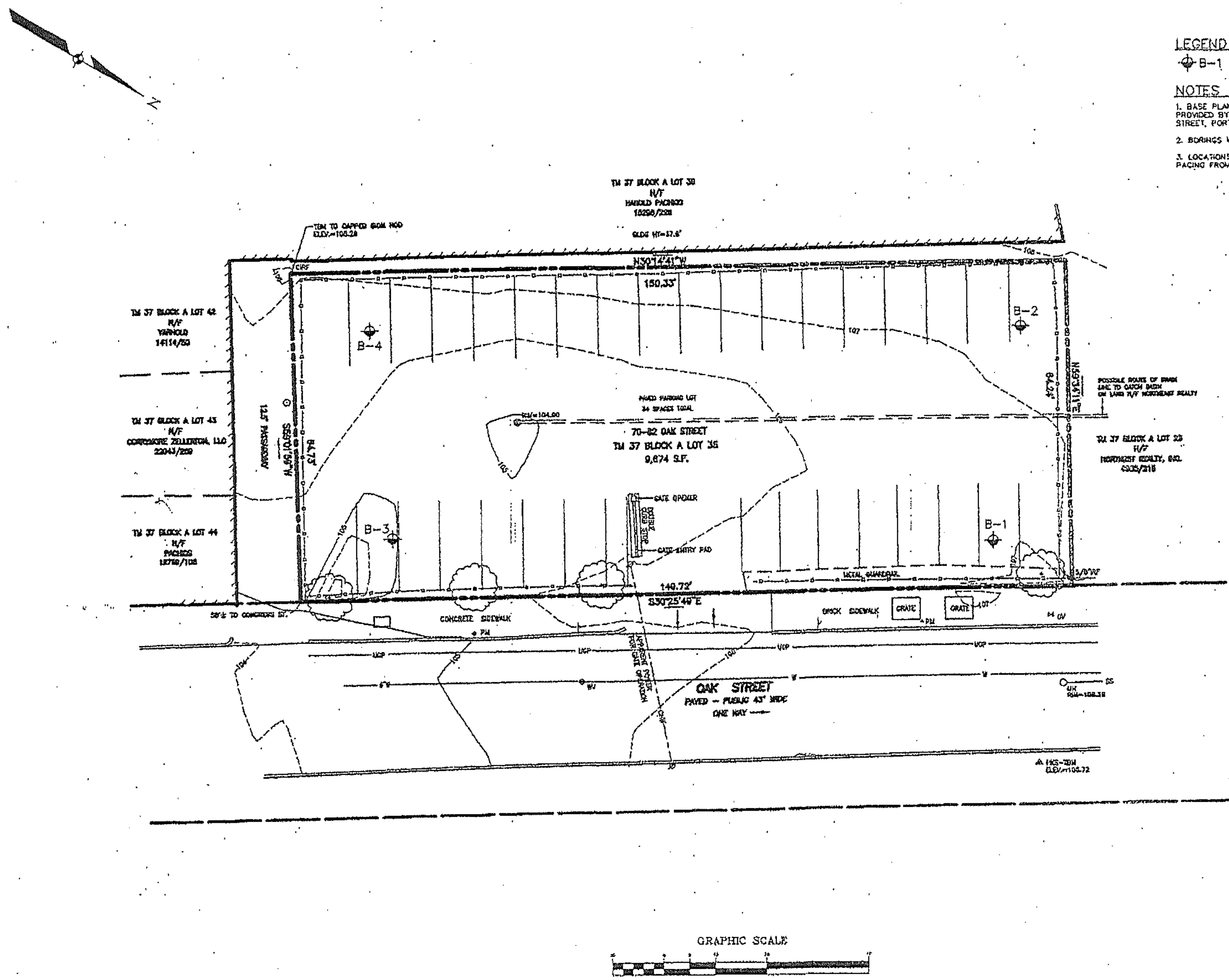
Table I	- Summary of Borings
Sheet 1	- Boring Plan
Appendix A	- Logs of Test Borings

TABLE I
SUMMARY OF BORINGS
PROPOSED OAK STREET APARTMENTS
PORTLAND, MAINE

Boring Number	Depth (Ft)	Approx. Ground Surface El. (Ft)	Depth to Water (Ft)	Strata Thickness (Ft)					Approx. El. Top of Rock (Ft)
				Bituminous Concrete	Fill	Glacial Till	Weathered Bedrock	Bedrock	
B1	10.5	106.8	NE	0.3	7.2	--	3.0	0.0*	96.3
B2	7.0	106.5	NE	0.3	5.1	--	1.6	0.0*	99.5
B3	6.1	105.3	NE	0.3	5.2	0.6	--	0.0*	99.2
B4	11.0	106.5	NE	0.3	10.2	0.1	0.4	0.0*	95.5

NOTES:

1. NE INDICATES GROUNDWATER NOT ENCOUNTERED WITHIN DEPTH OF BORING.
2. -- INDICATES STRATUM NOT ENCOUNTERED WITHIN DEPTH OF BORING.
3. * INDICATES DEPTH OF PENETRATION INTO STRATUM.



LEGEND

B-1 NUMBER AND APPROXIMATE LOCATION OF BORINGS DRILLED BY MAINE TEST BORINGS, INC. ON MARCH 21, 2007.

NOTES

1. BASE PLAN PREPARED FROM ELECTRONIC FILE IN PDF FORMAT PROVIDED BY ARCHETYPE, PA. TITLED TOPOGRAPHIC SURVEY ON OAK STREET, PORTLAND, MAINE, BY OWEN HASKELL, INC.

2. BORINGS MONITORED BY SEBAGO TECHNICS, INC.

3. LOCATIONS OF BORINGS DETERMINED BY SEBAGO TECHNICS, INC. BY PACING FROM EXISTING SITE FEATURES.

REV.	BY	DATE	STATUS

THIS PLAN SHALL NOT BE MODIFIED WITHOUT WRITTEN PERMISSION FROM SEBAGO TECHNICS, INC. ANY ALTERATIONS, AUTHORIZED OR OTHERWISE, SHALL BE AT THE USER'S SOLE RISK AND WITHOUT LIABILITY TO SEBAGO TECHNICS, INC.

Sebago Technics
Engineering Expertise You Can Build On
One Chabot Street
Westbrook, ME 04098-1339
Tel (207) 856-0277

PROJECT NO	FIELD BOOK	DESIGN	CHKD	DRAWN
07135	-	KLR	KLR	MAL

BORING PLAN
OF:
OAK STREET APARTMENTS
70-82 OAK STREET
PORTLAND, MAINE
FOR:
AVESTA HOUSING CORPORATION
307 CUMBERLAND AVENUE
PORTLAND, MAINE 04101

DATE	SCALE
4-4-07	1"=10'

SHEET 1 OF 1

Appendix A

Logs of Test Borings

SEBAGO TECHNICS, INC.

TEST BORING REPORT

BORING NO. **B1**

Page 1 of 1

PROJECT	PROPOSED OAK STREET APARTMENTS	STI JOB NO.	07156
LOCATION	70-82 OAK STREET, PORTLAND, MAINE	PROJECT MGR.	K. RECKER
CLIENT	AVESTA HOUSING CORPORATION	FIELD REP.	K. B. STEPHENSON
CONTRACTOR	MAINE TEST BORINGS, INC.	DATE STARTED	3/21/2007
DRILLER	T. SCHAEFFER	DATE FINISHED	3/21/2007

Elevation 106.8 ft. Datum NGVD29 Boring Location See Plan

Item	Casing	Sampler	Core Barrel
Type	HSA	SS	
Inside Diameter (in.)	2.5	1.375	
Hammer Weight (lb.)		140	
Hammer Fall (in.)		30	

Rig Make & Model: Mobile B53

☑ Truck ☐ Tripod ☑ Cat-Head
☐ ATV ☐ Geoprobe ☐ Winch
☐ Track ☐ Air Track ☐ Roller Bit
☐ Skid ☑ Cutting Head

Hammer Type: ☑ Safety ☐ Doughnut ☑ Automatic

Drilling Mud: ☐ Bentonite ☐ Polymer ☑ None

Casing Advance: Type Method Depth HSA/Spin/10.0

Drilling Notes:

Depth (ft.)	Sampler Blows per 6 in.	Sample No. & Recovery (in.)	Sample Depth (ft.)	Well Diagram	Stratum Change (ft.)	USCS Symbol	Visual-Manual Identification & Description (density/consistency, color, GROUP NAME & SYMBOL, maximum particle size*, structure, odor, moisture, optional descriptions, geologic interpretation)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0					0.3		-BITUMINOUS CONCRETE-										
							Note: brown sand with gravel, concrete, brick, probable cobbles to 2.5 ft.										
							-FILL-										
					2.5												
	6	S1	2.5			SW	Loose, brown well-graded SAND (SW), trace silt, dry			20	50	30					
	3																
	2																
	3	8	4.5				-FILL-										
5																	
	1	S2	5.0			SW	Very loose, brown well-graded SAND (SW), brick, glass, probable cobble	5	5	45	40	5					
	2						fragments, mps = 1.3 in., dry										
	1/12 in.																
		6	7.0				-FILL-										
					7.5												
10																	
	70	S3	10.0				Very dense, gray weathered SCHIST, dry										
	6		10.5		10.5		-WEATHERED BEDROCK-										
							Split spoon refusal at 10.5 ft.										
							Bottom of exploration at 10.5 ft. below ground surface										
15																	
20																	
25																	
30																	

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth in feet to: Bottom of Casing	Bottom of Hole	Water
3/21/2007	1116		10.0	10.5	Dry

Sample ID

O Open End Rod
T Thin Wall Tube
U Undisturbed Sample
S Split Spoon Sample
G Geoprobe

Well Diagram

Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary

Overburden (Linear ft.)	7.5
Rock Cored (Linear ft.)	--
Number of Samples	3S

BORING NO. B1

Field Tests

Dilatancy: R - Rapid S - Slow N - None
Toughness: L - Low M - Medium H - High
Plasticity: N - Nonplastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High V - Very High

*NOTE: Maximum Particle Size is determined by direct observation within the limitations of sampler size.

NOTE: Soil identifications based on visual-manual methods of the USCS system as practiced by Sebago Technics, Inc.

SEBAGO TECHNICS, INC.

TEST BORING REPORT

BORING NO. **B2**

Page 1 of 1

PROJECT	PROPOSED OAK STREET APARTMENTS	STI JOB NO.	07156
LOCATION	70-82 OAK STREET, PORTLAND, MAINE	PROJECT MGR.	K. RECKER
CLIENT	AVESTA HOUSING CORPORATION	FIELD REP.	K. B. STEPHENSON
CONTRACTOR	MAINE TEST BORINGS, INC.	DATE STARTED	3/21/2007
DRILLER	T. SCHAEFFER	DATE FINISHED	3/21/2007

Elevation 106.5 ft | Datum NGVD29 | Boring Location See Plan

Item	Casing	Sampler	Core Barrel
Type	HSA	SS	
Inside Diameter (in.)	2.5	1.375	
Hammer Weight (lb.)		140	
Hammer Fall (in.)		30	

Rig Make & Model: Mobile B53

☑ Truck ☐ Tripod ☑ Cat-Head
☐ ATV ☐ Geoprobe ☐ Winch
☐ Track ☐ Air Track ☐ Roller Bit
☐ Skid ☐ ☑ Cutting Head

Hammer Type: ☑ Safety ☐ Doughnut ☐ Automatic

Drilling Mud: ☐ Bentonite ☐ Polymer ☑ None

Casing Advance: Type Method Depth — HSA/Spin/5.0

Drilling Notes:

Depth (ft.)	Sampler Blows per 6 in.	Sample No. & Recovery (in.)	Sample Depth (ft.)	Well Diagram	Stratum Change (ft.)	USCS Symbol	Visual-Manual Identification & Description (density/consistency, color, GROUP NAME & SYMBOL, maximum particle size*, structure, odor, moisture, optional descriptions, geologic interpretation)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0					0.3		-BITUMINOUS CONCRETE-										
							Note: brown sand with gravel in cuttings to 1.3 ft.										
					1.3		-SUBBASE/FILL-										
					2.0	SW	Note: brown well-graded SAND (SW) in cuttings from 1.3 to 2.0 ft., dry			20	50	30					
	4	S1	2.0			SW	Loose, brown well-graded SAND with gravel (SW), mps = 1.0 in., dry	5	15	40	30	10					
	3																
	2																
	3	16	4.0				-FILL-										
5																	
	5	S2	5.0		5.4	SW	Loose, brown well-graded SAND with gravel (SW), mps = 1.0 in., dry	5	15	40	30	10					
	17						Very dense, brown weathered SCHIST, dry										
	30						-WEATHERED BEDROCK-										
	72	19	7.0		7.0												
							Split spoon refusal at 7.0 ft.										
							Bottom of exploration at 7.0 ft. below ground surface										
10																	
15																	
20																	
25																	
30																	

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth in feet to: Bottom of Casing	Bottom of Hole	Water
3/21/2007	1015		5.0	7.0	Dry

Sample ID

O Open End Rod
T Thin Wall Tube
U Undisturbed Sample
S Split Spoon Sample
G Geoprobe

Well Diagram

Riser Pipe
Screen
Filter Sand
Cuttings
Grout
Concrete
Bentonite Seal

Summary

Overburden (Linear ft.)	5.4
Rock Cored (Linear ft.)	--
Number of Samples	2S

BORING NO. B2

Field Tests

Dilatancy: R - Rapid S - Slow N - None
Toughness: L - Low M - Medium H - High
Plasticity: N - Nonplastic L - Low M - Medium H - High
Dry Strength: N - None L - Low M - Medium H - High V - Very High

*NOTE: Maximum Particle Size is determined by direct observation within the limitations of sampler size.

NOTE: Soil identifications based on visual-manual methods of the USCS system as practiced by Sebago Technics, Inc.

SEBAGO TECHNICS, INC.

TEST BORING REPORT

BORING NO. **B3**

Page 1 of 1

PROJECT	PROPOSED OAK STREET APARTMENTS	STI JOB NO.	07156
LOCATION	70-82 OAK STREET, PORTLAND, MAINE	PROJECT MGR.	K. RECKER
CLIENT	AVESTA HOUSING CORPORATION	FIELD REP.	K. B. STEPHENSON
CONTRACTOR	MAINE TEST BORINGS, INC.	DATE STARTED	3/21/2007
DRILLER	T. SCHAEFFER	DATE FINISHED	3/21/2007

Elevation 105.3 ft. Datum NGVD29 Boring Location See Plan

Item	Casing	Sampler	Core Barrel
Type	HSA	SS	
Inside Diameter (in.)	2.5	1.375	
Hammer Weight (lb.)		140	
Hammer Fall (in.)		30	

Rig Make & Model: Mobile B53

- ☑ Truck ☐ Tripod ☑ Cat-Head
- ☐ ATV ☐ Geoprobe ☐ Winch
- ☐ Track ☐ Air Track ☐ Roller Bit
- ☐ Skid ☐ ☑ Cutting Head

Hammer Type: ☑ Safety ☐ Doughnut ☐ Automatic

Drilling Mud: ☐ Bentonite ☐ Polymer ☑ None

Casing Advance: Type Method Depth — HSA/Spin/5.5

Drilling Notes:

Depth (ft.)	Sampler Blows per 6 in.	Sample No. & Recovery (in.)	Sample Depth (ft.)	Well Diagram	Stratum Change (ft.)	USCS Symbol	Visual-Manual Identification & Description (density/consistency, color, GROUP NAME & SYMBOL, maximum particle size*, structure, odor, moisture, optional descriptions, geologic interpretation)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test Dilatancy	Field Test Toughness	Field Test Plasticity	Field Test Strength
0					0.3		-BITUMINOUS CONCRETE-										
							Note: brown sand with silt and gravel in cuttings to 1.3 ft., mps = 2.0 in.	20	10	30	20	10	10				
							-SUBBASE/FILL-										
					2.0												
	8	S1	2.0			SW	Medium dense, brown well-graded SAND with gravel (SW), mps = 1.0 in.,	10	5	40	30	15					
	10						dry										
	14				3.7		-FILL-										
	16	20	4.0		4.0	CL	Very stiff, gray-brown mottled lean CLAY (CL), organic fibers, dry-FILL-					10	90	N	M	M	
							Note: brown silty sand with gravel, root fibers in cuttings from 4.0 to 5.5										
5							ft., probable cobbles										
					5.5		-FILL-										
	30	S2	5.5			SM	Very dense, gray-brown silty SAND (SM), mps = 0.75 in., damp	5	5	30	30	15	15				
	50/0.1	6	6.1		6.1		-GLACIAL TILL-										
							Split spoon refusal at 6.1 ft. on probable bedrock										
							Bottom of exploration at 6.1 ft. below ground surface										
10																	
15																	
20																	
25																	
30																	

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth in feet to: Bottom of Casing	Bottom of Hole	Water
3/21/2007	1415		5.5	6.0	Dry

Sample ID

- O Open End Rod
- T Thin Wall Tube
- U Undisturbed Sample
- S Split Spoon Sample
- G Geoprobe

Well Diagram

- Riser Pipe
- Screen
- Filter Sand
- Cuttings
- Grout
- Concrete
- Bentonite Seal

Summary

Overburden (Linear ft.)	6.1
Rock Cored (Linear ft.)	--
Number of Samples	2S

BORING NO. B3

Field Tests

Dilatancy: R - Rapid S - Slow N - None

Toughness: L - Low M - Medium H - High

Plasticity: N - Nonplastic L - Low M - Medium H - High

Dry Strength: N - None L - Low M - Medium H - High V - Very High

*NOTE: Maximum Particle Size is determined by direct observation within the limitations of sampler size.

NOTE: Soil identifications based on visual-manual methods of the USCS system as practiced by Sebago Technics, Inc.

SEBAGO TECHNICS, INC.

TEST BORING REPORT

BORING NO. **B4**

Page 1 of 1

PROJECT	PROPOSED OAK STREET APARTMENTS	STI JOB NO.	07156
LOCATION	70-82 OAK STREET, PORTLAND, MAINE	PROJECT MGR.	K. RECKER
CLIENT	AVESTA HOUSING CORPORATION	FIELD REP.	K. B. STEPHENSON
CONTRACTOR	MAINE TEST BORINGS, INC.	DATE STARTED	3/21/2007
DRILLER	T. SCHAEFFER	DATE FINISHED	3/21/2007

Elevation 106.5 ft.	Datum NGVD29	Boring Location See Plan			
Item	Casing	Sampler	Core Barrel	Rig Make & Model Mobile B53	
Type	HSA	SS		☑ Truck ☐ Tripod ☑ Cat-Head	☑ Safety ☐ Doughnut ☐ Automatic
Inside Diameter (in.)	2.5	1.375		☐ ATV ☐ Geoprobe ☐ Winch	☐ Bentonite ☐ Polymer ☑ None
Hammer Weight (lb.)		140		☐ Track ☐ Air Track ☐ Roller Bit	Casing Advance: Type Method Depth: HSA/Spin/10.5
Hammer Fall (in.)		30		☐ Skid ☑ Cutting Head	Drilling Notes:

Depth (ft.)	Sampler Blows per 6 in.	Sample No. & Recovery (in.)	Sample Depth (ft.)	Well Diagram	Stratum Change (ft.)	USCS Symbol	Visual-Manual Identification & Description (density/consistency, color, GROUP NAME & SYMBOL, maximum particle size*, structure, odor, moisture, optional descriptions, geologic interpretation)	Gravel % Coarse	Gravel % Fine	Sand % Coarse	Sand % Medium	Sand % Fine	% Fines	Field Test: Dilatancy	Toughness	Plasticity	Strength
0					0.3		-BITUMINOUS CONCRETE-										
						SW	Note: brown well-graded SAND with gravel (SW), brick, mps = 1.5 in. in cuttings from 0.3 to 2.0 ft.	10	10	30	30	15	5				
							-FILL-										
	6	S1	2.0			SW	Loose to medium dense, brown well-graded SAND with gravel (SW), brick, mps = 1.0 in., damp	10	5	30	30	20	5				
	5																
	5																
	5	6	4.0				-FILL-										
5					5.0												
	2	S2	5.0			SW-SM	Medium dense, brown well-graded SAND with silt and gravel (SW-SM), brick and concrete fragments, mps = 1.0 in., damp	5	10	20	40	15	10				
	14																
	12																
	8	15	7.0				-FILL-										
					8.2												
	50/.1	S3	9.0				Very dense, gray-brown gravel fragment with sand- probable cobble										
10		<1	9.1														
					10.5		-FILL-										
	70	S4	10.5		10.6	SM	Very dense, brown silty SAND (SM), mps = 0.2 in., damp -GLACIAL TILL-			25	30	30	15				
		5	11.0		11.0		Very dense, gray weathered SCHIST, dry -WEATHERED BEDROCK-										
							Split spoon refusal at 11.0 ft.										
							Bottom of exploration at 11.0 ft. below ground surface										
15																	
20																	
25																	
30																	

Water Level Data

Date	Time	Elapsed Time (hr.)	Depth in feet to: Bottom of Casing	Bottom of Hole	Water
3/21/2007	1258		10.5	11.0	Dry

Sample ID

O	Open End Rod
T	Thin Wall Tube
U	Undisturbed Sample
S	Split Spoon Sample
G	Geoprobe

Well Diagram

Riser Pipe; Screen; Filter Sand; Cuttings; Grout; Concrete; Bentonite Seal

Summary

Overburden (Linear ft.)	10.6
Rock Cored (Linear ft.)	--
Number of Samples	4S

BORING NO. B4

Field Tests — Dilatancy: R - Rapid S - Slow N - None; Toughness: L - Low M - Medium H - High; Plasticity: N - Nonplastic L - Low M - Medium H - High V - Very High; Dry Strength: N - None L - Low M - Medium H - High V - Very High

*NOTE: Maximum Particle Size is determined by direct observation within the limitations of sampler size.

NOTE: Soil identifications based on visual-manual methods of the USCS system as practiced by Sebago Technics, Inc.

PHASE I ENVIRONMENTAL SITE ASSESSMENT
70-82 OAK STREET, PORTLAND, MAINE

1.0 EXECUTIVE SUMMARY

Dickenson & Associates (D&A) completed a Phase I ESA for 70-82 Oak Street on a 10,127 square foot parcel of land in Portland, Maine. The Phase I ESA was conducted in accordance with the ASTM Standard E1527-05 (Phase I Environmental Site Assessment Process). The purpose of Phase I ESA is to identify recognized environmental conditions on or adjacent to the subject property that could represent an environmental liability to the subject property.

The subject property is located 70-82 Oak Street in the southeast portion of Portland, Maine (Figure 1). The subject property consists of a 10,127 square foot parcel with an asphalt-paved parking lot located within the parcel footprint. The subject and adjoining properties on Oak Street are zoned as B-3 Business Zone. The subject property is identified as Block A Lot 35 Map 37 and is currently owned by Fuller Rock Island LLC.

The subject property is improved with an asphalt-paved parking lot designated for a total of 32 parking places. An electronic gate controls access to the parking lot and a metal guard rail encloses the parking area.

Public utilities are available to the property including public water and sewer.

No Federal sites were identified on or within the specified search radius of the subject property. No State active landfills uncontrolled hazardous substance sites were identified on or within the specified search radius of the subject property. One brownfield site is located within ½ mile along Marginal Way to the northwest. The brownfield site is downgradient of the subject property and does not present a risk to the subject property.

A total of 184 DEP spill reports were identified for sites within ½ mile of the subject property. Most of these spills were downgradient of the subject property, were minor surface releases that were quickly cleaned up, did not impact groundwater, and do not represent a potential risk for the subject property. The 21 DEP spill sites located within 1/8 mile of the subject property were typically minor releases that were cleaned up to the satisfaction of DEP and do not present a risk to the subject property.

Several State sites and one RCRA Corrective Action sites were identified in the environmental database search. Seven State sites were identified, two within ½ mile and five within 1 mile. The identified RCRA corrective Action site is also one of the seven state sites. All of these sites are clearly downgradient of the subject property and do not present a risk for the subject property.

D&A has performed a Phase I ESA in conformance with the scope and limitations of ASTM Practice E 1527 of 70-82 Oak Street, the subject property. Any exceptions to, or deletions from this practice are described in Section 6.0 of this report. This assessment has revealed no evidence of recognized environmental conditions in connection with the subject property. Based on this Phase I ESA, D&A recommends no further investigation of the subject property.

Structural Statement of Special Inspections – Exhibit A

Project: *Oak Street Efficiencies*

Location: *Oak Street, Portland, Maine*

Owner: *Avesta Oak Street LP, 307 Cumberland Avenue, Portland, ME*

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.

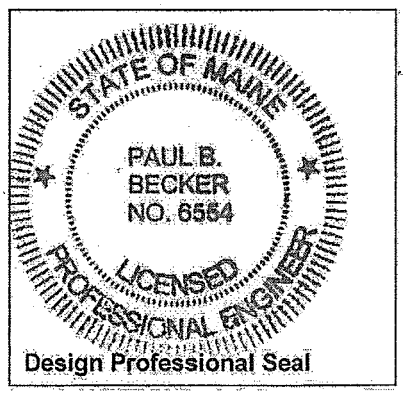
Interim Report Frequency: ☐ *Upon request of Building Official* _____ or ☐ per attached schedule.

Prepared by:

Paul B. Becker, P.E.

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

Signature Date



Design Professional Seal

Owner's Authorization:

Signature Date

Building Code Official's Acceptance:

Signature Date

Structural Statement of Special Inspections (Continued) – Exhibit A

List of Agents

Project: *Oak Street Efficiencies*

Location: *Portland, Maine*

Owner: *Avesta Oak Street LP, Portland, Maine*

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
- ☒ Masonry Systems
- ☒ Structural Steel
- ☒ Wood Construction
- ☐ Special Cases

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

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.

Structural Statement of Special Inspections (Continued) – Exhibit A

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: *Oak Street Efficiencies*

Location: *Portland, Maine*

Owner: *Avesta Oak Street, LP*

Owner's Address: *307 Cumberland Avenue*
Portland, ME 04101

Architect of Record: *Ben Walter* (name) *CWS Architects.* (firm)

Structural Registered Design Professional in Responsible Charge: *Paul B. Becker, P.E.* (name) *Becker Structural Engineers, Inc.* (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) – Exhibit A

Special Inspector's/Agent's Final Report

Project: *Oak Street Efficiencies*

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 Schedule of Special Inspections – Exhibit B

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

Project: Oak Street Efficiencies, Portland, Maine
Date Prepared: August 18, 2010

Structural Schedule of Special Inspections – Exhibit B

SOILS & FOUNDATION CONSTRUCTION

VERIFICATION AND INSPECTION IBC Section 1704.7, 1704.8, 1704.9	Y/N	EXTENT: CONTINUOUS, PERIODIC, SUBMITTAL, OR NONE	COMMENTS	AGENT	AGENT QUALIFICATION	TASK COMPLETED
1. Verify existing soil conditions, fill placement and load bearing requirements						
a. Prior to placement of prepared fill, determine that the site has been prepared in accordance with the approved soils report.	Y	P	IBC 1704.7.1	SI-2	PE/GE	
b. During placement and compaction of fill material, verify material being used and maximum lift thickness comply with the approved soils report.	Y	P	IBC 1704.7.2	SI-2	PE/GE	
c. Test in-place dry density of compacted fill complies with the approved soils report.	Y	P	IBC 1704.7.2	TA-1	PE/GE, EIT or ETT	
2. Pile foundations:						
a. Observe and record procedures for static load testing of piles.	N	C	IBC 1704.8	-	PE/GE, EIT or ETT	
b. Observe and record procedures for dynamic load testing of piles.	N	C		-	PE/GE, EIT or ETT	
c. Record installation of each pile and results of load test. Include cutoff and tip elevations of each pile relative to permanent reference.	N	C		-	PE/GE, EIT or ETT	
d. Test welded splices of steel piles	N	C	AWS D1.1	-	AWS-CWI	
3. Pier foundations: Verify installation of pier foundations for buildings assigned to Seismic Design Category C, D, E or F.	N	C	IBC 1704.9	-	PE/GE, EIT or ETT	
a. Verify pier diameter and length	N	C		-	PE/GE, EIT or ETT	
b. Verify pier embedment (socket) into bedrock	N	P		-	PE/GE, EIT or ETT	
c. Verify suitability of end bearing strata	N	P		-	PE/GE, EIT or ETT	

Structural Schedule of Special Inspections – Exhibit B
CONCRETE CONSTRUCTION

VERIFICATION AND INSPECTION IBC Section 1704.4	Y/N	EXTENT: CONTINUOUS, PERIODIC, SUBMITTAL, OR NONE	COMMENTS	AGENT	AGENT QUALIFICATION	TASK COMPLETED
1. Inspection of reinforcing steel, including prestressing tendons, and placement	Y	C	ACI 318: 3.5, 7.1-7.7	TA-1	PE, EIT, ACI-CCI or ICC-RCSI	
2. Inspection of reinforcing steel welding in accordance with Table 1704.3, Item 5B	N		Welding of Reinf Not Allowed	-	AWS-CWI	
3. Inspect bolts to be installed in concrete prior to and during placement of concrete where allowable loads have been increased	Y	C	IBC 1912.5	TA-1	PE, EIT, ACI-CCI or ICC-RCSI	
4. Verifying use of required design mix	Y	P	ACI 318: Ch 4, 5.2-5.4	TA-1	ACI-CFTT or ACI-STT	
5. At time fresh concrete is sampled to fabricate specimens for strength test, perform slump and air content test and temperature	Y	C	ASTM C 172 ASTM C 31 ACI 318: 5.6, 5.8	TA-1	ACI-CFTT or ACI-STT	
6. Inspection of concrete and shotcrete placement for proper application techniques	Y	C	ACI 318: 5.9, 5.10	TA-1	PE, EIT, ACI-CCI or ICC-RCSI	
7. Inspection for maintenance of specified curing temperature and techniques	Y	P	ACI 318: 5.11-5.13	TA-1	PE, EIT, ACI-CCI or ICC-RCSI	
8. Inspection of Prestressed Concrete						
a. Application of prestressing force.	N	C	ACI 318: 18.20	-	PE/SE or EIT	
b. Grouting of bonded prestressing tendons in seismic force resisting system	N	C	ACI 318: 18.18.4	-	PE/SE or EIT	
9. Erection of precast concrete members	N	P	ACI 318: Ch 16	-	PE/SE or EIT	
10. Verification of in-situ concrete strength, prior to stressing of tendons in post-tensioned concrete and prior to removal of shores and forms beans and structural slabs	N	P	ACI 318: 6.2	-	ACI-STT	

Structural Schedule of Special Inspections – Exhibit B
MASONRY CONSTRUCTION – LEVEL 1 (NON-ESSENTIAL FACILITY)

VERIFICATION AND INSPECTION IBC Section 1704.5	Y/N	EXTENT: CONTINUOUS, PERIODIC, SUBMITTAL, OR NONE	COMMENTS	AGENT	AGENT QUALIFICATION	TASK COMPLETED
1. As masonry construction begins, the following shall be verified to ensure compliance:						
a. Proportions of site-prepared mortar.	Y	P	ACI530.1, 2.6A	TA-1	PE, EIT, ACI-CCI or ICC-SMSI	
b. Construction of mortar joints.	Y	P	ACI530.1, 3.3B	TA-1	PE, EIT, ACI-CCI or ICC-SMSI	
c. Location of reinforcement and connectors.	Y	P	ACI530.1, 3.4, 3.6A	TA-1	PE, EIT, ACI-CCI or ICC-SMSI	
d. Prestressing technique.	N	P	ACI530.1, 3.6B	-	PE/SE or EIT	
e. Grade and size of prestressing tendons and anchorages.	N	P	ACI530.1, 2.4B, 2.4H	-	PE/SE or EIT	
2. The inspection program shall verify:						
a. Size and location of structural elements.	Y	P	ACI530.1, 3.3G	SI-1	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.	Y	P	ACI530, 1.2.2(e), 2.1.4, 3.1.6	SI-1	PE/SE or EIT	
c. Specified size, grade and type of reinforcement.	Y	P	ACI530, 1.12, ACI530.1, 2.4, 3.4	TA-1	PE, EIT, ACI-CCI or ICC-SMSI	
d. Welding of reinforcing bars.	N	N/A	AC530, 2.1.10.6.2, 3.2..4 (b)	--	AWS-CWI	
e. Protection of masonry during cold weather (temperature below 40°F) or hot weather (temperature above 90°F).	Y	P	IBC 2104.3, 2104.4; ACI530.1, 1.8C, 1.8D	TA-1	PE, EIT, ACI-CCI or ICC-SMSI	
f. Application and measurement of prestressing force.	N	N/A	ACI530.1, 3.6B	--	PE/SE or EIT	
3. Prior to grouting, the following shall be verified to ensure compliance:						
a. Grout space is clean.	Y	P	ACI530.1, 3.2D	TA-1	PE, EIT, ACI-CCI or ICC-SMSI	
b. Placement of reinforcement and connectors and prestressing tendons and anchorages.	Y	P	ACI530, 1.12, ACI530.1, 3.4	TA-1	PE, EIT, ACI-CCI or ICC-SMSI	
c. Proportions of site-prepared grout and prestressing grout for bonded tendons.	Y	P	ACI530.1, 2.6B	TA-1	PE, EIT, ACI-CCI or ICC-SMSI	
d. Construction of mortar joints.	Y	P	ACI530.1, 3.3B	TA-1	PE, EIT, ACI-CCI or ICC-SMSI	
4. Grout placement shall be verified to ensure compliance with code and construction document provisions.	Y	P	ACI530.1, 3.5	TA-1	PE, EIT, ACI-CCI or ICC-SMSI	
a. Grouting of prestressing bonded tendons.	N	C	ACI530.1, 3.6C	-	PE/SE or EIT	
5. Preparation of any required grout specimens, mortar specimens and/or prisms shall be observed.	Y	P	IBC 2105.2.2, 2105.3; ACI530.1, I.4	TA-1	PE, EIT, ACI-CCI or ICC-SMSI	
6. Compliance with required inspection provisions of the construction documents and the approved submittals shall be verified.	Y	P	ACI530.1, 1.5	SI-1**	PE/SE or EIT	

**Becker Structural Engineers will provide as a part of our Basic Service

Structural Schedule of Special Inspections – Exhibit B - STEEL CONSTRUCTION

VERIFICATION AND INSPECTION IBC Section 1704.3	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.	Y	P	Applicable ASTM material specifications; AISC 335, Section A3.4; AISC LRFD, Section A3.3	TA-1	AWS/AISC-SSI	
b. Manufacturer's certificate of compliance required.	Y	S		SI-1**	PE/SE or EIT	Basic Services
2. Inspection of high-strength bolting						
a. Bearing-type connections.	Y	P	AISC LRFD Section M2.5 IBC Sect 1704.3.3	TA-1	AWS/AISC-SSI	
b. Slip-critical connections.	Y	C		TA-1	AWS/AISC-SSI	
3. Material verification of structural steel (IBC Sect 1708.4):						
a. Identification markings to conform to ASTM standards specified in the approved construction documents.	Y	P	ASTM A 6 or ASTM A 568 IBC Sect 1708.4	TA-1	AWS/AISC-SSI	
b. Manufacturers' certified mill test reports.	Y	S	ASTM A 6 or ASTM A 568 IBC Sect 1708.4	SI-1**	PE/SE or EIT	Basic Services
4. Material verification of weld filler materials:						
a. Identification markings to conform to AWS specification in the approved construction documents.	Y	P	AISC, ASD, Section A3.6; AISC LRFD, Section A3.5	TA-1	AWS-CWI	
b. Manufacturer's certificate of compliance required.	Y	S		SI-1	PE/SE or EIT	
5. Submit current AWS D1.1 welder certificate for all field welders who will be welding on this project.	Y	S	AWS D1.1	SI-1**	PE/SE or EIT	Basic Service
6. Inspection of welding (IBC 1704.3.1): a. Structural steel:						
1) Complete and partial penetration groove welds. NOTE: For extent marked "C", Agent must be present to observe full welding process	Y	C	AWS D1.1	TA-1	AWS-CWI	
2) Multipass fillet welds.	Y	C		TA-1	AWS-CWI	
3) Single-pass fillet welds> 5/16"	Y	C		TA-1	AWS-CWI	
4) Single-pass fillet welds< 5/16"	Y	P		TA-1	AWS-CWI	
5) Floor and deck welds.	Y	P	AWS D1.3	TA-1	AWS-CWI	
b. Reinforcing steel (IBC Sect 1903.5.2):						
1) Verification of weldability of reinforcing steel other than ASTM A706.	N	C		-		
2) Reinforcing steel-resisting flexural and axial forces in intermediate and special moment frames, and boundary elements of special reinforced concrete shear walls and shear reinforcement.	N	C	AWS D1.4 ACI 318: 3.5.2	-	AWS-CWI	
3) Shear reinforcement.	N	C		-	AWS-CWI	
4) Other reinforcing steel.	N	P		-	AWS-CWI	

Continued on Next page

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.	Y	P		SI-1	PE/SE or EIT	
b. Member locations.	Y	P		SI-1	PE/SE or EIT	
c. Application of joint details at each connection.	Y	P		SI-1	PE/SE or EIT	

**Becker Structural Engineers will provide as a part of our Basic Service

Structural Schedule of Special Inspection Services – Exhibit B

FABRICATION AND IMPLEMENTATION PROCEDURES – STRUCTURAL STEEL

VERIFICATION AND INSPECTION IBC Section 1704.2	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	Y	S	Fabricator shall submit one of the two qualifications	SI-1	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	S	IBC 1704.2.2	SI-1	PE/SE or EIT	

Structural Schedule of Special Inspection Services – Exhibit B
FABRICATION AND IMPLEMENTATION PROCEDURES – WOOD TRUSSES

VERIFICATION AND INSPECTION IBC Section 1704.2	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.	Y	S	Fabricator shall submit one of the two qualifications	SI-1	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	S	IBC 1704.2.2	SI-1	PE/SE or EIT	

Structural Schedule of Special Inspections – Exhibit B
WOOD CONSTRUCTION

VERIFICATION AND INSPECTION IBC Section 1704.6	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	Y	P	IBC 1704.6	SI-1-	PE/SE or EIT	
b. Verify the nominal size of framing members at adjoining panel edges	Y	P	IBC 1704.6	SI-1	PE/SE or EIT	
b. Verify the nail or staple diameter and length	Y	P	IBC 1704.6	SI-1	PE/SE or EIT	
b. Verify the number of fastener lines	Y	P	IBC 1704.6	SI-1	PE/SE or EIT	
b. Verify the spacing between fasteners in each line and at edge margins	Y	P	IBC 1704.6	SI-1	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	S	IBC 1715 [submit ICBO report(s)]	-	PE/SE or EIT	

Structural Schedule of Special Inspections – Exhibit C

SEISMIC RESISTANCE - STRUCTURAL

VERIFICATION AND INSPECTION IBC Section 1707	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:			Seismic Design Category: B			
a. The seismic-force-resisting systems in structures assigned to Seismic Design Category C, D, E or F	N	P	IBC 1707.1	SI-1	PE/SE or EIT	
2. Structural steel: Continuous special inspection for structural welding in accordance with AISC 341. Note: Agent must be present to observe certain welding process.	N	C***	IBC 1707.2	TA-1	AWS-CWI	
3. Structural wood:						
a. Continuous special inspection during field gluing operations of elements of the seismic-force-resisting system.	N	C	IBC 1707.3	-	PE/SE or EIT	
b. Periodic special inspections for nailing, bolting, anchoring and other fastening of components within the seismic-force-resisting system, including drag struts, braces and hold-downs	Y	P	IBC 1707.3	SI-1	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, including struts, braces, and hold-downs	N	N		-		
4. 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	N	IBC 1707.8	-		

*** per 1707.2 welding per AISC 341 shall be continuously inspected except:
Single pass fillet welds less than 5/16"
Floor and Roof Deck Welding

Quality Assurance Plan – Seismic and Wind – Exhibit C

QUALITY ASSURANCE FOR SEISMIC RESISTANCE CHECK LIST [IBC 1705]

Seismic Design Category	**B**

☐ FOR SEISMIC DESIGN CATEGORY C OR HIGHER:

Structural:

☐ The seismic-force-resisting systems
- ☐ Steel Braced Frames and associated connections/anchorage
- ☐ Steel Moment Frames and associated connections
- ☐ Shear walls: ☐ CMU ☐ Wood ☐ Concrete ☐ Diaphragms: ☐ Floor ☐ Roof
- ☐ Other:

QUALITY ASSURANCE FOR WIND RESISTANCE CHECK LIST [IBC 1706]

Wind Exposure Category	**B**

REQUIRED	NOT REQUIRED	NOT APPLICABLE	QUALITY ASSURANCE PLAN REQUIREMENTS (A Quality Assurance Plan is required where indicated below)
☐	☒	☐	In wind exposure Categories A and 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.

Prepared by:

Signature Date

Building Code Official's Acceptance:

Signature Date

Contractor's Statement of Responsibility – Exhibit D

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 to the Building Official and the Owner prior to the commencement of work on the system or component. The Statement of Responsibility is required for Seismic Design Category C or higher. Make additional copies of this form as required.

Project: **Oak Street Efficiencies**

Contractor's Name: Wright – Ryan Construction

Address: 10 Danforth Street, Portland, ME 04101

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

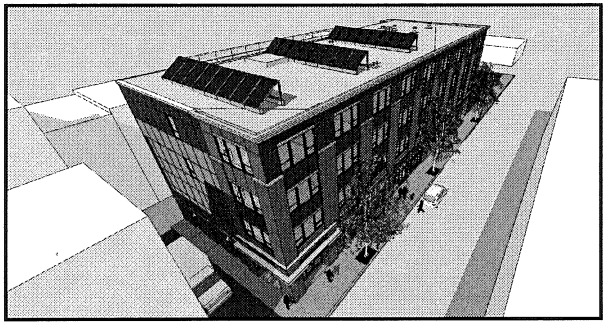
Procedures for exercising control within the contractor's organization, the method and frequency of reporting and the distribution of reports is attached to this Statement.

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

48" x 96" Construction Signs on Luster Board
(See Specification 10 14 00)

The Future Site of

Oak Street Efficiencies



AVESTA HOUSING

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Architecture • Planning
Construction Services

Portland, Maine
Tel (207) 774-4441
www.CWSarch.com

Mitchell & Associates
LANDSCAPE ARCHITECTS

BECKER

BENNETT ENGINEERING

WR Wright-Ryan

10 Danforth Street
Portland, ME 04102
(207) 772-3625

MaineHousing
Maine State Housing Authority

353 Water Street
Augusta, ME 04330
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389 Congress Street
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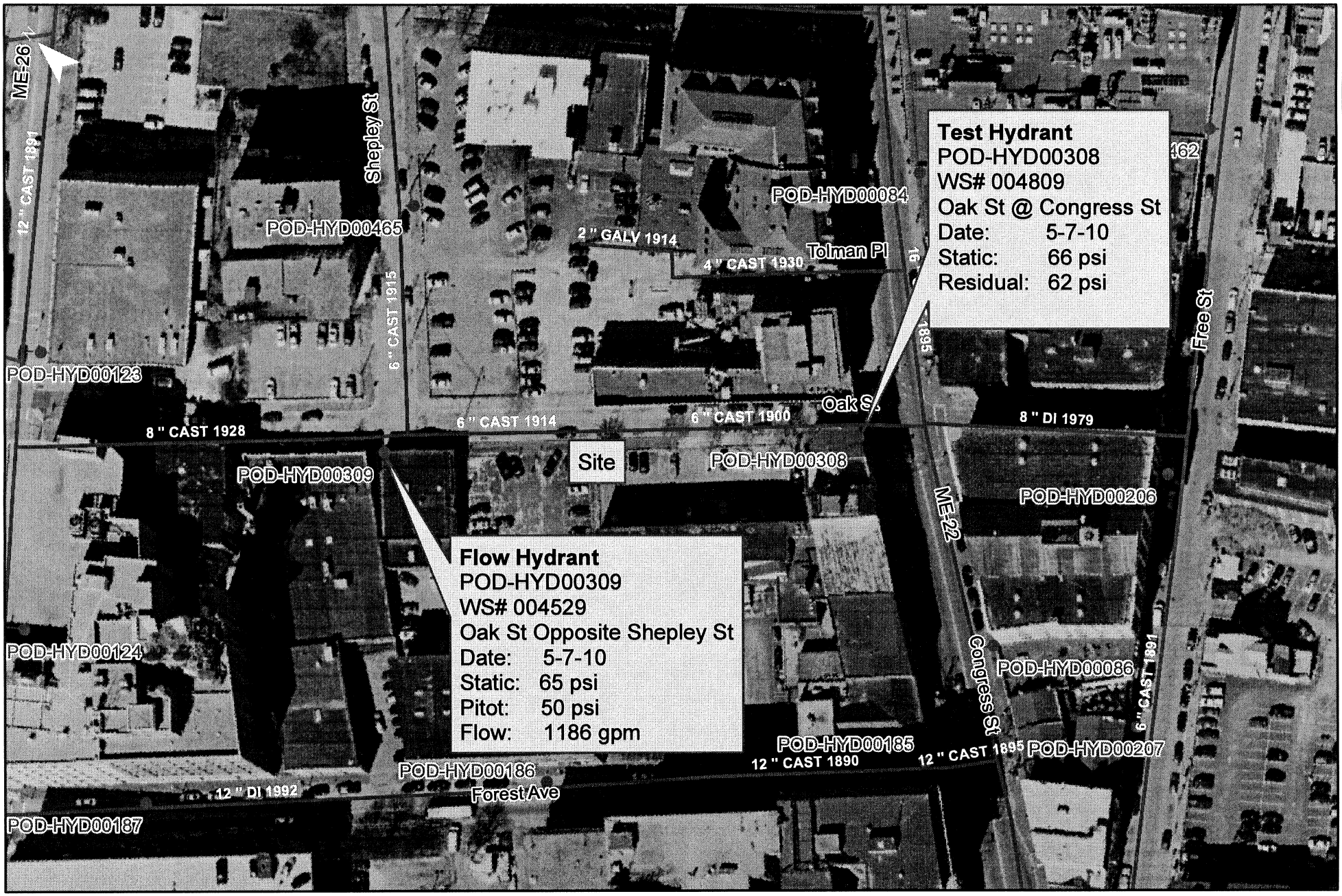


1 inch = 100 feet

PORTLAND WATER DISTRICT **225 Douglass Street** **Portland, ME 04104**	Drawn By: DPW Date: 5-10-2010	Scale: As Noted	**72 Oak Street** **Portland**	Disclaimer: This map is suitable for preliminary study and analysis and is based on PWD record information. PWD is not liable for any damages whatsoever resulting from inaccurate data or from errors made in the location and marking of its infrastructure.	Prepared for: Avesta Housing Sheet No. 1 of 1

Oak Street Apartments					**CWS Architects**
72 Oak St, Portland, Maine					**10-Aug-10**
Principal Codes, Standards and Review Authorities Applicable to Project:					
Program (Owner):	**A.**	Avesta Housing	Greg Payne		Phone: 207-553-7777
		307 Cumberland Ave	Development Officer		Fax: 207-553-7778
		Portland, ME 04101			
Land Use:	A.	Portland Zoning Ordinance	Marge Schuckel		Phone: 874-8719
		Portland Planning Department			
IBC Building Code Review:	A.	ICC: International Building Code, 2003 edition			
		City of Portland Code Enforcement Office			Phone: 874-8703
	B.	Portland Fire Department			Phone: 874-8400
					Fax: 874-8410
NFPA Fire Code Review:	A.	NFPA including 101 Life Safety Code, 2006 edition, NFPA 1			
		State Fire Marshall's Office			Phone: 624-8744
					Fax: 624-8767
	B.	Portland Fire Department			Phone: 874-8400
					Fax: 874-8410
Accessibility:	A.	ICC: International Building Code, 2003 edition (Per City of Portland)			Phone: 874-8703
		Portland Code Enforcement Officer			Fax: 874-8716
	B.	ANSI 117.1 – 1998 per IBC 2003			
	C.	Maine Human Rights Act, ANSI A117.1 – 1986			Phone: 624-8744
		State Fire Marshalls Office			Fax: 624-8767
Mechanical:	A.	International Mechanical Code, 2003 Edition			Phone: 874-8703
		Portland Code Enforcement Officer			Fax: 874-8716
Plumbing:	A.	Maine State Plumbing Code			Phone: 874-8703
		Portland Code Enforcement Officer			
Electrical:	A.	National Electrical Code, 2005 Edition			Phone: 874-8694
		Portland Code Enforcement Officer			Fax: 874-8716
Public Works – Traffic:	A.	Site Plan Review			Phone: 874-8891
		Traffic Engineer			
Public Works – Engineering:	A.	Technical and Design Standards Guidelines, City of Portland			Phone: 874-8846
					Fax: 874-8852

Code Analysis

	IBC 2003		NFPA 101 - 2003		
Category	**Reference**	**Code Requirements**	**Reference**	**Code Requirements**	**Proposed**
Use Group	310.0	R-2 Apartments	6.1.8.1.5	Residential - New Apartment Building, Re: 30.1.1.2	37 apartments
		S-2 Parking		Storage (Parking) Incidental to Residential	
		A-2 Assembly	6.1.2	New Assembly, Re: 12.1.3	For Egress Calcs
Building Construction	Table 602				
	Ground Level	Type 2B - Non-Combustible Unprotected	12.1.6	Assembly (First Floor) - Permitted, Type II (000) Provided	Unprotected Steel Frame & Concrete Deck
			42.1.6	Storage, Incidental to Residential - No Requirements, Type II (000) Provided	
	Upper Three Levels	Type 5A - Combustible Protected	30.1.6	New Apartment Buildings - No Requirements, Type V (111) Provided	Protected Wood Frame
				Assembly (Second Floor) - Permitted, Type V (111) Provided	
Height & Area Limitations	Table 503	See IBC 2003 - Code Calculations			Sprinklered - NFPA 13
Height Modifications	504.2	See IBC 2003 - Code Calculations			
Maximum allowable height		4 stories* / 70'			
Area Modifications	506.2	See IBC 2003 - Code Calculations			
	506.3	See IBC 2003 - Code Calculations			7,533 SF 1st floor
Maximum allowable area	506.1	See IBC 2003 - Code Calculations			29,563 SF total
Fire Ratings	302.3.1	Non-separated uses. See IBC 2003 - Code Calculations	6.1.14.1.3 (1)	Storage Occupancy Load @ 500 SF per person = 9 Occupants; Permitted as an incidental use to the Apartment Occupancy	As determined by Table 7.3.1.2
			6.1.14.2.3	Assembly to New Apartment Building - Separated Occupancies by Fire Resistance Rated Asseblies	1 Hour fire risistance rated assembly required
			Separation Walls	1 Hour Fire Separation Assembly	PROVIDED
			Separation Floor/Ceiling	1 Hour Fire Separation Assembly	PROVIDED
	Table 601	Fire Resistance Rating Requirements for Building Elements	Table 8.2.1.2	Fire Resistance Ratings for Type 1 through Type V Construction (hours)	See IBC 2003 - Code Calculations
	Table 1016.1	Exit access corridors - 1/2 hour (with sprinkler system)	30.3.6.1.2	Exit access corridors - 1/2 hour	1/2 hour (1 hour protected wood frame provided)

			30.3.6.2	Exit access corridor doors - 20-minute self-closing & latching	20 minute doors, spring hinges
	1019.1	Fire Enclosure of 4 story Vertical Exit Enclosures - 2 hour	30.2.2.1.2	Exits: 2 Hour (Sprinklered)	2 hour
	707.4	4 story Shafts & Elevator Hoistways - 2 hr	30.3.1.1.4	Shafts: 2 Hour (Sprinklered)	2 hour
	708.3	Dwelling Unit Separation Walls - 1 hour	30.3.7.2	Dwelling Unit Separation Walls - 1 hour	1 hour
	711.3	Dwelling Unit Separation Floor/Ceiling - 1 hour			1 hour
	Table 302.1.1	Boiler Rooms over 10 HP - 1 hour or automatic fire extinguishing	T 30.3.2.1.1	Boiler Rooms - 1 Hour and sprinkler	1 Hour & Sprinklered
	Table 302.1.1	Laundry Rooms over 100 s.f. - 1 hour or automatic fire extinguishing	T 30.3.2.1.1	Laundries over 100 s.f. - 1 hour and sprinklers with smoke partitions	Sprinklered
	Table 302.1.1	Storage Rooms over 100 s.f. - 1 hour or automatic fire extinguishing	T 30.3.2.1.1	Storage rooms outside of dwelling units - 1 hour OR sprinklers with smoke partitions	Sprinklered
	Table 302.1.1	Waste Collection Rooms over 100 s.f. - 1 hour or automatic fire extinguishing			Sprinklered
	Table 302.1.1	Parking Garage - 0 hour and automatic fire extinguishing per 302.3.1			1 Hour and Sprinklered
Opening Protectives	Table 715.3	1 hour and 1/2 hour rated Exit access corridors - 20 min.	30.3.6	Exit access corridor doors - 20-minute self-closing & latching	20 min.
	Table 715.3	1 Hour Barriers - 45 min.			45 min.
	Table 715.3	1 Hour Shafts & Exits - 60 min.			60 min.
	Table 715.3	2 Hour Shafts & Exits - 90 min.			90 min.
Wired Glass Panels	Table 715.4.3	20 min. opening = Not limited			As required
		3/4 hour opening = 1296 sq in			As required
		1-1/2 hour opening = 100 sq in			As required
Interior Flame Spread Index	Table 803.5	Required vertical exits and passageways C	30.3.3.2	In exits - Class A	As required
	Table 803.5	Corridors providing exit access - C	30.3.3.2	Lobbies and corridors - Class A or B	As required
	Table 803.5	Rooms or enclosed spaces - C	30.3.3.2	Other Spaces - Class A, B or C	As required
			30.3.3.3	Exit enclosures and corridor floors - Class I or II	As required
Occupant Load	T 1004.1.2	Residential Occupancy = 1/200 GSF	T7.3.1.2	Residential Apartment occupant load = 1/200 SF	Refer to IBC 2003 Code Calculations, NFPA the same.
	T 1004.1.2	Storage areas, mechanical equipment rooms = 1/300 GSF		Storage areas, mechanical equipment rooms = 1/300 GSF	
		Assembly, Concentrated (Tables & Chairs) = 1/7 NSF		Assembly, Concentrated (Tables & Chairs) = 1/7 NSF	

Means of Egress					Refer to IBC 2003 Code Calculations, NFPA the same.
Emergency Lighting	1011.1 (exc. #2)	Exit Signs are required except at main exterior exit doors	7.10.1.2	Exit Signs are required except at main exterior exit doors	Provided
	1006.1	Emergency lighting is required except in dwelling units	30.2.9	Emergency lighting is required	Provided
Fire Suppression Systems	903.3.1.1	NFPA 13 Required	30.3.5	NFPA 13 Required	13 Provided
Standpipes	905.3	Not Required		Not Required	Not Provided
Fire Alarm Systems	907.2.9	Required	30.3.4.1.3	Required	Provided
Smoke Detetectors	907.2.10.1.2	Required	30.3.4.5.1	Required outside every sleeping area	Provided
Extinguishment requirements	906	Portable fire extinguishers shall be installed as per NFPA 10	30.3.5.11	Not Required	Provided
Elevators	**Section**	**Summary Discription**			
Construction	707.14	Constructed per 707.4, 2 Hour if 4 stories or more			
Lobby	707.14.1	Elevator Lobby separation from corridor not required per Exception 4: Not more than 4 stories and Automatic Sprinkler per 903.3.1.1 or 2 (903.3.1.1 provided).			
	715	2 Hour Shaft Openings: 1 1/2 Hour			
Means of Egress	1003.7	Elevators shall not be used as a Means of Egress, Exception: if required as an accessible means of egress per 1007.4.			
	1007.1	Two accessible means of egress required, provided by two exit stairs (1007.2, component 2)			
	1007.2.1	Required accessible floors located 4 or more stories above the level of exit discharge must have an elevator as a required means of egress. (Fourth story accessiblity not required per 1107.7.1.1)			
	1007.3	Enclosed Exit Stairways (Accessible): Clear width of 48", Area of Refuge required.			
	1007.4	For Elevators to be considered for Means of Egress, must have Standby Power per 2702 and 3003 and be accessed from Area of Refuge per 1007.6.			
	1107.7.1.1	At least one story containing dwelling units shall have Type B units (other stories not REQUIRED to be accessible). They upper stories are provided with an accessible route and dwelling units in conformance with 1107 on a voluntary basis.			
Accessibility	1109.6	Passenger Elevators accessible if on accessible route and comply with 3001.3 (IIC A117.1)			
Car Size	3002.4	Accommodate Ambulance Stretcher - 24" x 76", 3" high Star of Life symbol both sides of door frame.			
Standby Power	2702.2.5	Not required because no required Elevator as Means of Egress.			
	2702.2.18	Not required because no required Elevator as Means of Egress.			
Emergency Operations	3003	Not required because no required Elevator as Means of Egress.			

Oak Street Apartments				**CWS Architects**
72 Oak Street, Portland, Maine				
International Building Code 2003 - Code Calculation				**August 10, 2010**
Description of Building's Function and Program				
The four-story, 37 unit apartment building will be of new construction. The first story includes a secure open private parking garage and limited common use spaces that provides support to the building's primary residential apartments use located on the three upper floors.				
Floor Plate - Floor 1	7,533			
Floor Plates - Floors 2-4	7,343			

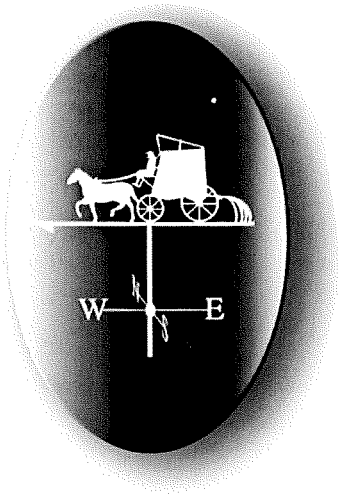
Section 302 - Classification	**Table 302.3.2**	**Reduction per 903.3.1.1**	**Notes**	
Section 302.3.1 Non-separated Uses				
S-2 (Parking) to R2 (Residential Apartments)	0 Hour	0 Hour	**Chapter 9 Provided**	
Section 302.3.2 Separated Uses				
S-2 (Parking) to R2 (Residential Apartments	2 Hour	1 Hour	**Not-Provided**	
	Level 1	Level 1	Levels 1+2	Levels 2-4
Buildng Use Summary	Parking S-2	Residential R-2	R-2 Accessory - Assembly	Residential R-2
Number of Floors (Proposed)	1	1	1	3
Level 1	4,373	2,426	734	
Level 2			733	6,610
Level 3				7,343
Level 4				7,343
Total floor area per use (SF)	4,373	2,426	1,467	22,030
Total Building Area	30,296			
Proposed Spinkler Syster	NFPA 13	NFPA 13	NFPA 13	NFPA 13
	Level 1	Level 1	Levels 1	Levels 2-4
Allowable Height and Building Areas Table 503 - Nonseparated Use Analysis	Parking S-2	Residential R-2	R-2 Accessory - Assembly	Residential R-2
Type of Construction - Most Restrictive per 302.3.1	VA	VA	VA	VA
Number of Floors *	5	4	4	4
Building Height (Feet) *	70	70	70	70
Area (Square Feet) **	21,000	12,000	12,000	12,000
* = Number of Floor and Building Height increased per 504.2 Automatic Sprinkler System Increase.				
** = EXCLUDES Area Modifications per 506 (See below)				
CONCLUSION: All proposed Uses (S2, A2 and R2) work withing the most restrictive Construction Type (VA).				
Provided Height and Building Areas Table 503	Parking S-2	Residential R-2	R-2 Accessory - Assembly	Residential R-2
Type of Construction	2B	2B	2B	VA
Number of Floors	1	1	1	4
Building Height (Feet)	14	14	14	50

Oak Street Apartments				**CWS Architects**
72 Oak Street, Portland, Maine				
International Building Code 2003 - Code Calculation				**August 10, 2010**
Description of Building's Function and Program				
The four-story, 37 unit apartment building will be of new construction. The first story includes a secure open private parking garage and limited common use spaces that provides support to the building's primary residential apartments use located on the three upper floors.				
Area (Square Feet)	4,373	2,426	1,467	22,030
Area Modifications 506	Parking S-2	Residential R-2	R-2 Accessory - Assembly	Residential R-2
Type of Construction - Most Restrictive per 302.3.1	VA	VA	VA	VA
Allowable Area (before area increases)	21,000	12,000	12,000	12,000
Allowable tabular area	100%	100%	100%	100%
Increase for frontage	10.51%	10.51%	10.51%	10.51%
Increase for sprinklers (NFPA 13 system)	200%	200%	200%	200%
Total percentage factor	311%	311%	311%	311%
Conversion factor	3.11	3.11	3.11	3.11
Adjusted Allowable Building Area	65,208	37,262	37,262	37,262
Actual building area	7,533	7,533	7,533	7,533
If Actual building area < Adjusted, then OI	OK	OK	OK	OK
Frontage Calculations 506.2	North	South	East	West
Frontage	0.00	0.00	142.80	0.00
Width	N/A	N/A	>30	N/A
	Total of All Wall Faces			
Total Frontage	142.80	142.80	142.80	142.80
Perimeter	402.1	402.1	402.1	402.1
Frontage increase I(f) = 100[F/P-0.25]W/30	10.51%	10.51%	10.51%	10.51%
Section 506.4 Area determinations	Parking S-2	Residential R-2	R-2 Accessory - Assembly	Residential R-2
Total floor area (all stories)	7,533	7,533	7,533	7,533
A. Allowable area per floor (SF)	65,208	37,262	37,262	37,262
B. Number of Applicable Floors	1	1	1	3
C. Tabular area A x B	65,208	37,262	37,262	111,785
If C > Total Building Floor Area, then OI	OK	OK	OK	OK
Table 601 Fire Resistance Ratings (hours)	Parking S-2	Residential R-2	R-2 Accessory - Assembly	Residential R-2
Type of Construction	2B	2B	2B	VA
Structural Frame including Columns	0	0	0	1
Bearing Walls - Exterior	1	1	1	1
Bearing Walls - Interior	1 (c)	1 (c)	1 (c)	1
Nonbearing Walls - Exterior <5' (North Common Wall)	1 (b)	1 (b)	1 (b)	1 (b)
Nonbearing Walls - Exterior >5', <10' (a)	1	1	1	1
Nonbearing Walls - Exterior >10', <30 (a)	0	0	0	1

Oak Street Apartments					**CWS Architects**
72 Oak Street, Portland, Maine					
International Building Code 2003 - Code Calculation					**August 10, 2010**
Description of Building's Function and Program					
The four-story, 37 unit apartment building will be of new construction. The first story includes a secure open private parking garage and limited common use spaces that provides support to the building's primary residential apartments use located on the three upper floors.					
Nonbearing Walls - Exterior >30' (a)		0	0	0	0
Nonbearing Walls - Interior		1 (c)	1 (c)	1 (c)	0
Floor Construction including Beams		0	0	0	1
Roof Construction including Beams		0	0	0	1
Notes:					
a) Rated from the inside only unless under 5' per 704.5.					
b) North Common Wall rated from both sides.					
c) Non-combustible or Fire Retardant Wood (Alternate Price Proposed)					
704.5 Fire-resistance ratings					
Exterior Wall, Rated from inside only if greater than 5', both sides if less than 5'.					
704.8 Allowable area of openings					
Table 704.8					Proposed
Between 0-5' - Unprotected 10% Max, Protected 25% Max					Protected 0% at North Wall (All Floors)
					per 704.8.1: 0' - 0" to property line
Between 5-10' - Unprotected 10% Max, Protected 25% Max					Protected 24.87% at West Wall (First Floor)
					per 704.8.1: 5' - 4" to property line
Between 10-15' - Unprotected 15% Max, Protected 45% Max					Unprotected 11.6% at South Wall
					10' - 4" to centerline of common alley
Between 10-15' - Unprotected 15% Max, Protected 45% Max					Unprotected 14.9% at West Wall (Upper)
					11' - 8" to rear property line
Between 15-20' - Unprotected 25% Max, Protected 75% Max					N/A
Note: All openings provided are less than maximum allowable unprotected openings per IBC 704.8.1.					
Section 707 Shaft Enclosures					
Required fire rating		2 hours			
Provided		2 hours			
Section 708 Fire Partitions					
Required fire rating - dwelling unit separation - NFPA 13R sprinkler system		1 hour			
	Provided - 13R Sprinkler System	1 hour			
	Corridor Separation per Table 1016.1	1/2 hour			
Section 717.4 Draftstopping in Attics					
Not Required: Exception 2, Automatic Sprinkler System per 903.3.1.1 (NFPA Sprinkler System)					
Section 903					
Automatic Sprinkler System Required		Provided per 903.3.1.1			
Section 905					
Standpipe System		Not Required per 905.3.1			
Section 906					

Oak Street Apartments				**CWS Architects**
72 Oak Street, Portland, Maine				
International Building Code 2003 - Code Calculation				**August 10, 2010**
Description of Building's Function and Program				
The four-story, 37 unit apartment building will be of new construction. The first story includes a secure open private parking garage and limited common use spaces that provides support to the building's primary residential apartments use located on the three upper floors.				
Portalble Fire Extinguishing	Provided per International Fire Code/NFPA 101			
Section 907				
Fire Alarm and Detection Systems	Provided - Automatic Fire Alarm System			
Section 1004 Occupant Load	Parking S-2	Residential R-2	R-2 Accessory - Assembly	Residential R-2
Floor area allowance - persons/SF	200	200	15	200
Largest Floor area (SF)	4,373	2,426	734	7,343
Occupancy load per floo	22	12	49	37
Section 1005 Required Egress Width				
Total Stairway Width - 0.3"/person	6.6	3.6	14.7	11.0
Provided (Clear Stairs Width)	48	48	48	48
Egress Doors - 0.2"/person	4.4	2.4	9.8	7.3
Minimum required Width per door leaf	34	34	34	34
Minimum required number of Door Leafs	1	1	2	1
Section 1015 Travel Distance				
	400'	250'	250'	250'
Section 1016.3 Dead End Corridors				
	20'	20'	20'	20'
Section 1018 Number of Exits				
Required	2	2	2	2
Provided	2	2	2	2

Portland Water District



Water and Sewer Construction Specifications and Procedures

Latest Revision: February 1, 2009

225 Douglass Street P.O. Box 3553 Portland, Maine 04104-3553
Phone: 207.774.5961 Fax: 207.761.8307 Web: www.pwd.org

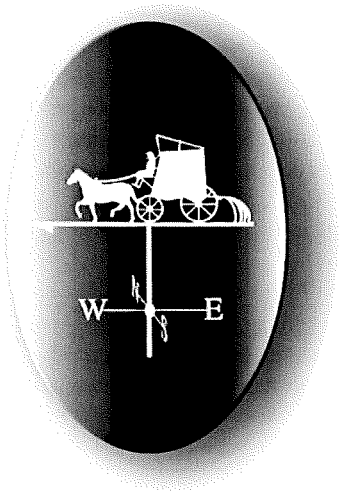
Table of Contents

Portland Water District
Specification Revision Guide

Date	Section	Revision
12/02/03	III	Corporation Material Specification
12/10/03	III	Service Saddle Material Specification
12/10/03	VI	Standard Detail Sheets add S.A. Blow-Off / Revised Blow-Off
05/23/06	III	MJ Field Lok Gasket added as an approved pipe joint restrainer
05/23/06	III	Powerseal Models 3490 and 3490MJ added as approved Tapping Sleeves
05/23/06	III	Restrained Joint Gasket Section added to Materials Specification
05/23/06	I D	Separation of Utilities Updated
05/23/06	II B 2	Depth of Main Cover in Standish, Windham, and Raymond changed to 6'
05/23/06	II	Sanitary Release Form Removed from Specifications
05/23/06	III	Service Saddle - Smith Blair Model 265 approved for PVC pipe
05/23/06	III	Ductile Iron Pipe – 16" pipe and larger to be approved by PWD
05/23/06	II C 4.14	Revised Blowoff Requirement for main/service endings
05/23/06	III	Hydrant Flow Indicator Collars to be placed on new hydrants by PWD
05/23/06	VI	Discontinued Requirement of Polywrapping of Hydrant Barrel
05/23/06	III	IPEX added as an acceptable manufacture of PVC Pipe
05/23/06	VI	Weep hole in blowoff assembly increased in size from 1/16" to 1/8"
05/23/06	III	American Darling Model B62B-5 added as an acceptable hydrant
05/23/06	VI	Standard Trench Detail revised
05/23/06	V C 3 3.01E	Requirement added that sewer force mains shall terminate in MH
05/23/06	V C 3 3.02E	PWD will no longer make taps into sewer manholes, but will require inspection of any connections
05/23/06	III	Service Saddle Specification modified for different pipe materials
05/23/06	II C 4.12	Restrained Joint Gasket requirement added for services with a joint between tap and end of service
05/23/06	II C 6.5	PWD to retain right to determine limits of pressure testing water mains
07/28/06	III	"Blocking Plane" requirement added to Material Spec and Detail Sheet
07/28/06	III	Tapping Sleeves – JCM 415 (or equal) sleeve required for tapping RCCP pipe
07/28/06	I D 4	Min. Separation between water main/service and Utility Pole is 6 feet
07/28/06	III	Service Box (Bibby) and Service Box Cover (QWP) approved
07/28/06	II C 4.12	Minimum size for new water service is 1"
07/28/06	V 3 2.06 Q	Requirement for Standby Generators on all new pump stations added
01/25/07	II C 4.7	PWD reserves the right to specify the use of specialty gaskets
01/25/07	III	Butterfly Valve removed from Specifications. Resilient Seated Gate Valve modified for large diameter applications
01/25/07	III	Service Box Extensions – any extension requires a threaded merchant coupling with no set screw
01/25/07	V C 2.01 C 1	All sewer force mains less than 3" in diameter must be approved by PWD
01/25/07	III and VI	Note stating that valve boxes must have a bottom lip added to Materials Section and emphasized on standard detail
01/25/07	II B 3	Street line gate valve required on connections to mains older than 50 years
01/25/07	II A 1 a	Revised Fire Protection Fee to reflect current hydrant replacement cost
01/25/07	II A 1 g	Added Valve Box Adjustment Deposit requirement for new main extensions

01/25/07	I D 3/4	Vertical separation required between mains and sewers at crossings changed from 18" to 12"
01/25/07	II B 1 & III	All ductile iron water mains and services to be wrapped in polyethylene encasement. Polyethylene encasement material specification modified
01/25/07	III	Atlantic States Pipe added as an approved Ductile Iron Pipe material
01/25/07	VI	Standard Trench Detail revised to note "sand bedding" instead of "select backfill"
9/24/07	II C 7	Disinfectant Requirements
9/24/07	III	Table of Contents: Materials Notes
2/1/09	II A	Fees related to Main Extension Projects

SECTION I: General Information



A. PLANS AND SPECIFICATIONS

1. SUBMITTALS:

An Applicant proposing to construct a water and/or sewerage system for public use and dedication to the Portland Water District shall submit one (1) set of plans and specifications to Asset Management and Planning Department, 225 Douglass Street, Portland ME 04104. The plans shall show plan and profile of the proposed water or sewer main, pump station plans and details, right-of-way boundaries, other utilities, limits of paving, ledge profile or test borings and any other physical or topographical features relevant to the installation and maintenance of the main or pump station. Where available, control shall be based on the Maine State Plane Coordinate System NAD 1983 West.

All drawings, specifications and Engineer's reports submitted for approval shall be prepared by, or under the supervision of, a registered Professional Engineer or others legally qualified to practice in the State of Maine. A cover letter shall be submitted with each set of plans and specifications giving a proposed description of work.

2. REVIEW:

The District's goal is to review plans within thirty (30) days after receipt. An Ability to Serve letter will be issued to the Applicant within this period. Comments will be returned to the Consultant. If the Applicant does not respond to the District's comments within sixty (60) days, the plans shall be considered inactive. In such cases, a new submission shall be required. All plans will be stamped upon receipt and reviewed in order of receipt.

3. APPROVAL:

Following review and approval, plans shall be stamped "Approved" and a letter of approval shall be issued to the developer or their agent. Approvals are valid for a period of eighteen (18) months from date of issue. If construction is not in progress at the end of that period, District approval is void. Plans and specifications may have to be submitted as a new project, if deemed necessary by the District, and must conform to the District's most current standards and specifications.

4. FINAL PLANS FOR CONSTRUCTION:

Prior to construction, the Applicant shall submit two paper sets depicting approved water and or sewer main/pump station configuration and an electronic version in AutoCad format of the final Planning Board signed plans. No construction shall begin or inspector assigned until these plans are received by the District.

B. PROJECT ACCEPTANCE

1. WATER

Upon completion the utilities must be dedicated to the District. A Certificate of Title and Project Acceptance form must be executed. Water mains shall not be activated until final inspection is complete. Upon final inspection and approval of the facilities and satisfaction of all District requirements, the District will accept the facilities in writing. The developer will be responsible for any repairs as a result of construction or defects for a period of one (1) year from date of acceptance. Any charges incurred during that year shall be paid by the Developer. A District inspector shall be present for all repair work.

2. WASTEWATER

Final acceptance will be in accordance with existing Contractual arrangements with the respective municipality. All systems must be installed in accordance with District standard details,

specifications, submitted design information and design specifications. 1 set of 24" x 36" as-built reproducible mylars and an electronic version in either .dxf of .dwg format shall be provided prior to acceptance.

C. EASEMENTS

Easements shall be required for all water mains, sewer lines and appurtenances except where installed within the public way of the State or the Municipality. Such easements shall not be less than forty (40) feet in width. Combined water and sewer easements shall be not less than forty (40) feet in width with both pipes ten (10) feet from the edges of the easement. The District reserves the right to require additional easement width if construction and maintenance activities require it. All easements shall include the right of ingress and egress as well as the right to install and maintain water and sewer lines. If necessary, easements shall extend to adjacent properties for orderly extensions of service.

All appurtenances (blow-offs, hydrants, etc.), if not within the pipeline easement limits, shall be provided with an easement ten (10) feet by ten (10) feet centered around the appurtenance.

No buildings or permanent structures shall be constructed within the easement, except if the easement includes a roadway. In a roadway easement, pavement and other utilities will be allowed. Any utility crossings shall be generally perpendicular and shall maintain a vertical separation of one (1) foot except as noted below in Section D.

No trees, shrubs, structures, fences or obstacles shall be placed within an easement that would render the easement inaccessible by equipment. Any person who constructs a structure within the utility easement shall be liable for the cost of removal and/or any damage to the utility.

D. SEPARATION OF WATER AND SEWER LINES

1. There shall be no physical connection between a drinking water supply line and a sewer or appurtenance.

2. Water lines shall be laid at least ten (10) feet horizontally from a sewer or sewer manhole whenever possible; the distance measured from edge to edge. When local conditions prevent a horizontal separation of ten (10) feet, the water line may be laid closer to a sewer or sewer manhole provided that:

   a) The bottom (invert) of the water main shall be eighteen (18) inches above the top of the sewer and the edge to edge distance shall be no less than five (5) feet.
   b) Where this vertical/horizontal separation cannot be obtained, the sewer shall be constructed of AWWA approved Ductile Iron water pipe, pressure tested without leakage prior to backfilling.

3. Water lines crossing sewers shall be laid to provide a separation of at least twelve (12) inches between the bottom of the water line and the top of the sewer, whenever possible. When local conditions prevent this vertical separation, the following construction shall be used:

   a) Sewers passing over or under water lines shall be constructed of AWWA approved Ductile Iron water pipe.

   b) Water lines passing under sewers shall, in addition, be protected by the following:

      i. A vertical separation of at least (12) inches between the bottom of the sewer and the top of the water line.
      ii. Adequate structural support for the sewers to prevent excessive deflection of the joints and the settling on and breaking of the water line.
      iii. One full length of waterline be centered at the point of the crossing so that the joints shall be equidistant and as far as possible from the sewer.

4. The following minimum separations from water mains shall be observed at all times unless otherwise directed by PWD personnel:

   Horizontal Separation
   a) Sanitary Sewers – refer to requirements in this section noted above
   b) Storm drains – 3' face to face for mains; 1' at contact points for CBs and DMHs
   c) Gas mains – 6' face to face
   d) Underground electric and telephone – 6' face to face
   e) Utility Poles – 6' face to face

   Vertical Separation
   a) Sanitary sewers – 12" over and under
   b) Storm drains – 6" over and under
   c) All other crossings – 12" minimum

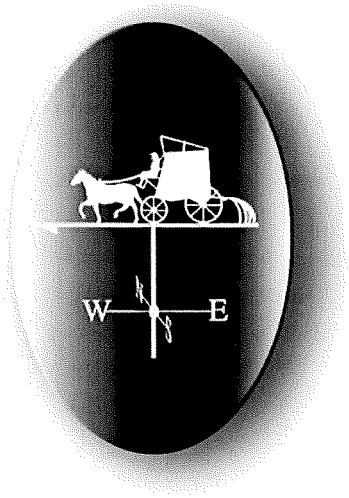
5. The following minimum separations from water services shall be observed at all times unless otherwise directed by PWD personnel:

   Horizontal Separation
   a) Storm drains – 3' face to face for mains; 2' at contact points for CBs and DMHs
   b) Gas mains – 6' face to face
   c) Underground electric and telephone – 6' face to face
   d) Property lines – 10'
   e) Sanitary sewer – 5'; if sanitary sewer service is laid 18" below water service, then an 18" horizontal separation is allowable
   f) Curb stops for multiple services – 18"
   g) Utility Poles – 6'

6. The following minimum separations from hydrants shall be observed at all times unless otherwise directed by PWD personnel:

   Horizontal Separation
   a) Gas mains – 3' face to face for hydrant branches
   b) Underground electric and telephone – 3' behind hydrant (not allowed over hydrant branch)

SECTION II: Work Associated with Water Main Construction



A. GENERAL

1. MAIN EXTENSION AGREEMENT:

After final plans depicting the approved water main configuration and right of way and or easements have been received, the District and the developer/contractor shall enter into a main extension agreement. At this time, the developer will deposit the following estimated fees:

a) Public Fire Protection Fee:
A fee applies in the amount of $4.00/ft for all towns except Raymond and Scarborough, $8.00/ft for these two towns. This fee applies when a main can be extended in the future beyond the end of a main extension in a local or state road. The amount is based on the average, per-foot cost of installing a public hydrant in each municipalilty. The footage is the distance from the last hydrant installed to the end of the main. This allows the prorated share of the cost of a future hydrant to be escrowed and applied to the installation cost when installed.

b) Planning & Engineering Fee:
This fee of $600/day represents non-inspection time spent by PWD's Asset Management and Planning Department to develop inspection plans, update record information, and complete As-Built record drawings. This estimate is based on the size and complexity of the project.

c) Inspection Fee:
$300/day (estimated at the beginning of the project and reconciled at the end of the project based on actual time that PWD spent inspecting the project)

d) Service Application Fee:
$45/service line

e) Meter Installation Fee:
$206.76 (typical residential meter) and up. Costs for larger size meters available on PWD website – www.pwd.org)

f) Main Extension Application Fee:
$154/project

g) Valve Box Adjustment Deposit:
$25/valve box (collected on main extensions). Deposit is refunded to Applicant when valve boxes are raised to final grade by Applicant's Contractor upon application of final paving surface. Should final paving not be completed after expiration of the one-year main warranty period, responsibility for raising valve boxes and deposit transfer to the Portland Water District.

h) M.D.O.T. Street Opening Permit Fees (if applicable).
State opening permit must be obtained by P.W.D.

After the project is completed, the District will reconcile all costs associated with the project and will either provide a refund if total costs are less than the deposited amount or request payment for costs in excess of the deposited amount.

2. LEGAL LOCATION PERMITS:

The Developer or agent shall submit a legal location permit (state or municipal) to the District. The District will sign the permit and submit to the State or Municipality.

3. INSPECTION:

An inspector from the District or a consultant working for the District will be assigned to each project to ensure that all work is completed and materials are installed in compliance with these specifications. All work must be inspected prior to backfilling. During the course of the work the inspector will report to the Engineering Supervisor on the progress of the work. Any deviation from the approved plans or specifications must be approved by the District before incorporation into the work.

The Contractor shall schedule with the District for inspection services a minimum of 5 working days prior to construction.

B. DESIGN CRITERIA

1. PIPE SIZE/TYPE:

All distribution mains 4" and larger shall be ductile iron per material specifications except under special site conditions where the District will specify a different pipe type. Beginning in 2007, all ductile iron pipe and services shall be wrapped in polyethylene encasement per AWWA Standards, PWD material specifications, and DIPRA's Polyethylene Encasement Installation recommendations. All distribution mains smaller than 4" shall be PVC per PWD material specifications.

All requests for a modification of the standard pipe material shall be made during the plan review phase of a project, not during the pre-construction phase, and shall be approved by the Business Development Engineer. The District will review leak history, available soil mapping, wetland delineations, plans showing cathodically protected utility crossings, and may require soil sampling prior to approving the change. Should it be shown that highly corrosive soils exist, PWD will specify the type of pipe to be used.

All main distribution pipe lines shall be of a size to adequately serve the needs of the proposed development and any potential extensions thereof, but in any event shall not be less than eight (8) inches in diameter except as may otherwise be permitted herein:

The minimum size of the pipe where public fire protection is to be provided or required shall be eight (8) inches in diameter. Dead-ends shall be minimized by looping all mains where practical. Where dead-ends are necessary they shall be terminated with a fire hydrant, or blow-off assembly. The nominal pipe diameter of water mains without public fire protection shall not be less than four (4) inches.

The District may request that the size of the main be increased beyond the required size for the project. This is sometimes necessary to facilitate the future expansion of the system beyond the scope of the developer's project. In this case the District will pay to the developer the difference in cost of the material between the two sizes.

2. DEPTH OF COVER:

Water pipe shall be laid with a cover of five and one-half (5 ½') feet measured from established finished grade to the top of the pipe in all towns except Standish, Windham and Raymond. In those towns water pipe shall be laid with a cover of six (6') feet measured from finished grade to the top of pipe. The contractor shall establish adequate elevation control to ensure that upon final grading appropriate cover over water lines has been maintained. It shall be the Contractor's responsibility and expense to verify the cover at any location questioned by the District. Any potential changes in alignment or grade of roadways shall be considered in the original utility design. Any deviation from the required cover shall be approved by the Engineering Supervisor.

3. GATE VALVE LOCATIONS:

Gate valves shall be installed at all pipe junctions and street intersections in such a manner as to control and cut off flows in all segments of the system. A minimum of two (2) valves are required at tees. A valve may be required beyond the last service if the main can be extended in the future. In all other areas gate valves will be required every 1000 feet, except as otherwise may be approved by the District. All new mains and services connecting to a main over 50 years old will require a valve at the main and an additional gate valve located at the property line. Additional gate valves may be required under certain situations, such as looped systems, where it is necessary to isolate certain sections of the system.

4. PRESSURE/FLOW REQUIREMENTS:

All distribution systems shall be capable of providing a minimum working pressure of 40 p.s.i. at each service connection under maximum day demand conditions, plus the required fire flow as determined by the Insurance Services Office (ISO) or the local fire department. The consultant will provide the estimated peak demand for the project and the District will determine whether the project meets the pressure/flow requirements.

In the event that the 40 p.s.i. minimum pressure cannot be met, the developer/owner can request limited service for each service connection in question. The District will determine whether adequate conditions exist to grant limited service.

C. WATER LINE CONSTRUCTION

1. DUTIES OF THE CONTRACTOR:

Install the water mains so as to supply the District, upon completion, with a satisfactory, watertight pipeline, laid to proper line and grade, and in accordance with these specifications and approved plans to the satisfaction of the District, and will leave the site in condition which is suitable, not only to the District, but to those abutting the right-of-way, right-of-way grantors, and any municipal or state authorities having jurisdiction over the areas involved.

Obtain all street opening permits from cities or towns covering any pipelines to be laid in the public way and shall be responsible for fees levied by any regulatory agencies which are applicable to the work covered by this specification.

Establish line and grade for the pipeline and right-of-way boundaries where the pipeline is to be laid in right-of-way outside of a public way.

Familiarize himself with all obstructions which he can foresee, such as existing pipes, services, conduits, ducts, sewers or any other such obstructions which might interfere with the construction, and he agrees to make arrangements with the owners of such facilities so as to save the District harmless from any damages thereto caused by his operations and to make whatever arrangements might be necessary to move or remove and replace these facilities so as to permit the construction of this pipeline, all at his own expense.

Purchase all pipe, fittings, valves, gaskets and piping accessories, including but not limited to services, air valves and hydrants, in accordance with District specifications.

Make any changes which may be required, such as the removing or restoring of the property of others in the land through which this line will cross in right-of-way or otherwise. The Contractor will place all pipe, fittings, valves and all the attendant facilities in place in the proper trench, to proper

line and to proper grade, as called for in the plans and specifications and to the satisfaction of the District's representative.

Make all connections to the District system in accordance with standard District practice and under District inspection. The Contractor must disinfect all tools or equipment coming in contact with the water in a 5% hypochlorite solution.

Provide trench and excavation for the purpose of testing, chlorinating, and connecting the new main into existing pipe and promptly backfill such trench and patch and restore the surface as necessary. Provide and maintain trench barricades, warning signs, warning lights, traffic control, as required by applicable safety regulations and organizations with jurisdiction over traffic control.

Shall perform leakage tests and disinfect the completed main.

Upon completion of the work to the District's satisfaction, transfer to the District, free and clear of liens, damage claims or law suits all right, title and interest to all piping and appurtenances.

The following specifications for the performance of the work are part applicable, but do not necessarily constitute the full and complete specifications for the work. Such reasonable additional requirements as the Engineer may specify must be followed.

No valve, hydrant or other facility of the Portland Water District shall be operated by the Contractor or his agents. The District will, upon reasonable request of the Contractor, furnish men and equipment for such activity.

Provide a minimum of 4 days notice to the District prior to any required shutdown.

2. *INSTALLATION OF TEMPORARY WATER SYSTEMS:*

In order to maintain uninterrupted water service to District customers, the Contractor shall provide temporary above ground water systems. The temporary water systems consist of mains, services and fire department outlets. The above ground systems shall be installed only for the duration of deep water main replacement and removed promptly after main replacement is complete. Connections to an existing water source shall be installed and provided by the District. All material for the temporary water systems, except as otherwise indicated, shall be supplied by the contractor. Currently the District has approved 2 manufacturers for the temporary mains and 100-psi poly tube for individual services. Only authorized District personnel shall operate control valves attached to these systems.

Temporary Water Systems Approved Pipe

Certainteed Certa-Lok Yellowmine	Restrained Joint PVC pressure pipe and fittings
AquaMine (Victaulic Co)	Restrained Joint PVC pressure pipe and fittings

Temporary above ground water mains shall be installed in a manner to both protect the public water supply and to minimize customer service interruption. To allow the District to notify its affected customers, the Contractor shall provide the District a minimum of 5 working days notice prior to installing any temporary lines.

The size and approximate location of the temporary systems are shown on the drawings. The Contractor must obtain the approval of the District for any changes prior to installation of the system.

Temporary mains shall typically be installed behind sidewalks or along the edge, and within the public right of way. The mains shall follow a uniform straight course and shall not bow to accommodate long sections of pipe. Temporary mains shall not be installed on private property. The route of services lines installed from the mains to houses shall be acceptable to the property owner.

The Contractor shall follow the pipe manufactures installation guidelines when installing temporary systems. Additionally, an approved joint lubrication for the installation of potable water pipe shall be used on all joints prior to connecting pipe.

Source: The District will provide necessary connections at fire hydrants including an approved backflow device and meter. A chlorine tap will also be provided.

Disinfections: All 2" diameter and larger temporary mains shall be chlorinated, sampled, and tested for bacteria prior to activating any portion of the temporary mains. (See disinfection specification for deep mains).

Leakage test: All systems shall be watertight. A static pressure test shall be performed on all systems prior to disinfecting any portion of the system.

Test Procedure

1. Install a pressure gauge at furthest end of the system.
2. Open main feed valve to fully charge the system with water and bleed all air.
3. Record the static pressure reading.
4. Close main feed valve.
5. The system must hold static pressure for a minimum of 30 minutes.

Driveway crossings: A gravel or cold patch raised berm shall be placed over temporary mains to prevent vehicles from dragging along the ridge.

Sidewalk crossings: A gravel or cold patch raised berm shall be placed over temporary mains to eliminate tripping hazards. In areas where the berm would prevent rainwater drainage plywood ramps shall be installed the full width of the sidewalk and over the temporary mains

Roadway crossings: Temporary mains shall be buried just below the surface of the roadway. The pipe shall be protected with clean sand or material free from rocks, as the rocks tend to punch through the pipe when exposed to heavy traffic. The use of cold patch or QPR as fill material is acceptable.

Curbing or esplanade rise: To accommodate curb rise, pre-fabricated certa-lock bends and/or elbows shall be used. Sweeping or bending the actual pipe is not an acceptable method unless the sweep lies flat on the ground and is not obstructing walkways. A traffic barrel shall be placed near the curb at offset connections to protect the offsets from being damaged by vehicles.

Cutting pipe: Follow manufacturer's installation instructions. All joints, including those on cut lengths of pipe, shall be grooved to provide a restrained joint. Pre-fabricated bends, elbows, and tees shall be used when changing direction.

Blow off: A 1" blow off shall be installed at the ends of all temporary mains. The blow off shall be constructed using a 1" brass female curb stop.

Isolation valves: Shall be 2" brass female curb stops for 2" mains and 4" resilient wedge valves for 4" mains (grip rings shall be used for 4" valves). Valves shall be located as shown on the plan. The valves are attached to the mains using pre-fabricated adapters.

Service line connections: All temporary individual service lines shall be ¾" poly tube rated at a minimum working pressure of 100 psi. The service lines shall be connected to a 2"x 3/4" factory tapped restrained joint coupling, then a ¾" close brass nipple, a ¾" female curb stop and a brass poly tube adapter ¾" insert x male. The tube shall be extended to a sill cock (outside faucet) and connected using the same poly tube adapter. Prior to connecting the service, a garden hose connection, including a brass boiler drain or sill cock valve shall be installed in the line. All service lines shall be flushed prior to activating mains. *See Detail sheets (1,2,3)*

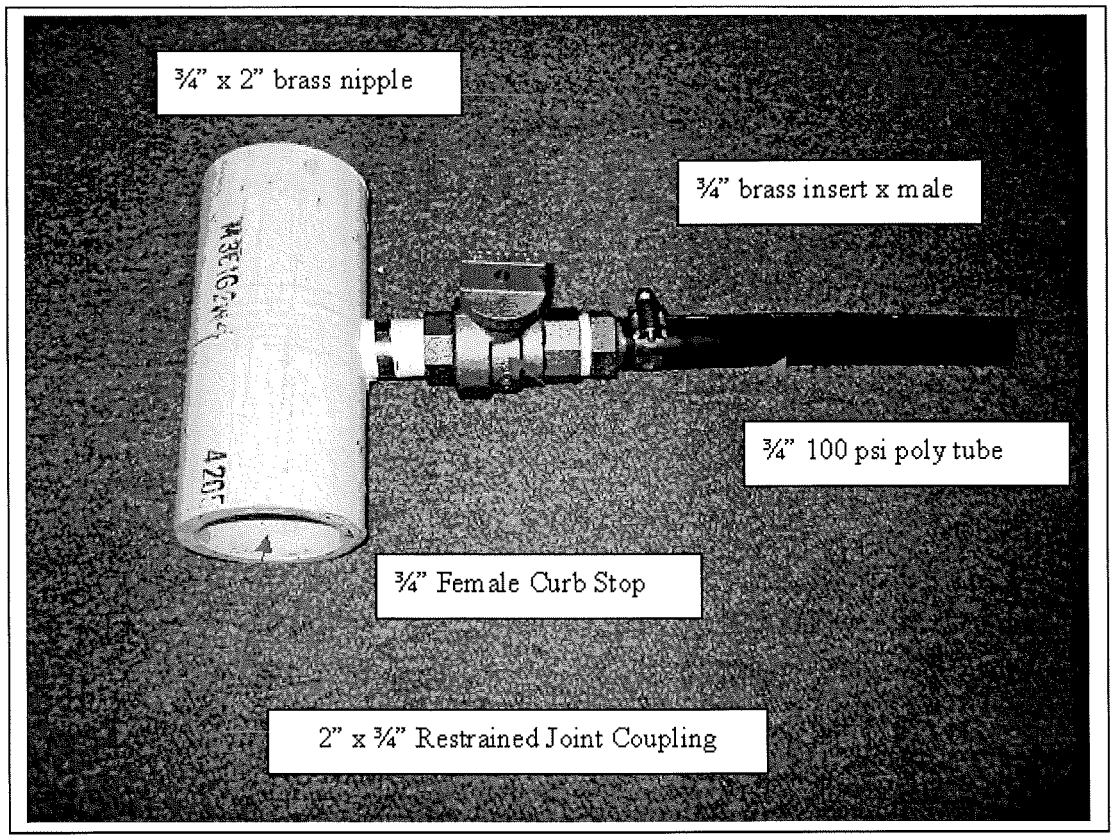
Anti-siphon sill cocks: Only District authorized personnel shall disassemble anti-siphon sill cocks. Excavating and connecting into existing deep service lines may be required where properties have malfunctioning sill cocks or no exterior plumbing.

Shutting off meters: After activating the temporary lines, all meters shall be shut off. Only District authorized personnel may de-activate meters.

Maintenance of temporary water systems: The contractor shall be responsible for maintaining the temporary systems during the regular workday including making repairs to the systems. The District's Inspector must be on site prior to any work, or repairs being performed on the temporary water systems. District crews will respond to all after hour's emergencies. All affected customers shall be notified as soon as possible prior to any service interruption.
It is expected that contractors will keep an inventory of readily available repair parts on hand enabling them to quickly respond to any type of problem. Restrained joints shall be maintained. The use of non-restrained joint couplings is prohibited. Joint leaks shall be cut out. The use of stainless steel wrap around repair clamps over pinholes is acceptable.

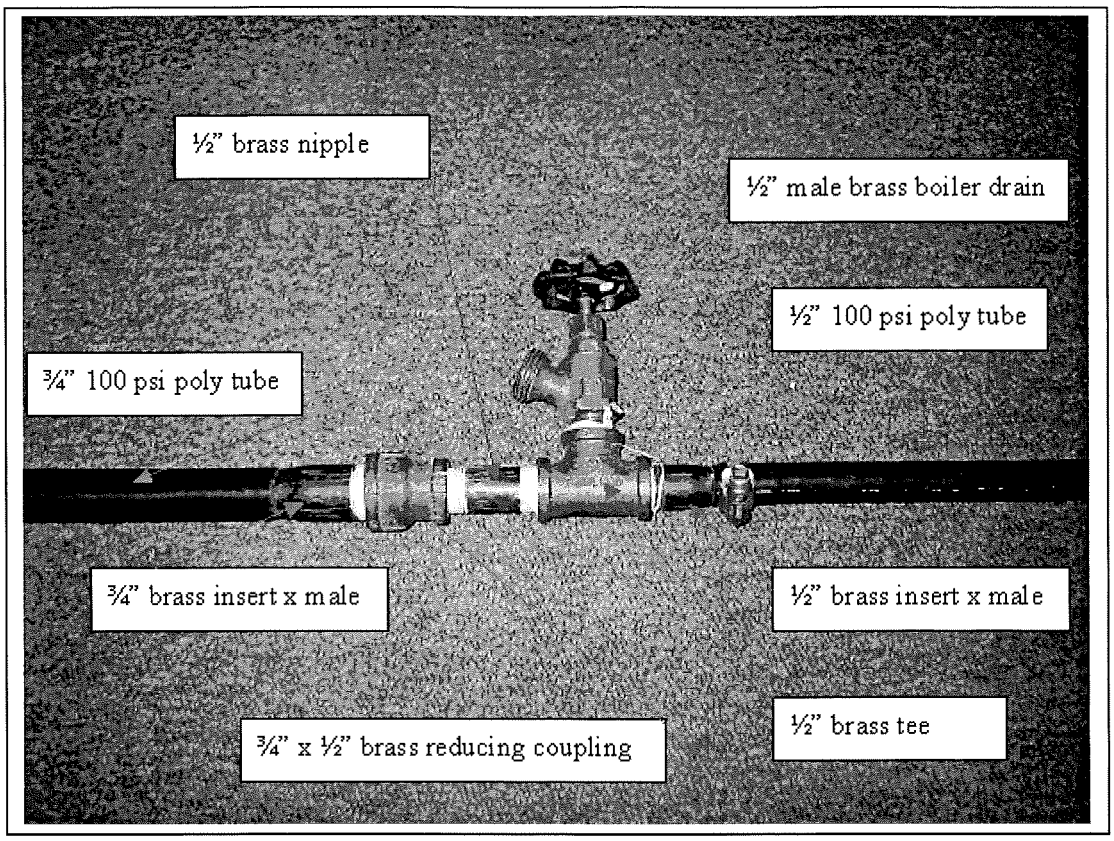
2" x ¾" Factory Tapped Restrained Joint Coupling and associated fittings.

(Section 1)



Temporary service line boiler drain assembly used for customer garden hose connection.

(Section 2)

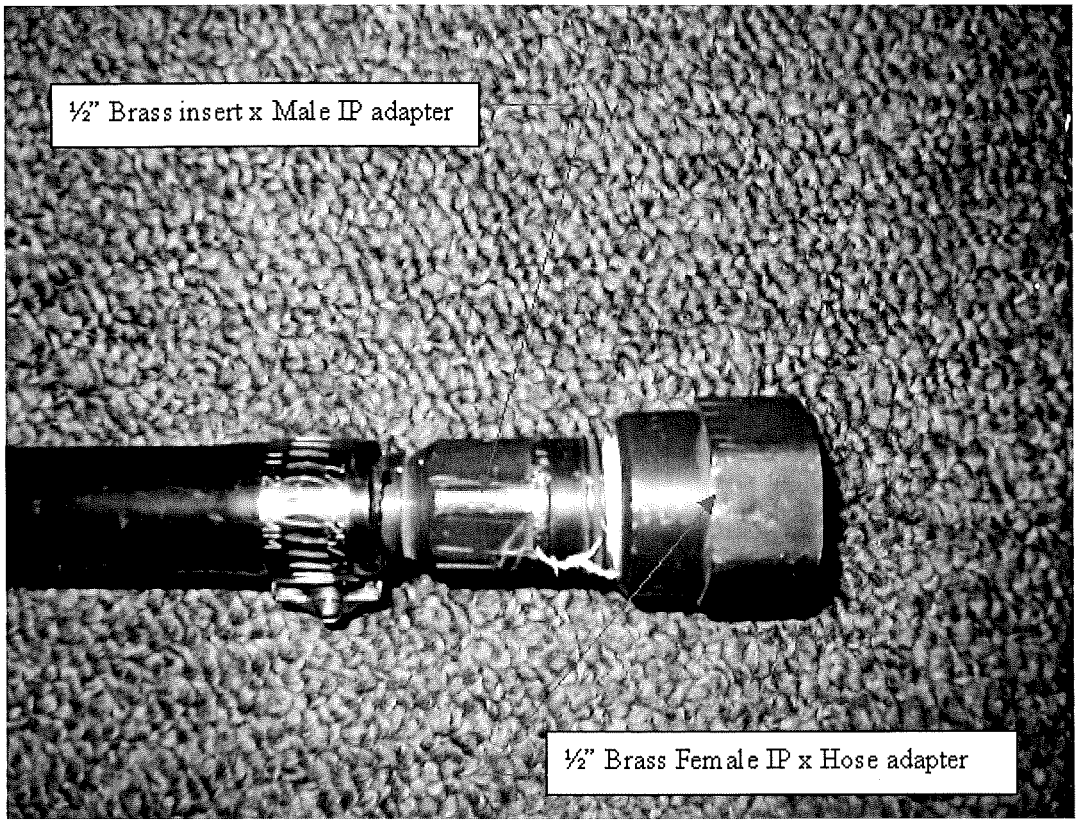


Temporary water Service – Final Connection to customer sill cock

The final house connection shall be a non-swivel, rigid connection as shown.

(Section 3)

revised 7-10-03



3. EXCAVATION:

The Contractor will make application for all necessary street or highway opening permits necessary for the pursuit of the work. No street or highway opening shall be made by the Contractor until the appropriate permit has been received and is in hand, and when such opening shall be made, it shall be done in strict accordance with the terms of the permit.

When any pavement, regardless of type, must be cut, it shall be done in a neat and symmetrical manner by use of a saw, chisel, or other suitable method. In no case shall pavement be torn up with a backhoe bucket except between and inside of cuts previously made as above. Should any further pavement be broken, outside of the cuts, as by blasting, such damaged pavement shall be cut out in a neat and orderly fashion.

The trench shall be dug so that the pipe can be laid to the alignment and depth required and shall be excavated in advance only to the extent necessary for the proper pursuit of the work; the amount excavated ahead may be controlled by the District representative. The trench shall be kept dewatered, such that no drainage water shall enter the pipe, and the end of the pipe shall be temporarily plugged off at night or over weekends, or whenever the work is suspended, or in cases where unstable material could cause a cave-in to enter into the exposed end of the pipe. The trench width shall be the minimum necessary to properly lay and joint the pipe, permitting whatever bracing or sheathing may be necessary in unstable material. The bottom of the trench shall be smooth and even and should be as nearly undisturbed as possible so that the barrel of the pipe may be laid in a flat bottom trench on good solid material. Shallow holes should be dug at the joints so that the barrel of the pipe shall be in contact as much as possible with the solid floor of the trench. In ledge installation or in boulders or other large stones, there shall be at least 6" clearance between the barrel of the pipe and any ledge. These clearances are the minimum to be permitted between any part of the pipe or appurtenance being laid and any part or projection or point of a rock, boulder or stone. The bottom of the trench may for a short distance, near the center of the pipe length, be left slightly low to permit the withdrawal of the slings with which the pipe is placed in the trench. This material shall be replaced and compacted mechanically when the pipe is in place. Likewise, if for any reason the bottom of the trench should be excavated below the desired grade, suitable material may be replaced to bring the bottom of the trench up to the proper grade before pipe is put in place. This material is to be mechanically compacted so as to give it a smooth, solid base for the pipe, subject to the approval of the District representative. When the bottom of the trench at subgrade is found to be unstable or to include cinders or other types of refuse, or vegetable or other organic material, or large pieces or fragments of inorganic material or stone or rock, any such undesirable material shall be removed and replaced with suitable material before the pipe is placed. Such material as is used to replace unsuitable material in a trench bottom shall be compacted in layers of no more than 8" by mechanical means before the pipe is placed on it. In the case of unstable material, the District inspector may, at his discretion, order crushed stone or gravel to be used to stabilize the pipe bed before pipe is placed in the trench.

All structural excavations and trenches shall be sheeted or braced as required for the safe pursuit of the work, the protection of structures, the protection of other utilities, and as required by any Federal, state or municipal laws, ordinances or regulations.

The Contractor shall be responsible for the design, adequacy and maintenance of all sheeting, sheet piling, bracing or other temporary structures or supports required.

When the sheeting or shoring cannot be removed without endangering the new work, other structures or the security of the banks, it shall be left in place.

4. PIPE LAYING:

4.1 Handling of Materials into Trench

Proper implements, tools and facilities shall be provided and used by the Contractor for the safe and convenient handling of all materials. Pipe fittings and accessories shall be carefully lowered into the

trench, piece by piece, by means of derrick, crane, slings and other suitable tools and equipment, in a manner such as to prevent damage to the material or to its protective coating and linings. No chain or slings shall be passed through the inside bore of any pipe or valve or fitting. Under no circumstances shall piping materials be dropped or dumped into the trench.

4.2 Cleaning of Materials

All lumps, blisters, excess coating material or other foreign matter shall be removed or cleaned from the pipe, with particular attention being given to the spigot end, which enters into the bell of the next adjacent pipe. Also, the inside of the bell shall be cleaned and wiped dry and clean before any joint material is applied to it. All foreign matter shall be removed from the inside of pipe, fittings, valves, and the interior cleaned and kept clean. Particular attention shall be given to the cleaning of surfaces to which gaskets are to be applied, and especially to the inside grooving of the push-on pipe bells.

4.3 Laying Pipe

Every possible precaution shall be taken to prevent foreign material from entering into the pipe as it is being placed in the trench. Likewise, no foreign matter shall be allowed to enter into the joint area between pipes. If there is any question as to foreign material having gotten into the joint, the joint shall be taken apart and checked and made up again in the proper manner. The inside of every pipe, as it is lowered into the trench, shall be checked for any dirt or stone or other debris, or any material whatsoever which may be inside the pipe, and such extraneous material shall be cleared out and the pipe made completely clean before it is jointed into the next pipe in the trench. Precautions shall be taken such that no backfill material shall enter the open end of the pipe already laid in the trench, and every effort shall be made to prevent trench water from entering the pipe. Whenever pipe laying is not in progress, a watertight plug or other effective means shall be used for keeping any extraneous material from entering into the pipe. Any water in the trench shall be kept down by pumps, such that it will be below the invert of the pipe already laid. Sump holes may be dug in the bottom of the trench, off center of the pipe, for the purpose of keeping the pump suction below the gradient of the bottom of the pipe. No pipe shall be laid in water or when, in the opinion of the PWD representative, conditions are not suitable for laying.

4.4 Cutting Pipe

Any pipe which must necessarily be cut on the job in order to put fittings, valves or other accessories in the proper place shall be done in a workmanlike manner satisfactory to the District. In case of "push-on" joint pipe, proper chamfering must be done on the ends of any cut pipe before an attempt is made to enter it into a bell. In the case of mechanical joints, a smooth, square, neat cut must be made. On Ductile iron pipe a saw or abrasive wheel type of equipment shall be used. On cast iron pipe smaller than 12", wheel cutters or other approved method may be used, but in no case shall any cement lining of iron pipe be harmed in the cutting. No so-called "cold cutters" will be allowed on the job. All cuts shall be square and even, with no ragged, rough ends. Any unevenness shall be ground smooth. Pipe shall be cut no closer than 2' from the bell.

4.5 Bell Ends to Face Direction of Laying

The pipe shall be laid with the bell ends facing the direction of the laying, unless otherwise permitted by the District.

4.6 Blocking

Permanent blocking necessary to support the pipe in the trench shall be done only with specific authorization and approval of the District. Temporary blocking under valves and fittings for support prior to the building of permanent supports or anchors is allowed.

4.7 Jointing Of Pipe

All joint areas on the pipe shall be cleaned and free from irregularities before an attempt is made to make up any joints. Joints, when made, shall be done in the manner prescribed by the manufacturer of the pipe.

In the case of rubber gasket joints, these joints shall be made up in accordance with the American Standard specifications for the jointing of cast iron pressure pipe and fittings including torque. ASA #A21.11 (AWWA #C111).

Consult the Portland Water District for guidance in the proper selection of pipe gaskets in areas of contaminated soils. The Portland Water District reserves the right to specify the use of specialty gaskets, including nitrile and viton gaskets.

In the case of flanged joints, flange faces shall be thoroughly cleaned before making up such joints, so that no paint globs or any other projections or rust or other foreign matter remain on the faces of the flanges and that they are smooth, clean iron. Bolts and nuts shall be tightened evenly, being tightened in pairs on opposite sides of the pipe, until all are equally torqued. When completely tightened, the bolts should be long enough so that all nuts are "full".

Solid long body sleeves per specifications shall be used when connecting new pipe of all sizes. When joining a new section of pipe to an existing section of unknown O.D., a "duo" sleeve shall be used for sizes up to and including 16". The "duo" sleeve will accommodate the increased O.D. of older cast iron pipe. For connecting to a section of pipe with an unknown O.D. above 16", an approved steel coupling may be used. The existing pipe O.D. shall be measured prior to ordering the coupling.

4.8 Permissible Deflection of Joints

Whenever it may be necessary to deflect pipe from a straight line, either vertically, horizontally, or other direction to change the direction of laying, in all sizes 12" and smaller, the allowable deflection shall be 3 degrees per joint, or 16 inches per 20' length; in larger sizes, 1 1/2 degrees, or 6 inches per 20' length. Every possible precaution shall be taken to be sure that each joint is properly made up and that the pipe is "home".

4.9 Setting Valves & Fittings

All valves, fittings, plugs and/or caps shall be set and jointed into the pipe, and blocked and anchored as shown on the plans. The location of these features along the line shall be in accordance with the general plans for the pipeline. Any unconnected outlets shall be valved and securely plugged with adequate and appropriate pipe plugs or blind flanges, as called for on the plans (See Sec 4.14). 'Mechanical Joint' bends, plugs, sleeves and caps shall be restrained with a PWD approved restrainer.

4.10 Valve Boxes (See Standard Detail and Materials Section)

All valves 12" and smaller shall be fitted with a standard valve box set so as to not come in contact with the valve body and concentric with the operating nut, straight, square and plumb. The top shall be set to the proper surface grade and, after backfilling and settlement have taken place, these valve box top sections shall be straightened, reset or adjusted as necessary. All valves shall be supplied with proper boxes and/or chambers, as called for in the plans and these specifications. At least two permanent location measurements to the valve must be obtained. Backfill around valve boxes shall be mechanically tamped within a five-foot radius of the valve box. Backfill at valve chambers shall be mechanically tamped for a distance of 30 feet along the trench, both upstream and downstream from the ends of the chamber.

4.11 Hydrants

Hydrants shall be installed in accordance with the District's standard details. The hydrant tee and the hydrant base shall be appropriately braced. Trenching for hydrant and branch shall be done in accordance with Section 3 herein. All appurtenant piping and jointing shall be done in accordance with Section 4 herein.

4.12 Services

Services shall be tapped on the side of the main in accordance with the District's standard details. Service piping shall be copper with a minimum size of 1" and conform to the Maine State Plumbing Code for buried cold water service lines. Enough slack shall be placed in the material to prevent stretching or pulling from main. A service shut off (curb stop) with rod shall be placed in a service box

6" from the right of way line in the public way. Any service box located in a paved area except sidewalks shall be installed inside a full sized gate box top section. At least two permanent location measurements to the service shut off must be obtained. Services shall have 5-1/2 feet of cover along the entire length of the service. For new main extensions, the service shall be installed at the center of the lot to be served. The only exception will be when a foundation is already on the lot. In that case, the service can be installed anywhere along the foundation frontage to the road. For new services installed on existing mains, the service shall be installed a minimum of 10 feet from the property line. Trenching and backfilling shall be done in accordance with Sections 3 and 5 herein.

Standard small service sizes include 1", 1-1/2" and 2" diameters. 1-1/2" and 2" services shall consist of a corporation threaded into an approved tapping saddle. One inch and three quarter inch corporations (where allowed) shall be threaded into the main.

Domestic and fire services to the same building shall consist of completely separate lines beginning at the main. Combined services (fire services greater than 2" that have a domestic service tapped at the street line) shall require approval during the plan review process of a project. If approved, combined services shall have individual shut-off valves for both the fire and domestic service at the street line. Additional gate valves may be necessary under certain situations.

All domestic services 2" and larger and all combined services shall require chlorination/dechlorination. Any service with a joint between the main and the end of service for live taps shall require a restrained joint gasket at each joint; methods for pressure relief on private property are recommended in these instances.

4.13 Protective Wrapping
As required, special plastic sleeves or envelopes shall be slipped over the pipe and sealed together with plastic adhesive tape. Care shall be exercised such that these sleeves shall be intact and sealed together when backfill is placed, and during the backfill operation, likewise, care shall be taken not to puncture the material.

4.14 Pipe Endings
ALL dead-end sections of pipe shall end with a hydrant where possible; otherwise a blow off valve. This shall include all main stubs into subdivisions in addition to the main runs. Fire services 4" and larger that require pressure testing shall also end with a blowoff valve, however a 2" ball valve may be substituted for the 2" gate valve for service stubs.

4.15 Abandoning Pipe & Services
All abandoned water mains shall be terminated with a mechanical joint cap or push-on plug. No brick and mortar will be allowed. Abandon service pipe by shutting corporation and cutting pipe close to the corporation. The associated curb stop, box and rod shall be removed. For water service lines larger than 2", and all hydrants, mains and valves, the connection at the main shall be excavated and removed and a solid piece of pipe sleeved into its place.

5. BACKFILLING:

5.1 Material
All backfill material shall be free from cinders, ashes, refuse, organic matter, boulders, rocks, stones or other material which, in the opinion of the District, is unsuitable for the purpose. However, from one foot above the top of the pipe to the top of the trench, material containing stones up to 8" in their greatest dimension may be used unless otherwise directed by the District. When the type of backfill material is not otherwise specified on the drawings, the material excavated from the trench may be used as backfill upon its approval by the District, provided that unsuitable stone, etc., as above, are sorted out. Where any specific type of backfill material is indicated on the plans, such notation shall be followed and native material will be hauled away and disposed of to make way for the specified material. Pipe in ledge trench is to be backfilled with select material.

5.2 Backfill In Right-Of-Way (Untraveled)
From a point one foot above the pipe to the surface, backfill material may be placed by machine, but shall be worked over in such a manner as to minimize future settlement of this material. The backfill material shall be mounded up to an excess depth of 3" to 6" over the trench to allow for future settlement, and before the Contractor finishes and the job is accepted, this situation shall be reviewed and any necessary fill added so that there is no depression left due to settlement of the trench at any point. The above is the minimum requirement, and when highway or street requirements are more stringent, such requirements shall be met.

5.3 Backfill within Public Streets, Highways and Traveled Areas
Backfilling in public right-of-way, along the streets or highways in or along shoulder, berm or backslope shall be done in accordance with the specifications and requirements of the state or municipality, whichever is responsible for the street or highway involved. Responsibility for the fulfillment of permit conditions or any other applicable requirements of the street or highway authority shall be the obligation of the Contractor. Surface restoration shall be carried out to the satisfaction of the street or highway authority or as shown on the plans. The trench shall be topped out with gravel a depth meeting municipal or state specifications.

Where the trench crosses or follows highways, streets or other areas such as driveways, parking areas, etc., or wherever there will be vehicular traffic with or without a pavement over the trench the backfill from a point one foot above the pipe shall be placed in 8" layers if compacted by manual plate equipment or 24" lifts with approved roller type equipment. Compaction of granular material shall be by means of a mechanical vibratory compactor. Other material shall be compacted by pneumatic or other mechanical compaction methods. In all cases a gravel or stone base shall be placed to a depth at least equal to the existing road base, but in no case less than one foot of depth.

5.4 Backfill in Ledge Trenches
Backfill around the pipe in ledge trench shall be either sand or fine gravel (6" below and 12" above the pipe), but in cases where corrosive conditions may prevail due to the type of ledge or other material which has been excavated, clay may be specified on the plans or by the Engineer. In cases where granular material is used, a complete clay dam shall be put in the backfill at least every 100' along the trench where the surface gradient is other than horizontal.

5.5 Backfilling – Structures
The excavation for thrust blocks and other structures shall be refilled with such of the excavated materials and in such order as may from time to time be directed by the District. Whenever the excavated materials are unsuitable, the Contractor shall furnish suitable backfill materials. This material shall be a uniformly graded bankrun gravel having no stones larger than 6 inches.

The backfill around structures must be carefully placed in layers not to exceed 8" and tamped and brought up evenly around all sides of the structure. The material shall be thoroughly tamped with mechanical or vibratory compactors and water added, if necessary, to obtain 90 percent laboratory density as determined by the Standard Method of Test for Compaction and Density of Soils AASHO Designation T-99.

Backfilling around pipes outside the structures shall be in accordance with the pipe laying specifications.

5.6 Operation in Freezing Weather
In freezing weather, no backfill material which is frozen shall be placed in the trench, but if backfilling must be done, new unfrozen material must be brought to the site and the frozen material disposed of elsewhere.

Should the excavation take place in sustained periods of freezing weather, the sides and bottom of the trench shall be protected to prevent freezing of the material to the satisfaction of the District.

5.7 Open Trench
Backfilling shall follow pipe laying as closely as reasonable, so that a minimum of trench shall be open at any time. The regulations of the highway authorities shall be observed as regards the amount of trench to be open at any one time. Over night, and especially over weekends and holidays, the amount of open trench shall be kept at an absolute minimum. Any caved-in trench, especially after heavy rain and flooding, shall be cleaned out and the bottom consolidated before any additional pipe shall be laid.

6. FILLING AND TESTING:

6.1 Upon completion of backfilling, the Contractor shall fill the pipeline with water from the Portland Water District's system and conduct a pressure and leakage test in accordance with Section 4 of AWWA Standard C600-82 and the following procedures.

6.2 The Contractor shall not operate any existing District valves for filling, flushing or testing the new main. The District will provide the necessary personnel upon request.

6.3 Under the inspection of the District, the Contractor shall slowly fill the new main and ensure that all air has been expelled from the main, hydrants, air valves and service leads. Once all air is expelled, the Contractor shall flush the new main at a minimum velocity of 2.5 feet per second turning the over the volume of water in the main a minimum of 3 times. The "scour" flow rate shall be calculated by the District and verified in the field. The Contractor shall be responsible for all dechlorination and disposal of all flushing water and providing any necessary hoses or equipment for flushing and prevent unnecessary erosion.

6.4 The Contractor shall excavate and provide a tap for pressure and leak testing and chlorination. The chlorine tap shall be installed within ten feet of the source if practical. Otherwise, install the tap immediately outside of existing pavement. The Contractor is responsible for all work associated with the excavation, including proper trench protection, barricades, traffic control and proper backfilling and compaction upon successful completion of the test. Upon completion of the test all fittings and pipe shall be removed and all corporations shut.

6.5 The Contractor shall conduct the pressure and leak test and provide the required testing equipment after the new main has been properly filled and flushed, unless otherwise arranged with the District. The Portland Water District reserves the right to determine the geographic limits of pressure testing water mains.

The pressure and leak test shall be conducted as follows:

a) Purge all air from the line.

b) Decrease pressure in the main to be tested approximately 20 p.s.i. Observe test gauge to ensure the pressure doesn't rise due an existing valve or tapping valve leaking by. This is done to ensure that no undisinfected water from the installed main enters the existing main while performing the actual test.

a) A pressure test pump will be connected to the new main at the testing point. The pressure will be slowly increased to 150 psi and allowed to stabilize (+/- 2.5 psi) for a minimum of 15 minutes.

b) A reservoir of potable water shall be connected to the test pump and the initial level of water recorded.

c) The pump pressure shall be maintained at 150 psi for one hour with all makeup water withdrawn from the reservoir.

d) After one hour, the water level in the reservoir will be measured and the volume of water drawn from the reservoir calculated and compared with the following allowable leakage:

$$\text{Allowable leakage (gal/hr)} = \frac{\text{Pipe length (feet)} \times \text{Nominal diameter (inches)}}{10{,}900}$$

e) If any test discloses leakage greater than that specified above, the Contractor shall, at his own expense, locate and make repairs as necessary until the leakage is within the specified allowance. No repair clamps of any kind will be allowed. Repair shall consist of removing leaking section and replacing with couplings and pipe.

7. DISINFECTION:

Products:

Acceptable Disinfectants:

Sodium hypochlorite (NaOCl):

- Shall conform to the provisions of AWWA B300 'Standard for Hypochlorites' and
- Shall be certified to meet NSF/ANSI Standard 60 - *latest revision*, Drinking Water Treatment Chemicals – Health Effects.

Acceptable Dechlorination (neutralizing) Agents:

As defined in AWWA C651 'Standard for Disinfecting Water Mains', Appendix C

7.1 Scope

This specification becomes a standard part of the contract documents and covers the disinfecting and flushing of water mains within the Portland Water District distribution system. Unless specified otherwise, all procedures apply to new mains, cleaned mains, cleaned and relined mains, repaired mains, and mains which have been out of service for a long period of time.

In certain circumstances, the Director of Water Services or designee may waive or alter the requirements in this specification where it is determined that no reasonable threat of contamination constituting a health hazard or aesthetic deterioration exists in the water main in question.

7.2 Keeping the Pipe Clean and Dry

Precautions shall be taken by the Contractor to protect the interiors of pipes, fittings, and valves against contamination:

- Pipe delivered for construction shall be strung and protected so as to prevent entrance of any foreign material.
- Pipe shall not be laid in water, or when trench conditions or weather conditions are unsuitable for such work.
- All openings in the pipeline shall be closed with watertight plugs when pipe laying is stopped at the close of the day's work or for other reasons.
- Joints of all pipe in the trench shall be completed before work is stopped.
- The surface of the joint rings shall be thoroughly cleaned with an approved soap solution and all foreign matter removed from the pipe and fittings before the pipe is lowered in the trench.
- If dirt enters the pipe, it shall be removed and the interior of all affected pipe and fittings shall be swabbed with a 5% Hypochlorite solution or other commercially available household bleach immediately before they are installed.
- Pipes and services in the ground shall be closed off when not under construction.

7.3 Pre-Flushing

The District shall flush the source water, as near the shut off as possible prior to tying-in to ensure that contaminants or debris are not introduced into the new pipe.

7.4 Flushing

The main shall be flushed through a hydrant at the end of the main at a velocity not less than 2.5 ft./sec. If no hydrant is installed at the end of the main, the Contractor shall provide a tap large enough to develop a velocity in the main of at least 2.5 ft./sec. The gallons per minute to achieve 2.5 ft./sec velocities for different diameter pipes are provided in Table 1.

Table 1 Gallons per minute required to obtain 2.5 feet per second flushing velocity

Main Size (in.)	Gallons per minute
6	200
8	400
12	900
16	16000

District water at no cost to the Contractor will be available to the work site for use in disinfecting and flushing mains. The Contractor shall furnish all necessary pipe and hose connections. The Contractor shall exercise care in the use of the water to prevent contamination of the existing water supply. Measures shall be taken prior to flushing to provide adequate drainage during flushing. Drainage shall be away from the main, and flooding of the trench shall be prevented. The volume of water flushed shall be measured or calculated and reported to the District Inspector.

Wherever the conditions allow, the new water main shall be kept isolated from the active distribution system using a physical separation until satisfactory bacteriological testing has been completed and the disinfectant water flushed out. Water required to fill the new main for hydrostatic pressure testing, disinfection, and flushing shall be supplied through a temporary connection between the distribution system and the new main. The temporary connection shall include a double check valve assembly backflow preventer and shall be disconnected (physically separated) from the new main during the hydrostatic pressure test. It will be necessary to reestablish the temporary connection after completion of the hydrostatic pressure test to flush out the disinfectant water prior to final connection of the new main to the distribution system.

7.5 Methods of Disinfection

The Contractor shall disinfect all portions of the water main that was worked on as well as any portion(s) of the network that was taken out-of-service to allow completion of the contract. The chlorine solution to be used must be Sodium Hypochlorite.

NOTE – The use of Calcium Hypochlorite granules left in the main to be dissolved on filling of the main is not an approved method.

7.5.1 Continuous Feed Method

The continuous feed method consists of completely filling the main to remove all air pockets, flushing the completed main to remove particulates, and filling the main with chlorinated potable water so that after a 24±4-hour holding period in the main there will be a free chlorine residual of not less than 10 mg/L at all locations of the main.

Prior to being chlorinated, the main shall be filled to eliminate air pockets and shall be flushed to remove particulates. The flushing velocity in the main shall be not less than 2.5 ft/sec unless the Director of Water Services or designee determines that conditions do not permit the required flow to be discharged to waste.

NOTE – Flushing is no substitute for preventive measures during construction.

At a point not more than 10 ft. downstream from the beginning of a new main, water entering the new main shall receive a dose of chlorine pumped at a constant rate such that the water at any location will have not less than 25 mg/L of chlorine. To assure that this concentration is provided, the District representative shall measure the chlorine concentration at regular intervals at available blow-offs or hydrants in accordance with procedures described in the

current editions of "Standard Methods for the Examination of Water and Wastewater" or using an appropriate chlorine test kit.

Table 2 gives the amount of chlorine required for each 100 ft. of pipe of various diameters. Solutions of 1% chlorine shall be prepared with Sodium Hypochlorite. During the application of chlorine, valves shall be closed so that the strong chlorine solution in the main being treated will not flow into water mains in active service. Chlorine application shall not cease until the entire main is filled with heavily chlorinated water. The chlorinated water shall be retained in the main for at least 24±4 hours, during which time all valves and hydrants in the section treated shall be operated in order to disinfect the appurtenances. At the end of this 24±4-hour period, the treated water in all the portions of the main shall have a residual of not less than 10 mg/L of free chlorine.

Table 2 Chlorine Required to Produce 25 mg/L Concentration in 100 feet of Pipe by diameter

Pipe size (in.)	Volume (gals in 100 feet of Pipe)	15% Chlorine solution gals per 100 feet of Pipe	1% Chlorine solution gals per 100 feet of Pipe
4	65	2 oz.	0.2 (1 ½ pts)
6	150	3 oz.	0.4(1 ½ qts)
8	260	5 oz.	0.6 (2 ½ qts)
10	410	1 cup	1.0 Gal
12	590	1 Pint	1.4
16	920	1Quart	2.3
24	2350	1 ½ Quarts	5.8
30	3680	2 ½ Quarts	9.1
36	5290	0.9	13.0
42	7200	1.2	18.0
48	9400	1.5	23.0
54	11900	2.0	30.0
60	14690	2.5	36.0

NOTE: To make 1% chlorine solution. Using Sodium Hypochlorite, dilute the hypochlorite according to the percent available chlorine on the container. For example, if you have 5% household bleach, place 1 gallon in 4 gallons of water. You then have 5 gallons of 1% solution.

7.5.2 Slug Method (Emergency Use Only)

At a point not more than 10 ft. downstream from the beginning of the new main, water entering the new main shall receive a dose of chlorine fed at a constant rate such that the water will have not less than 100 mg/L of free chlorine. To assure that this concentration is provided, the District representative shall measure the chlorine concentration at regular intervals along the main where taps and/or hydrants have been provided. The chlorine shall be applied continuously and for sufficient period to develop a solid column or 'slug' of chlorinated water that will, as it moves through the main, expose all interior surfaces to a concentration of approximately 100 mg/L for at least 3 hours.

The free chlorine residual shall be measured in the slug as it moves through the main. If at any time it drops below 50 mg/L, the Contractor shall stop the flow, chlorination equipment shall be relocated at the head of the slug, and as flow is resumed, chlorine shall be applied to restore the free chlorine in the slug to not less than 100 mg/L.

As the chlorinated water flows past fittings and valves, related valves and hydrants shall be operated so as to disinfect appurtenances and pipe branches.

7.6 Flushing After Disinfection
After the applicable retention period, the heavily chlorinated water shall be flushed from the main into the sewer until chlorine measurements show that the concentration in the water leaving the main is no higher than that generally prevailing in the system. Where domestic sewers are not available, the heavily chlorinate shall be dechlorinated. The replacement water shall be allowed to remain in the pipeline for 24 hrs.(+/- 4 hrs.) prior to sampling for physical, bacteriological, and chemical testing.

7.7 Analytical Tests
After the appropriate retention time (24±4 hours or 3 hours for the slug method), after flushing and before the water main is placed into service, a sample or samples shall be collected for sanitary analysis by a District representative. Suitable sample piping shall be furnished by the Contractor to allow sample collection. The sampling point or points shall provide samples, which are representative of the water in all sections of the main for which sanitary approval is requested. All samples shall be collected in a manner as to avoid contamination from the environment surrounding the main. Rubber or synthetic hose shall not be connected to the main to collect a representative sample. The area around the sampling point of the main shall not be filled with water. At least one sample shall be taken from each main, and in the case where a main is greater than 1000 feet, one sample from each 500 feet of line. The samples shall be submitted to the District Laboratory for bacteriological, chemical, and physical analysis. The following analyses shall be completed and reported on the appropriate form. Total chlorine residual, Total Coliform (Membrane Filtration method), pH, and turbidity.

7.8 Final Flushing
Disinfected water mains shall be flushed within 4 hours of being placed into service. Flushing shall be designed to restore water quality to that of the source water, immediately prior to being placed into service. The length of time of flushing shall depend on the size and length of the water main, however at least three volumes of water should flow through the entire length of the main. Pipe volumes can be calculated by using Table 2 and adjusting for the full length of the main.

7.9 Redisinfection
If the initial disinfection and flushing fail to produce satisfactory analytical results, the main may be reflushed and shall be resampled. If check samples show the presence of coliform organisms, then the main shall be rechlorinated by the Contractor, using the continuous feed method of chlorination, until satisfactory results are obtained.

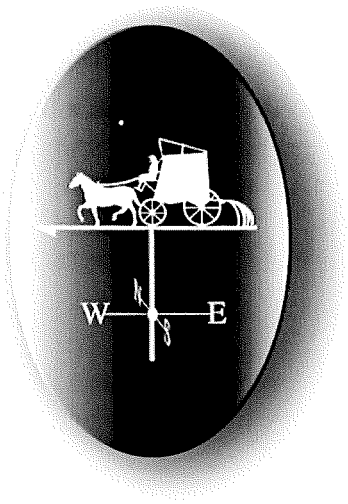
7.10 Miscellaneous
The District Laboratory, at no expense to the Contractor, will analyze two sets of samples. However, should the initial disinfection fail to produce satisfactory samples, a charge of $100 will be made to the Contractor for each set of additional samples required.

7.11 Final Connection
Water mains and appurtenances must be completely installed, flushed, tested for leakage, disinfected, and satisfactory bacteriological sample results received prior to permanent connections being made to the active distribution system where the new main was isolated from the existing system. Sanitary construction practices must be followed during installation of the final connection to insure that there is no contamination of the new or existing water main with foreign material or groundwater.

The new pipe, fittings, and valve(s) required for the connection will be spray-disinfected or swabbed with a minimum 1 – 5% solution of chlorine just prior to being installed.

7.12 Dechlorination
Contact the local sewer authority before discharging the highly chlorinated water to the sewer. The discharge of water to the environment with chlorine concentrations greater than the ambient distribution system chlorine residual is prohibited. The highly chlorinated water must be dechlorinated before being discharged to the environment.

SECTION III: Water Main Materials Specifications



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NOTE:

- All installations shall follow manufacturer's recommended procedures unless otherwise noted or directed by PWD personnel.
- All materials, products and coating that contact drinking water shall be certified to meet NSF/ANSI Standard 61 – *latest revision*, Drinking Water System Components – Health Effects.

BOLTS AND NUTS

GENERAL SPECIFICATIONS

General Description of Properties Required:

1.0 Stainless Steel: Type 304 – contains the addition of Molybdenum to the nickel-chromium steels.

2.0 High Strength/Low Alloy Steel: Trade name for cold formed T-head bolts containing alloying elements such as copper, nickel, and chrome (Cor-Ten).

CAST IRON OR DUCTILE IRON SPLIT REPAIR SLEEVE

GENERAL SPECIFICATIONS

1.0 Split repair sleeve shall be mechanical joint.

2.0 The side rubber gaskets shall be rectangular to cross-section and shall fit into grooved channels in the casting. These gaskets shall extend the entire length of the sleeve.

3.0 Split repair sleeve shall be AB-CD pattern to permit use of plain rubber and duck-tipped gaskets for various O.D. piping sizes.

4.0 Mechanical joint with accessories furnished; glands, gaskets and Cor-Ten T-bolts and nuts or equal.

5.0 All side bolts shall be Stainless Steel (Type 304) or silicone bronze.

6.0 Interior and exterior to be bituminous coated with a minimum of 4 mils D.F.T.

7.0 The sleeve shall be provided with a 2" F.I.P.T. test port with brass plug.

APPROVED MANUFACTURERS

A. All Manufacturers

CORPORATION STOPS

GENERAL SPECIFICATIONS

1.0 Conforming to AWWA C-800.

2.0 ¾" to 2" curb stops shall be ball valve design with brass ball that is teflon coated or brass ball with teflon seats.

3.0 The ball shall be supported by seats which are water tight in either direction.

4.0 The valve shall have a full port opening.

5.0 The body of the corporation stop shall be of heavy duty design.

6.0 The valve working pressure shall be 300 p.s.i.

APPROVED MANUFACTURERS

A. A.Y. McDonald
B. Cambridge Brass
C. Ford Meter Box Co.
D. Mueller Co.

CURB STOPS

GENERAL SPECIFICATIONS

1.0 Conforming to AWWA C-800

2.0 ¾" to 2" curb stops shall be ball valve design with brass ball that is teflon coated or brass ball with teflon seats.

3.0 The ball shall be supported by seats which are water tight in either direction.

4.0 The valve shall have a full-port opening.

5.0 The valve shall open with ¼ turn (90°) with a check or stop.

6.0 The valve shall not have a drain.

7.0 The valve stem shall have 2 "O" rings and a bronze ring lock which holds the stem solidly in the valve body.

8.0 The valve body shall be of heavy duty design.

9.0 The valve working pressure shall be 300 p.s.i.

APPROVED MANUFACTURERS

A. A.Y. McDonald
B. Cambridge Brass
C. Ford Meter Box Co.
D. Mueller Co.

CUT-IN SLEEVE

GENERAL SPECIFICATIONS

1.0 The sleeve shall be mechanical joint to plain-end type.

2.0 The sleeve shall fit over either AB or CD pattern pipe.

3.0 Coatings:
a) Interior – Seal-coated – AWWA C104-74, min. 4 mils D.F.T.
b) Exterior – Bituminous coated, min. 4 mils D.F.T.

4.0 Mechanical joint accessories shall be furnished:
a) Glands: Duck-tipped for AB pipe, Plain Gaskets for CD pipe
b) Cor-Ten tee bolts and nuts

5.0 Cut-in sleeves shall have at least one stop-screw in sizes up through 10" and at least 2 stop-screws in 12" size.

6.0 The stop-screw "O" ring shall be recessed into the body of the sleeve between stop-screw and body.

APPROVED MANUFACTURERS

A. Mueller Co.

DUCTILE IRON FITTINGS

INCLUDING BENDS, REDUCERS, OFF-SETS, TEES AND SLEEVES

GENERAL SPECIFICATIONS

7.0 Material shall be ASTM A536 latest, grade 70-50-05, in accordance with AWWA C110 (latest revision) for fittings larger than 24" and C153 (latest revision) for fittings 3" thru 24".

8.0 Fittings shall be cement lined AWWA C104 (latest revision) or fusion bonded epoxy coated with a 5 mil nominal thickness per AWWA C550 and C116.

9.0 Interior seal coated AWWA C104 with minimum of 4 mils dry film thickness.

10.0 Exterior bituminous coated, 4 mils minimum dry film thickness or fusion bonded epoxy coated with a 5 mil nominal thickness per AWWA C550 and C116.

11.0 Sleeves shall not be cement lined, but shall be bituminous coated inside to 4 mils dry film thickness. All sleeves shall be long body type.

12.0 Mechanical joint with accessories furnished: D.I. glands, gaskets, Cor-Ten T-bolts and nuts.

13.0 Pressure Ratings:
a) Class 350 pressure rating in accordance with AWWA C153 - 3"-24" sizes.
b) Class 250 pressure rating in accordance with AWWA C110 - 30"-48" sizes.

14.0 The "compact design" fittings must provide adequate space for the MJ joint and accessories to be installed without special tools (i.e. Lowell wrench can be used).

APPROVED MANUFACTURERS

A. All Manufacturers

DUCTILE IRON PIPE

GENERAL SPECIFICATIONS

1.0 Ductile iron pipe shall meet requirements of AWWA Standard C-151 (latest revision) and be cement lined and seal coated to meet AWWA Standard C-104 (latest revision).

2.0 Joints shall meet requirements of AWWA C-111 (latest revision).

3.0 Interior seal coated, bituminous paint oil cut, emulsion not acceptable, thickness minimum of 2 mils dry film thickness.

4.0 Exterior bituminous coated with minimum of 2 mils dry film thickness.

5.0 Class 52 wall thickness, 4-inch diameter through 12-inch diameter inclusive.

6.0 Ductile Iron Pipe with diameters 16-inches and larger shall be approved by PWD.

7.0 State nominal laying length and mark shorter lengths near bell.

8.0 Mechanical joint pipe to be furnished with gland, gaskets and Cor-Ten bolts and nuts.

APPROVED MANUFACTURERS

A. American Cast Iron Pipe
B. Griffin Pipe
C. U.S. Pipe
D. Clow Pipe
E. McWain Pipe
F. Atlantic States Pipe

FIRE HYDRANT

GENERAL SPECIFICATIONS

1.0 The hydrant shall open right.

2.0 The operating nut shall:
a) be D.I. or bronze
b) be pentagon in shape with dimensions: Top 1-13/16" tapering to 1-7/8" on bottom.

3.0 Nozzles shall be:
a) 2 each – 2-1/2" National Standard Thread
b) 1 each – 4-1/2" National Standard Threadbottom.

4.0 Port covers shall be supplied without chains and shall have the same size pentagon operator as specified in 3.0(b) above.

5.0 Traffic model hydrant with breakaway feature

6.0 Barrel length(s) shall be:
a) 6 ft. cover, 6-1/2 ft. bury; or
b) 5-1/2 ft. cover, 6 ft. bury, or
c) 5 ft. cover, 5'-6" bury

7.0 Hydrant shoe or base shall have the following:
a) 6" MJ inlet;
b) 5-1/4" valve opening with non-draining bronze seat that is permanently plugged;
c) valve seat and sub-seat arrangement shall be bronze to bronze;
d) Horizontal and vertical blocking planes manufactured into hydrant base

8.0 Bolts:
a) all buried mechanical joint bolts and nuts (T-head, etc.) shall be Cor-Ten or equal;
b) all buried flange joint bolts shall be stainless steel (Type 304) or silicone bronze.

9.0 Protective Coatings shall consist of the following:
a) all paintings and coatings shall be a minimum of 3 mils total dry film thickness, unless noted
b) the internal area of the hydrant base, which is normally exposed to water and which includes the internal body of hydrant shoes, including lower valve plate, shall be epoxy coated
c) all internal and external cast iron or ductile iron components shall be coated with an approved bituminous coating, 3 mils minimum
d) Coatings for upper barrel - exterior:
   1. Surface preparation blast clean SSPC-SP-6
   2. Primer Sherwin Williams Red Oxide E61RC21, 1.5 mils, dry
   3. Finish coat Sherwin Williams – Regal Yellow, F78Y30, 1.5 mils, dry or sufficient paint to hide the second coat
   4. Total dry film thickness - 3 mils minimum.
e) Coatings for bonnet, operating nut, port cap:
   1. Surface preparation: Blast clean, SSPC-SP-6
   2. Exterior primer
   3. Exterior aluminum
   4. Total dry film thickness: 3 mils minimum.

10.0 Flow Indicator Collars: PWD personnel shall install flow indicator collars on all new hydrants.

FIELD TEST OF INSTALLED HYDRANT

1.0 Hydrant flow shall completely stop with no more than 200 ft. lb. of torque applied to the operating nut.

2.0 Failure to shut completely at no more than 200 ft. lb. of torque will be cause for rejection of that hydrant.

APPROVED HYDRANTS

A. Clow Eddy – with lower stern machined from bar stock
B. American Darling Models: B62B-1, B62B-5

PIPE JOINT RESTRAINER

GENERAL SPECIFICATIONS

1.0 Pipe Restraints:

1.1 Use in conjunction with mechanical joint fittings.

1.2 The joint restraint ring and its wedging components shall be made of ductile iron conforming to ASTM A536-80.

1.3 Dimensions of the restrainer must allow use with standard M.J. bell conforming to AWWA C111 and AWWA C153.

1.4 Restrainer must restrain up to 350 psi of working pressure in 3" to 16" sizes and 250 psi of working pressure in 18" to 48" sizes with a 2:1 safety factor.

1.5 Torque limiting twist off nuts shall be used to ensure proper actuation of the restraining wedges (used on a,b,c below).

APPROVED MANUFACTURERS

A. Sigma Super Lug
B. Ford Uni-Flange Series 1400
C. Ebba Mega Lug
D. Romac Grip Ring
E. Star Grip Series 300
F. Romac Romagrip
G. MJ FIELD LOK Gasket

POLYETHYLENE ENCASEMENT

GENERAL SPECIFICATIONS

1.0 Tube type polyethylene encasement shall be installed on all ductile iron pipe and fittings in accordance with AWWA Standard C105 - latest revision, Method A.

2.0 Polyethylene encasement shall be either linear low-density polyethylene (LLDPE) film with a minimum thickness of 8-mil or high-density, cross-laminated polyethylene (HDCLPE) film with a minimum thickness of 4-mil.

3.0 Circumferential wraps of tape or plastic tie straps shall be placed at 2-ft. intervals along the barrel of the pipe.

4.0 The polyethylene encasement shall prevent contact between the pipe and the surrounding backfill and bedding material but is not intended to be a completely airtight or watertight enclosure. All lumps of clay, mud, cinders, and so forth, on the pipe surface shall be removed prior to installation of the polyethylene encasement. During installation, care shall be exercised to prevent soil or embankment material from becoming trapped between the pipe and the polyethylene.

5.0 The polyethylene film shall be fitted to the contour of the pipe to effect a snug, but not tight, encasement with minimum space between the polyethylene and the pipe. Sufficient slack shall be provided in contouring to prevent stretching the polyethylene where it bridges irregular surfaces, such as bell-spigot interfaces, bolted joints, or fittings, and to prevent damage to the polyethylene due to backfilling operations. Overlaps and ends shall be secured with adhesive tape, string, plastic tie straps, or any other material capable of holding the polyethylene encasement in place until backfilling operations are complete.

6.0 Three layers of polyethylene adhesive tape shall be wrapped around any polywrapped pipe where a tapping machine will be placed. All copper services connected to a pipe wrapped in polyethylene encasement shall be wrapped within three feet of the pipe.

PVC WATER PIPE

GENERAL SPECIFICATIONS

1.0 For all water main installations that are less than 4" I.D. (4" and larger use ductile iron), the District will require use of 2" I.D. PVC plastic water pipe meeting the following: Under special site conditions the District does require the use of C-900 PVC in sizes larger than 4".

2.0 Pipe Specifications (2"):

2.1 Diameter:
- A. The I.D. shall be a minimum of 2"
- B. The O.D. shall be a maximum of 2.38"
- C. The minimum wall thickness shall be 0.113"

5.2 Pressure Rating
- A. The minimum working pressure rating shall be 200 PSI (SDR-21).
- B. The pipe shall conform to standard ASTM 2241.

1.3 Pipe Length
- A. The pipe shall be provided in 20' lengths.
  * Shorter lengths may be allowed and/or field cut following manufacturer's recommended procedures.

5.2 Gaskets
- A. The gasket or O-Ring material shall be rubber meeting ASTM F 477 and of the "permanent use" type.

3.0 Fittings:

3.1 Standard AWWA C900 fittings are not available in the 2" I.D. and therefore "steel pipe" class fittings, or Certa-Lok Yelomine couplings and fittings meeting ASTM D 3139 shall be used.

5.2 The normal nomenclature for "steel fittings" is Schedule 40 or Schedule 80, with the respective pressure ratings of 280 PSI and 400 PSI. Both of these fitting classes are acceptable for use.

4.0 Service Connections:

4.1 All service connections shall be made with tapping saddles* per Portland Water District specifications or by use of tees meeting the above noted fitting specifications.

5.0 Installation:

5.1 Follow manufacturer's instructions.

5.2 An eight gauge bare copper wire shall be fastened to the buried PVC pipe to facilitate electronic pipe locating. The wire shall be fastened at two locations per length and not at any joint.

6.0 The District requires 200 PSI (SDR-14) PVC pipe for other sizes such as 4", 6", 8", and 12". Pipe shall conform to AWWA C-900.

APPROVED MANUFACTURER / TYPE

A. J-M Manufacturing - Blue Brute
B. Certainteed - Yelomine
C. Victaulic - Aquamine
D. IPEX – Blue Brute

RESILIENT SEATED GATE VALVE

GENERAL SPECIFICATIONS

1.0 Valve shall meet the latest revision of the AWWA C-509 Standard.

2.0 Valve shall have a smooth unobstructed water way which shall be a minimum diameter of the valve.

3.0 Valve ends to be specified and shall be furnished with Cor-ten (or equal) bolts and nuts.

4.0 Valve shall be rated for zero leak rate at 200 psi differential working pressure and have a 400 psi hydrostatic test for structural integrity.

5.0 Sealing - Valve shall have a minimum of 2 "O" rings situated such that the "O" rings above the thrust collar can be replaced with the valve under pressure and in the open position.

6.0 Stem - Valve stem shall:
- a) open right with a stem nut made of grade D,E manganese bronze;
- b) be non-rising;
- c) be designed with a thrust collar integrally cast to the stem;
- d) be designed with two (2) thrust washers, placed one above and one below the stem thrust collar;
- e) be constructed of grade D,E manganese bronze;
- f) be such that the thrust washers are made of a synthetic polymer with physical properties required.

7.0 Valve Body - The body, including the stuffing box and the bonnet, shall be constructed of cast iron or ductile iron, meeting the latest revision of AWWA C-153.

8.0 Valve Wedge:
- a) shall be constructed of ductile iron (less guiding mechanism);
- b) shall be fully encapsulated and permanently bonded with a resilient elastomer;
- c) shall be constructed such to allow the flushing of any interior exposed surface during operations.

9.0 Coatings:
- a) the internal and external valve body, including the stuffing box, bonnet, and interior of the wedge shall be fusion bonded epoxy coated with 8 mils D.F.T.
- b) interior shall meet latest version of AWWA C-550.
- c) shall be holiday free, interior and exterior, per testing method described in AWWA C-550, Sec. 5.1.

10.0 Operating Nut:
- a) shall be two (2) inch square ductile iron:
  - 2. with a countersunk hold down nut (made of 316 stainless steel or silicone bronze). This applies to stems that are tapered; or
  - 3. with a stainless steel pin inserted thru the stem. This applies to stems of full diameter.

11.0 Bolts – The seal plate and bonnet bolts shall be stainless steel (Type 316 or Type 304).

12.0 Valves 12" nominal diameter and smaller shall be directly operated by the nut on the valve stem and mounted vertically. Number of turns to open or close shall closely match the formula: (3 x D) + 2. For example, a 12" valve should open or close with approximately (3 x 12) + 2 = 38 turns of the operating nut.

13.0 Valves larger than 12" nominal diameter shall be designed to be installed horizontally and shall have bevel gear operators driven by the operating nut. Valves 14" – 24" nominal diameter shall have 4:1 bevel gear operators. Valves with 30" – 36" nominal diameters shall have 6:1 bevel gear operators and valves with 42" – 48" nominal diameters shall have 8:1 bevel gear operators. Number of turns to open or close shall closely match the formula: ((3 x D) + 2) times the bevel gear ratio. For example, a 24" valve should open or close with approximately ((3 x 24) + 2) x 4 = 296 turns of the operating nut.

GENERAL PROVISIONS

1.0 Vendor shall identify any and all exceptions to the specifications.

2.0 Vendor shall provide standard brochures for item quoted.

3.0 Vendor may be required to supply a valve for inspection and determination of coating process.

APPROVED RESILIENT SEATED GATE VALVES

A. U.S.P.
B. AFC Series 2500
C. Mueller A-2360/61
D. Clow Series F6100

RESTRAINED JOINT GASKETS

GENERAL SPECIFICATIONS

1.0 All accepted restrained joint gaskets in the Portland Water District distribution system shall be rated in accordance with the performance requirements of ANSI/AWWA C111/A21.11.

2.0 Required Applications

2.1 Any hydrant branch or service with a distance greater than 18' shall have an approved restrained joint gasket in the bell ends.

2.2 Where a casing is required, all joints within the casing shall have an approved restrained joint gasket unless restrained joint pipe is used.

2.3 At any time as required by a PWD Engineer.

2.4 Any live service tap where there is a joint between the connection and the end of the service.

APPROVED MANUFACTURERS

A. American Fast-Grip Gasket – American Pipe
B. Field Lok 350 Gasket – US Pipe

SERVICE BOX AND ROD

GENERAL SPECIFICATIONS

Reference Standard Details

1.0 Service Box - Approved Manufacturers: Laroche, Clow Canada, Bibby

1.1 Shall be 1.0" Schedule 40 steel pipe with top having 1.0" N.P.T. pipe threads for screw-on cover or coupling.

1.2 Shall be Erie style with 6' slide-type riser.

1.3 Any extension of a service box requires a threaded merchant coupling with no set screw.

2.0 Service Box Cover – Approved Manufacturers: Bibby, Laroche, Clow Canada, QWP

2.1 Shall be Quincy type (heavy duty) cover that screws on Service Box (1.1 above).

2.2 Shall be tapped with a 1" rope thread with a solid brass plug with pentagon operating head.

3.0 Service Box Foot Piece – Approved Manufacturer: Laroche

3.1 The standard foot piece shall be heavy duty (Ford style or equal) cast iron design.

3.2 The large, heavy-duty foot piece shall have an arch that will fit over 2" ball-valve curb stops.

4.0 Service Rod – Approved Manufacturer: North American Manufacture

4.1 Shall have a self aligning design.
a) 36" length for all services.
b) 24" length for air valves.

4.2 Shall be round and constructed of stainless steel (304) with an epoxy coating (minimum 4 mil D.F.T.).

4.3 Shall have a yoke design that is an integral part of the rod.

4.4 The curb-stop attachment pin shall be a brass cotter pin.

4.5 The rod "wrench-flat" shall have a minimum thickness of ¼" tapered to 1/16" and width of 5/8" or ½".

4.6 Diameter
a) ½", ¾" and 1" services use ½" diameter.
b) 1 ½" and 2" services use 5/8" diameter.

SERVICE SADDLES

GENERAL SPECIFICATIONS FOR DUCTILE IRON PIPE

1.0 The service saddle shall have the "larger sized" body, the same as associated with the "service repair" saddle, which shall have a minimum diameter of 6 in. and multiple "O" ring type sealing.

2.0 The saddle body shall be constructed of epoxy coated ductile iron.

3.0 The sealing gasket(s) shall be either Buna-N rubber or SBR rubber (ASTM D2000).

4.0 Service saddles shall be installed with all 1 1/2" and 2" corporation stops (cc only).

Approved Manufacturers

Size	Tap	Saddle
2" – 2-1/4"	¾", 1" cc	Smith-Blair 315, Ford FC 202
4" - 12" D.I.	¾"- 11/2" cc	Smith Blair 331
4" - 12" D.I.	2" cc	Smith-Blair 313
16"	¾"-2" cc	Smith-Blair 313
20" – 36"	¾"-2"cc	Smith-Blair 366

GENERAL SPECIFICATIONS FOR PVC PIPE

1.0 Stainless steel straps will be used on saddles on C-900 PVC Pipe

Approved Manufacturers

Size	Tap	Saddle
2" – 2-1/4"	¾", 1" cc	Smith-Blair 315, Ford FC 202
4"-12"		Smith-Blair 265

GENERAL SPECIFICATIONS FOR HDPE PIPE

1.0 Spring washers are required for service saddles on HDPE Pipe.

Approved Manufacturer

Size	Tap	Saddle
4"-12"		Smith-Blair 265

STAINLESS STEEL REPAIR CLAMPS

GENERAL SPECIFICATIONS

1.0 The sleeve shall be of full circle design, either one piece or two piece, for pipe sizes 2" thru 12".

2.0 Body: Shall be 18-8 stainless steel shell.

3.0 Gasket:
- a) Shall be full length and diameter of the body size;
- b) This gasket shall form a multiple O-ring, or grid, sealing barrier for the entire length and circumference;
- c) Shall be virgin SBR rubber (ASTM D2000 AA 415).

4.0 Lugs, sidebar, and lifting bar shall be heavy gauge 18-8 stainless steel with TIG/MIG welding and chemical passivation of all welds.

5.0 Bolts and Nuts shall be Teflon coated 18-8 heavy gauge stainless steel.

6.0 Armor: The armor, or bridging plate between the side bars shall be heavy gauge 18-8 stainless steel bonded to the gasket to bridge the lug area.

APPROVED MANUFACTURERS

A. All Manufacturers

TAPPING SLEEVES

GENERAL SPECIFICATIONS

1.0 For sizes 12" and smaller tapping sleeve shall be ductile iron or approved fabricated steel:

1.1 Tapping sleeve shall be mechanical joint with recessed outlet flange for tapping valve.

1.2 Tapping sleeve shall conform to AWWA C-207, Class D, with rated maximum working pressure of 200 psi.

1.3 The side rubber gaskets shall be rectangular in cross-section and fit into grooved channels in the casting. These gaskets shall extend the entire length of the sleeve and shall not require cutting or trimming to match MJ end gaskets.

1.4 Tapping sleeve shall be AB-CD pattern to permit use of plain rubber and duck-tipped gaskets for various O.D. piping sizes.

1.5 Mechanical joint with accessories furnished; glands, gaskets, and Cor-Ten T-bolts and nuts or equal.

1.6 All flange outlet bolts shall be stainless steel (Type 304).

1.7 Interior and exterior to be bituminous coated with a minimum of 4 mils dry film thickness or fusion bonded epoxy coated.

1.8 The sleeve shall be provided with a ¾" F.I.P.T. test port and brass lug.

2.0 For sizes 16" and larger tapping sleeve shall be fabricated steel:

2.1 Body and Flange - A-36

2.2 Coating - Fusion-bonded epoxy coating with minimum D.F.T. of 5 mils, inside and out.

2.3 Bolts, Nuts - Stainless Steel (Type 304).

2.4 Gaskets - SBR.

2.5 Flange - AWWA Class D plate flange with ANSI 150# drilling, proper recessing for tapping valves.

2.6 Sleeves shall be provided with 3/4" F.I.P.T. test port and plug.

APPROVED MANUFACTURERS (4"-12")

A. AFC
B. Mueller Co.
C. U.S. Pipe
D. Tyler / Union
E. Powerseal Model 3490 and 3490MJ (Fabricated Steel)

APPROVED MANUFACTURERS (16" and larger)

A. Romac FTS 420
B. Ford FTSC
C. Smith Blair 622
D. JCM 412
E. Powerseal Model 3490 and 3490 MJ (up to 24")
F. JCM 415 or approved equal (for RCCP pipe only)

VALVE BOXES

GENERAL SPECIFICATIONS

Reference Standard Details

1.0 The valve box bottom section shall be slide-type with bell-type base with bottom lip.
Manufacturer: North American Manufacture

2.0 The valve box top section shall be slide-type, 36 inches long (minimum). No top flange and no "bead" or bottom flange.
Manufacturer: North American Manufacture

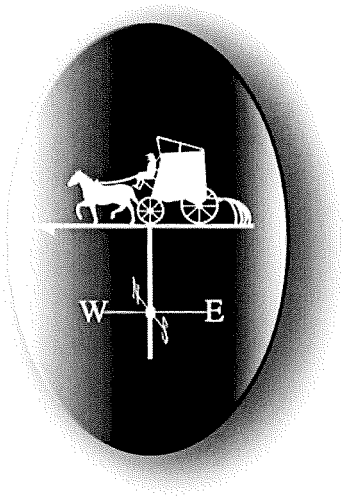
3.0 The valve box cover shall be a 2" drop-type cover to fit the 7-1/4" opening of the top section.
Manufacturer: Bibby St-Croix (no substitute)

4.0 The valve box intermediate (mid) section shall be slide-type with a minimum 3" belled bottom. Base section No. 645 may be used as an alternate.
Manufacturer: North American Manufacture

5.0 Material shall be cast iron or ductile iron free from defects.

6.0 Interior and exterior of all components shall be bituminous coated with a minimum of 4 mils dry film thickness.

SECTION IV: Documents



PORTLAND WATER DISTRICT
225 Douglass Street – P.O. Box 3553
Portland, ME 04104-3553
(207) 774-5961

CERTIFICATE OF TITLE AND PROJECT ACCEPTANCE

KNOW ALL MEN BY THESE PRESENTS: that a corporation doing business as _____ of _____, and State of Maine, hereinafter called "DEVELOPER" and a corporation doing business as _____ of _____, County of _____, and State of Maine, hereinafter called "CONTRACTOR" in consideration of One Dollar ($1.00) and other valuable considerations paid by PORTLAND WATER DISTRICT (the "DISTRICT"), a quasi-municipal corporation with a principal office in Portland, Maine, the receipt of which consideration is hereby acknowledged, does hereby GRANT, SELL, TRANSFER, AND DELIVER unto the said DISTRICT, its successors and assigns, the following personal property:

New ____ water main extension in _____ in _____, Maine.
____ new ____ inch domestic water services installed from the new mains.
____ public hydrants.

TO HAVE AND TO HOLD, all of the said personal property to the said PORTLAND WATER DISTRICT, its successors and assigns to its and their own use and behold forever.

AND, the developer/Contractor hereby covenants with the said DISTRICT, its successors and assigns, that it is the lawful owner of all the said personal property, that it is free from all encumbrances; that Developer/Contractor has good right to sell the same as aforesaid; and that it will WARRANT AND DEFEND the same unto the DISTRICT, its successors and assigns against the lawful claims and demands of all persons.

AND, the said PORTLAND WATER DISTRICT, having inspected the installation of the said personal property, finds that it substantially complies with the terms of the agreement between the District, the Developer and the Contractor dated as of the ____ day of _____, 20__.

This date shall mark the commencement of all warrantees and guarantees required by the Contract Documents and such warrantees and guarantees shall be fully effective, notwithstanding the fact that the District has inspected such property.

IN WITNESS WHEREOF, the parties hereto have caused this Certificate of Title and Project Acceptance to be executed by their duly authorized officials.

PORTLAND WATER DISTRICT

By _____

_____ witness

_____ title

_____ developer

By _____

_____ witness

_____ title

_____ developer

By _____

_____ witness

_____ title

PORTLAND WATER DISTRICT
225 Douglass Street – P.O. Box 3553
Portland, ME 04104-3553
(207) 774-5961

MAIN EXTENSION AGREEMENT (Developer)

Agreement No.
F.C.W.O No.

THIS AGREEMENT made this ___th day of _____ _____ by and between the Portland Water District, a quasi municipal corporation located at Portland, Maine, hereinafter called the "District", and _____ of _____, ME hereinafter called _____.

ID/SS#:

W I T N E S S E T H:

WHEREAS, the Depositor desires to have the District extend its water facilities in the City of _____, County of Cumberland and State of Maine, as follows:

Install ___ DI water main in _____
Install ___ public fire hydrants .
Install ___ 1" domestic services.

Deposit required $ _____.00

WHEREAS, the Water Main Extension Rules of the Maine Public Utilities Commission require a written agreement for such extension.

NOW THEREFORE, in consideration of the mutual promises hereinafter set forth, the parties agree as follows:

1) Prior to the construction of facilities, the Depositor shall advance with the District the sum of **$ __,_____.00,** which sum is the District's estimated cost of construction of said water main extension and related appurtenances, fire protection, service and meter. Said sum shall be deposited in two installments as follows:

a) Upon execution of this Agreement, an advance in the sum of $ N/A, to cover the costs of materials and supplies and detailed engineering design, which advance is not refundable to the extent that any portion of the advance is actually spent by the District for detailed engineering design or for materials and supplies which cannot readily be used by the District for other projects;

2) Water facilities constructed under this agreement, located outside of the development, are subject to refundable customer contributions. During a ten-year period after the connection of the first customer to the main extension, each new customer connected to the outside facilities will pay a customer contribution as calculated pursuant to rule of the Public Utilities Commission prior to obtaining service. The contribution will be collected by the District and forwarded to the Depositor(s). (See reverse side of this form for PUC contribution calculation).

3) Where the facilities are being installed in other than an accepted public way, the Depositor shall furnish the District, from the owner of record, a properly executed permanent easement, free of encumbrances, entitling the District to construct, own, operate, maintain, repair and replace the above-described facilities.

4) The District shall construct, in the normal course of its operations, the above-described water main, public fire protection allocation and service, after receipt of such advance, provided the Depositor furnishes suitable access to the site, and at the request of the Director of Engineering of the District, line stakes and grade stakes at the site.

5) Within 60 days following the District's determination of the final expenses incurred for the extension, including main, public fire protection allocation and service, the advance made hereunder shall be adjusted to the actual cost of construction, either by the District's return to the Depositor of any excess amount, or by additional payment to the advance by the Depositor to the District covering the deficiency.

6) If the lines and grades of the street or way are not acceptable by the municipality and the utility, or valid permanent easements covering the water main extension satisfactory to the District have not been executed, the District reserves the right to use any remaining advance towards upgrading the main to meet utility specifications. The District reserves the right not to accept a main until it has been inspected and tested and meets utility specifications. Any inspection or test shall be at the expense of the person requesting service or acceptance. The District further reserves the right to refuse to commence water service until the main has been brought up to utility specification.

7) The District shall bill or deduct from any advance refund otherwise due the Depositor, (i) the cost of any relocation of the District's facilities due to any change of the line or grade of any street or way; and (ii) any costs of the District for repairing or rebuilding facilities of the District at the above-described location if damaged by the Depositor or his agent at any time prior to acceptance of the street or way by the municipality.

8) The District shall have full ownership of all of the facilities constructed pursuant to this agreement. The District will have a continuing obligation for the future maintenance of these facilities, and the right to make further extensions continuously and laterally from said extension without obligation to this agreement.

9) This contract is subject to the rules of the State of Maine Public Utilities Commission governing water main extensions (65-407 C.M.R. 65), which are hereby incorporated by reference into this contract. In the event of a conflict between this contract and the Commission's water main extension rule, the rule shall govern. The parties understand that the provisions of this contract are subject to alteration by a decision or rule of the Public Utilities Commission.

10) Disputes arising under this contract or under the Public Utilities Commission water main extension rule may be referred pursuant to that rule to the Commission for resolution.

11) This Agreement shall bind and inure to the benefit of the heirs, executors, administrators, successors and assigns of the parties hereto. Words of the singular number may include the plural, and words of the plural number may include the singular.

IN WITNESS WHEREOF, the parties hereto, being duly authorized, have hereunto set their hands the day and year first above-written.

WITNESS:

PORTLAND WATER DISTRICT

By

_____

_____

Its
Depositor

_____

_____

Customer Contributions by Customers Outside Development: If a main extension must cross property other than that within the development prior to reaching the development, and customers located on the property outside the development are connected to the main extension within ten years following connection of the first customer at any location on the extension, those customers shall be required to make a customer contribution. The total cost of the main extension shall be allocated between the development and the area outside the development on the basis of the number of feet within the development and the number of feet outside the development. After determining the total cost of the portion of the main extension outside the development on the basis of this allocation, customers outside the development should be required to make a contribution. For the purpose of determining the contribution or reallocating contributions when subsequent customers outside the development are connected, the developer shall be considered the equivalent of the number of customers within the development or the number of services constructed, whichever is greater, as if all those customers or services were located at the termination of the portion of the extension located outside the development. If a development is master metered, the number of customers within the development, for purposes of this subsection, shall be considered as the number of residential, commercial or industrial units or establishments.

PORTLAND WATER DISTRICT
225 Douglass Street – P.O. Box 3553
Portland, ME 04104-3553
(207) 774-5961

THREE PARTY AGREEMENT

THIS AGREEMENT made this ___th day of _____ _____ by and between the Portland Water District, hereinafter called "the DISTRICT", acting herein through its General Manager, and _____ _____ _____ doing business as _____ of _____, County of _____, and State of Maine, hereinafter called "Developer" and _____ _____ _____ _____ doing business as _____ of _____, County of _____, and State of Maine hereinafter called "Contractor".

The Developer and Contractor are hereinafter referred to as the "Developer/Contractor" and their obligations and liability under this Agreement shall be joint and several.

W I T N E S S E T H:

That for and in consideration of the payments and agreements hereinafter mentioned:

1) The Developer/Contractor will commence and complete the construction of: instillation of water fixtures, such as mains, services and hydrants in _____ in _____, Maine hereinafter called "the PROJECT".

2) The Developer/Contractor will furnish all of the material, supplies, tools, equipment, labor and other services necessary for the construction and completion of the PROJECT.

3) The Developer/Contractor will notify the District of his proposed starting and completion dates at least ten business days prior to the start of construction.

4) The Developer/Contractor agrees to perform all of the work described in the Contract Documents and comply with the terms therein at no direct cost to the District, except that the District will make refunds in accordance with the terms of Main Extension Agreement Number _____ dated _____.

5) The term "Contract Documents" means and includes the following

   a) Agreement
   b) Developer/Contractor's Schedule of Unit Prices
   c) Maintenance Bond
   d) Certificate of Title and Project Acceptance
   e) General Conditions
   f) Supplemental General Conditions
   g) Drawings prepared by - _____ Numbered - _____ and Dated - _____
   h) Specifications prepared or issued by the District.

The Schedule of unit Prices, Maintenance Bond, Certificate of Title and Project Acceptance, General conditions, Supplemental Conditions, Drawings and Specifications designated above are contained in the Portland Water District "Specifications and Procedures and their terms are expressly incorporated herein and made a part hereof.

6) Developer/Contractor shall reimburse fully and completely indemnify and save harmless the DISTRICT from any and all loss, damage, liability , claim, action, cost and expense (including attorneys' fees) caused by or arising out of the construction of the PROJECT, including without limitation any and all such costs and expenses incurred to assure the safety, protection and continuity of future operations which are deemed necessary by the DISTRICT, specifically including, but not limited to, costs of inspection.

7) The failure of the DISTRICT to enforce or insist upon compliance with any of the terms or conditions of this Agreement shall not constitute a general waiver or relinquishment of any said terms or conditions but the same shall be and remain in full force and effect at all times.

8) This Agreement contains the entire understanding of the parties with respect to the subject matter hereof and may not be amended or modified except by a writing signed by the parties.

9) This Agreement shall be governed by Maine law and shall be binding upon all parties hereto and their respective heirs, personal representatives, administrators and assigns.

IN WITNESS WHEREOF, the parties hereto have executed, or caused to be executed by their duly authorized officials, this Agreement in triplicate, each of which shall be deemed an original on the date first above mentioned.

SEAL

PORTLAND WATER DISTRICT

By _____

_____
witness

_____
title

SEAL

_____
developer

By _____

_____
witness

_____
title

SEAL

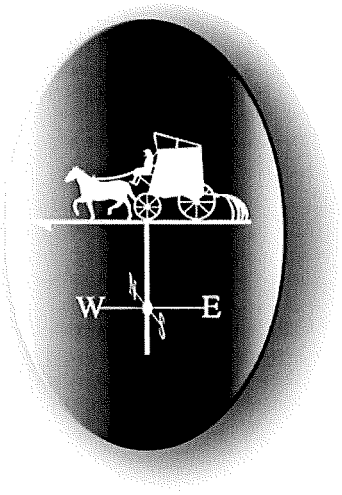
_____
developer

By _____

_____
witness

_____
title

SECTION V: Work Associated With Sewer Construction



A. GENERAL

1. PROJECT COORDINATION

The District provides wastewater collection, interception, and treatment services under a Charter and/or Agreements with its Member Municipalities. In general, the District will accept additional sewerage infrastructure when designed in accordance to State/Local Code, general engineering practice, and published District Standards and Details. This specification includes limited District standards intended to convey the general nature and quality of acceptable infrastructure.

All project submittals shall include a detailed design documenting the basis for the selection, sizing, and general design of the infrastructure. This shall include, at a minimum, the number of units and expected flows, factors and assumptions used in sizing sewers, force mains, pump stations, and other infrastructure.

All project submittals shall include a detailed project schedule that clearly identifies the dates or timeframes associated with Planning Committee Submittals and Approvals, construct start dates, testing and start-up of infrastructure, acceptance by the District, and expected commissioning of systems.

The District reserves the right to recover costs associated with the review of any submittals, analysis of capacity to serve, inspection, and field-testing and start-up. Any fees will be in accordance with the fee schedule published in Part II – Work Associated with Water Line Construction A. 1.

The District will not accept or operate any infrastructure until the project has been completed and tested in accordance with any submittals and District Standards and Details. As-built drawings must be provided before any infrastructure will be accepted or operated by the District.

2. INSPECTION

An inspector from the District, a consultant working for the District, or an inspector retained by the local municipality (with responsibility for the oversight of sewerage infrastructure to be installed) will be assigned to each project to ensure that all work is completed and materials are installed in compliance with all submittals and these specifications. During the course of the work the inspector will report to the Engineering Supervisor on the progress of the work. The District, or its representative, before incorporation into the work, must approve any deviation from the approved plans or specifications.

The Contractor shall schedule with the District for inspection services a minimum of 3 working days prior to construction. The District cannot guarantee an inspector for the project without this notice. Start-up and acceptance testing of systems will require a 14 working day notice.

B. DESIGN CRITERIA

In general, the District will accept additional sewerage infrastructure when designed in accordance to State/Local Code, general engineering practice, and published District Standards and Details. This specification includes limited District standards intended to convey the general nature and quality of acceptable infrastructure.

C. STANDARD SPECIFICATIONS AND DETAILS

1. SEWERS AND DRAINS

PART 1 GENERAL

1.01 This section shall define the standards associated with the following:

a. Sanitary sewer pipe

b. Forcemain pipe
c. House service pipes
d. Storm sewer pipe

1.02 RELATED WORK:

1.03 SUBMITTALS:

A. Manufacturer's product data and installation instructions.

B. Certified copies of tests on pipe units.

C. Construction Records: Record depth and location of the following:

1. House service capped ends, cleanouts, bends in house service, connection points to sewer main.
2. Bends, thrust blocks in force mains.
3. Repairs to existing pipes.

Record neatly in a permanently bound notebook and submit at Substantial Completion. Provide access to records for the District at all times. Submit copies to the District on a weekly basis.

PART 2 - PRODUCTS

2.01 PIPE AND FITTINGS:

A. General: Provide fittings of same type and class of materials as pipe. Provide commercially manufactured wyes or tee/wyes for service connections. Fitting must have single piece gasket.

B. PVC Non-Pressure Pipe and House Services (Sewer): 4" through 12" Diameter: ASTM D3034 or ASTM D3033, strength requirement SDR 35; push-on joints, ASTM D3212; gaskets, ASTM F477.

C. PVC Pressure Pipe (Forcemain):

1. Less than 3" Diameter: Must be approved by PWD prior to approval

2. Less than 4" Diameter: ASTM D2441, strength requirement SDR 21; push-on joints, ASTM D3139; gaskets, ASTM F477.

3. 4" Diameter and Larger: ASTM D2241, Class 150, strength requirement DR 18, with cast iron pipe outside diameters; push-on joints, ASTM D3132; gaskets, ASTM F477. All fittings to be ductile iron mechanical joint, AWWA C110 with 250 psi minimum pressure rating.

D. Storm Sewer Pipe: Polyethylene drainage pipe with corrugated exterior and smooth wall interior, highway grade, AASHTO M252, ASTM F405, by American Drainage Systems, or approved equal.

E. Reinforced Concrete Pipe: ASTM C76; Class IV, O-ring gasket joints with rubber gaskets, meeting MDOT specifications.

F. Ductile Iron Pipe: AWWA C151; thickness Class 52 AWWA C150; double cement lined, AWWA C104; push-on joints or mechanical joints with rubber gaskets, AWWA C111; fittings, AWWA C110.

G. Underdrain: Perforated, corrugated polyethylene pipe with smooth wall interior, AASHTO M252, ASTM F405, by American Drainage Systems, or approved equal.

2.02 MISCELLANEOUS:

A. Flexible Couplings: Use and location shall be approved by the District.

1. Type A: Dresser Style 53 as manufactured by Dresser, or approved equal.

2. Type B: Neoprene sleeve with stainless steel bands by Fernco, or approved equal.

B. Pipe Supports: Saddle type, steel, painted, adjustable, by ITT Grinnell, or approved equal.

C. Geotextile Fabric: Propex 4508 by Amoco Fabrics Co., or approved equal.

D. Forcemain Marking Tape: Lineguard III by Tri-Sales, Inc., 2" wide, green; detectable with magnetic locators, or approved equal.

E. Rigid Insulation: Extruded closed-cell rigid foamed polystyrene, 2 inch thickness, width of trench, Styrofoam HI-60, by Dow Chemical, or approved equal.

F. Air and Vacuum Valves:

1. Construction: Cast iron body and cover, ASTM A126; Stainless steel concave float, ASTM A240 T304; Stainless steel float stem, ASTM A581 T303; Buna-N needle and seat; Brass plug, ASTM B124. Operating pressure from 0 to 150 psi.

2. Outlet: 1-inch diameter. Provide a short nipple and a return elbow with piping as shown on the Drawings.

3. Inlet: 2-inch diameter. Provide taps, piping and valves as shown on the Drawing.

4. Coating: Red oxide phenolic primer paint.

5. Model: ACO 443 Sewage Combination Air Valve as manufactured by Valve and Primer Corporation, or approved equal.

PART 3 - EXECUTION

3.01 INSTALLATION OF GRAVITY PIPE AND FITTINGS:

A. Methods: Install in accordance with manufacturer's recommendations. Use a laser beam for line and grade unless otherwise permitted by the District. Secure each length of pipe with bedding before placing next length. Plug open ends

when work is suspended. Bed pipe as shown on Drawings. A 30-inch minimum cover over the top of PVC pipe and DIP pipe should be provided before the trench is wheel-loaded.

B. Grade and Line:

1. Grade and Line shall be sufficient to provide minimum velocities of 2.0 fps. Lay pipe to line and grade shown on the Drawings as reviewed and approved by the District. If grade is not shown, determine elevations of start and finish points for each run of pipe. Lay pipe to a uniform grade between these points.

2. Line and grade may be adjusted as approved by the District, when required by field conditions.

C. Conditions: Lay pipe in the dry. Do not use installed pipe to remove water from work area.

D. Flush and clean all pipe and remove all debris and materials. Flushing and cleaning methods shall be in accordance to District Standards and approved by the District. Gravity flushing is not acceptable.

E. Connections to Manholes and Catch Basins: Any connections shall be in accordance with District Standards. Connections to existing wastewater manholes and catch basins shall be performed under PWD Inspection. Connections shall be cored as opposed to being drilled/chiseled. Connections to existing structures must not result in additional infiltration. Any joints shall be located within 3 feet of inside surface of manholes and catch basins.

F. House Service Fittings and Leads:

1. Size of service leads 4" unless otherwise indicated.

2. Depth and location of service to be determined in field, as approved by the District.

3. Provide tee/wye or wye fittings on main line pipe. Extend services to a edge of Right-of-Way as determined by the District.

4. Provide clean outs as required.

5. Plug, or cap, and stake ends of new service. Provide stake that extends from plug or cap to 1 foot above ground surface. Provide the District with measurements of pipe installed and in obtaining swing ties to ends of leads.

6. All service connections must be shown on as-built drawings.

7. No residential service connections shall be allowed to tie into District owned sewer force mains.

3.02 INSTALLATION OF FORCEMAINS AND PRESSURE PIPE:

A. Grade and Line: Lay pipe to line and grade as approved by the District. Do not allow positive-negative grade discontinuities. See Article 3.01 B above.

B. Methods, Conditions, and Connections to Manholes: See Articles 3.01 above.

C. Install warning tape continuously from the pump stations to the end of each force main. At ends of rolls and repairs, splice tape with 3-foot overlap connected with duct tape. Supply the District with one full roll for future repairs. Extend to grade of each manhole and at pump stations.

D. Thrust Protection: Provide thrust protection at all bends in forcemains in accordance with Standards and as approved by the District.

E. Terminus: Forcemains shall terminate in manholes prior to connecting to District owned sewer mains.

3.03 UTILITIES TO BE ABANDONED: Close open ends of abandoned underground utilities that are not indicated to be removed. Provide sufficiently strong closures, such as caps or brick and mortar, acceptable to the District to withstand hydrostatic or earth pressure that may result after ends of abandoned utilities have been closed. CONTRACTOR may remove abandoned utilities with written permission of the District or Town.

3.04 INSULATION:

A. Install as shown on approved Drawings.

B. Provide 2-inch minimum thickness for sewer, forcemain, and water main, compacted sand layers directly above and below insulation.

3.05 TESTING OF SANITARY SEWERS:

A. General: Test all sanitary sewer pipes after backfilling. Install all house service leads on main line before testing. Perform tests in presence of the District. A maximum of 1000 feet of pipe may be installed but not tested at any time.

B. Gravity Sewer Leakage Tests: Use low pressure air test as follows:

1. Plug ends of section to be tested.

2. Supply air slowly to the pipe to be tested until the air pressure inside the pipe is 4.0 psi greater than the average back pressure of any groundwater submerging the pipe.

3. Disconnect air supply and allow a minimum of two minutes for stabilization of pressure.

4. Following stabilization period measure drop in pressure over the test period within the following times:

Nominal Pipe Size (in.)	Test Period (min.)
4	4
6	4
8	6
10	6
12	7
15	8

18	9
21	11
24	13

5. Acceptable drop: No more than 1.0 psi.

C. Forcemain and Pressure Sewer Tests: Use hydrostatic test as follows:

1. Fill section of pipe with water and expel all air.

2. Pressurize to 1.5 times the normal operating pressure but not less than 60 psi.

3. Measure leakage over a 2-hour test period.

4. Acceptable leakage: Less than 10 gallons per day per inch diameter per mile of pipe tested.

D. Deflection Test for PVC Gravity Sewer Pipe: Test 100% of pipe with "GO-NO-GO" gauge allowing maximum deflection per ASTM D3034, Appendix X1, Table X1.1.

E. TV Inspection: All sewers and drains shall be inspected by an approved CONTRACTOR using TV pipe inspection. Defects in materials and/or workmanship found during the inspection shall be corrected by the CONTRACTOR.

F. Repair and/or replace all pipes not passing tests, using materials and methods approved by the District, and retest.

2. MANHOLES/PRECAST CONCRETE STRUCTURES

PART 1 - GENERAL

1.01 This section defines the standards associated with the following:

1. Precast Manholes
2. Drop Manholes
3. Precast Wet Well and Valve Pit
4. Catch Basins
5. Inverts
6. Risers
7. Frames, Covers, and Grates

1.02 RELATED WORK:

1.03 QUALITY ASSURANCE:

A. General: Provide complete manhole and precast concrete structures capable of supporting AASHTO H20 loading. All precast concrete shall comply with ASTM C913 "Standard Specification for Precast Concrete Water and Wastewater Structures."

B. Precast Manhole and Catch Basin Components: Comply with ASTM C478.

C. Antifloatation Slab Design Certificate: The CONTRACTOR may provide the precast structures requiring antifloatation slabs as one complete unit. If provided as a monolithic unit, submit a certificate of design signed by a Professional Engineer registered in the State of Maine, certifying that the structure including the slab has been designed to withstand all forces including soil, traffic and hydrostatic in accordance with all applicable laws, regulations, rules and codes.

1.04 SUBMITTALS:

A. Shop Drawings: Submit for precast manholes and all precast concrete items. Show components to be used, elevations of top of precast sections, base and pipe inverts, location of pipe penetrations, steps, for each manhole. Verify finish grade elevation at each proposed manhole location in the field.

B. Product Data: Submit manufacturers' product data and installation instructions for frames, covers, grates, precast items, manhole sleeves, joint sealants, and frost barrier.

PART 2 - PRODUCTS

2.01 MANHOLES (INCLUDES WET WELL):

A. Base Sections: Precast monolithic construction with steps (no steps in wet well).

B. Barrel Sections: Precast with steps (no steps in wet well).

C. Top Sections: Precast eccentric cone with steps. Use flat cover for wet well, if shown on Drawings or approved by the District.

D. Steps: Polypropylene reinforced with steel rod. Meet OSHA requirements, minimum width 16". Cast into concrete.

E. Pipe to Manhole Connections:

1. Pipe diameter 6" or larger: Flexible manhole sleeves shall be CP series manufactured by Interpace Corp., or approved equal. Size to fit diameter and type of pipe without use of gaskets.

2. Pipe diameter less than 6": Thermoplastic pipe sleeve shall be Link-Seal Century Line Model CS100 by Thunderline Corp. with sleeve seal equal to "Link-Seal" by Thunderline Corp., or approved equal.

F. Joints Between Precast Sections: Watertight, shiplap-type seal with two rings of one-inch diameter butyl rubber sealant.

2.02 DROP AND VALVE MANHOLES:

A. General: Conform to requirements for manholes. Provide pipe and accessories as shown on Drawings.

B. Riser Support Bracket: 10 gauge, Type 304, No. 3 finish stainless steel.

2.03 CATCH BASINS:

A. Base Sections: Precast monolithic construction.

B. Barrel Sections: Precast monolithic construction.

C. Top Sections: Precast eccentric cone. Use flat cover for wet well, if shown on Drawings or approved by the District.

D. Joints Between Precast Sections: Watertight, shiplap-type seal with two rings of one-inch diameter butyl rubber sealant.

2.04 INVERTS:

A. 180 Degree Straight Through Manholes: One piece molded fiberglass invert with integral pipe connections that are factory precast integral with the manhole base, "Fiberliner 2000 Invert System" as manufactured by Fiberliner 2000 New England, Inc, Tel. (508) 349-7401; or approved equal.

B. Non Straight Through Manholes: One-piece plastic composite invert, "Reliner" as manufactured by Reliner – Duran, Inc. Tel. (860) 434-0277; or approved equal. Provide concrete backfill with brick table.

1. Concrete: 3000 psi..

2. Sewer Brick: ASTM C32, Grade SS, hard brick.

3. Mortar: Type M, ASTM C270. Use Type II portland cement, Type S lime. Proportions for Mortar: 1 part portland cement, 1/4 part hydrated lime, 3 to 3 3/4 parts sand.

2.05 RISERS:

A. General: Rubber riser rings are preferred.

1. Rubber adjustment riser rings manufactured from a rubber fibrepolyurethane prepolymer composite, "Infra-Riser" as manufactured by GNR Technologies Inc., Tel. (514) 366-6116; or approved equal.

2. No more than 3 courses of brick may be used. Any work must be acceptable to the District.

2.06 FRAMES, COVERS, AND GRATES:

A. Material: Cast iron, ASTM A48 Class 30.

B. Manhole Frames and Covers: For manholes 6' or more in vertical height, use minimum 24" diameter opening. For manholes 6' or less in vertical height , use a min. 28" diameter opening. Weight of 350 pounds, labeled with "SEWER" in 3" high raised letters on cover for sewer manholes. Standard frames and covers shall be Model M267S by Etheridge Foundry, or approved equal.

C. Hatches: Hatches shall be equipped with heavy forged brass hinges, stainless steel hinge pins, spring operators, automatic hold open arm with release handle,

1/4" diamond plate cover and locking mechanism. Single leaf with grab bar Bilco Type J and double leaf with grab bar Bilco Type JD, or approved equal. Sizes as indicated on Drawings as approved by the District.

2.07 FLOOR BOXES: Floor boxes to be cast-in-place. Floor boxes to be constructed of cast iron with bronze bushings to preserve stem alignment, Clow Model F-5695, or approved equal.

2.08 MISCELLANEOUS:

A. Manhole Cover Lifting Tools: Provide two (2) cover lift lifting tools by Etheridge Foundry, or approved equal, compatible with manhole covers provided.

B. Frost Barrier: U.V. resistant, high grade polyethylene, minimum thickness six (6) mils.

C. Joint Sealants:

1. Butyl Rubber Sealant: One (1) inch diameter strips manufactured by Kent Seal, or approved equal.

2. Butyl Rubber Caulking: Conform to AASHTO M-198, Type B.

D. Sewer Manhole Inverts: Provide inverts as specified or as shown. Configuration to be as required by connecting pipes and as shown on Drawings.

PART 3 - EXECUTION:

3.01 INSTALLATION OF MANHOLES/PRECAST STRUCTURES:

A. Placement: Place precast bases and structures on compacted bedding material so bottom of structure is plumb and pipe inverts are at proper elevations. Place manhole barrel and top sections in the appropriate height combinations. Plug all lifting holes inside and out with non-shrink grout. Construct manhole inverts in accordance with specifications.

B. Joints: Follow manufacturers instructions for sealing joints between precast sections. Provide two rings of 1 inch diameter butyl rubber sealant. Point joints inside and out with butyl caulk.

C. Frame and Covers:

1. Set to final grade as shown on the Drawings and as specified. Provide adequate temporary covers to prevent accidental entry until final placement of frame and cover is made.

2. Use two rings of 1 inch diameter butyl rubber sealant between frame and rubber riser. Provide downward force to frame so as to compress the joint, provide a watertight seal, and prevent future settlement. Point compressed joint with butyl rubber caulk sealant.

3. Set manhole frames and covers to final grade only after pavement base course has been applied, or after final grading of gravel roads.

D. Inverts: As specified.

E. Steps: Replace any steps that are out of plumb and proper horizontal placement.

F. Frost Barriers: Wrap each manhole to the maximum excavation depth or not less than 6 feet below grade, with a minimum of four layers of 6 mils each of the polyethylene.

1. Clean manhole exterior of all dirt and remove any protrusions.

2. Apply a 6-inch wide vertical strip of bituminous waterproofing adhesive from the top of manhole to the greatest excavation depth, but not in excess of 6 feet.

3. Start poly wrap at adhesive strip and proceed around manhole continuously, overlapping adhesive strip a minimum of 24 inches on the final layer.

4. Tuck and pleat poly at top in a continuous manner, minimizing size of folds. Extend poly past top of manhole frame and temporarily tuck remainder inside frame, until final backfill and paving.

5. Paved areas: Cut poly flush with manhole rim after pavement is in place.

6. Unpaved areas: Pull loose ends of poly together, remove excess air and tie off end with galvanized wire. Bury with manhole below grade.

3.02 LEAKAGE TESTING - MANHOLES:

A. General: Tests must be observed by the District. Manholes must be complete, including backfill, for final test acceptance except for shelf and invert. Plug all pipes and other openings in the manhole walls prior to test.

B. Exfiltration Test:

1. Plug pipes into and out of MH and secure plugs.

2. Lower groundwater table (GWT) to below MH. Maintain GWT at this level throughout test. Provide means of determining GWT level at any time throughout test.

3. Fill MH with water to top of cone.

4. Allow a period of time for absorption (determined by CONTRACTOR).

5. Refill to top of cone.

6. Determine volume of leakage in an 8 hour (min) test period and calculate rate.

7. Acceptable leakage rate: Not more than 1 gallon per vertical foot per 24 hours.

8. The District reserves the right to require an infiltration test if the District is not satisfied with the exfiltration test.

C. Vacuum Test:

1. Manholes may be vacuum tested in lieu of the exfiltration test. The vacuumtests must be performed prior to backfilling the manhole, filling joints, and constructing the manhole inverts and benches. All pipe connections shall be made prior to the test.

2. Plug pipe openings and securely brace the plugs and pipe.

3. Set the tester onto the top section of the manhole and inflate the compression band to effect a seal between the structure and the vacuum base.

4. Connect the vacuum pump to the outlet port, open the valve, start the motor and draw a vacuum of 10" mercury.

5. Close the valve and monitor the vacuum gauge.

6. The test shall pass if the vacuum holds at 10" mercury or drops no lower than 9" within the following times:

Depth of Manhole (feet)	Time (min.)
0 - 10	3.0
10 - 15	3.5
15 - 20	4.0
20 - 25	4.5
>25	5.0

7. If the vacuum drops in excess of the prescribed rate, the CONTRACTOR shall locate the leak, make proper repairs, and retest the manhole.

8. If the unit fails the test after repair, the unit shall be water exfiltration tested.

3.03 REPAIRS:

A. Determine causes of all leaks and repair them. Perform earthwork required if manhole has been backfilled.

B. Perform repairs using methods and materials approved by the District. Remove and replace or reconstruct manhole if necessary. Remove and replace defective sections if required by the District.

3. SUBMERSIBLE PUMP STATION

This specification is to be used by Consulting Engineers who are specifying submersible pump stations to be owned and/or operated by the Portland Water District (PWD). Certain items herein need to be specified by the Consulting Engineer. Special circumstance may require deviations from this specification; these should be discussed with the PWD Engineering Department (207-774-5961).

PART 1 – GENERAL

1.01 PUMP STATION DESIGN REFERENCES:

A. Submersible Pump Station Description (This Document)

B. Generic Wastewater Pump Station Control Panel Drawing

C. Pump Station Electric Layout Drawings (3 drawings)

D. Telemetry Panel Bill of Materials (To be supplied upon request)

E. General Electrical Specifications

1.02 DESCRIPTION OF WORK: Furnish, install and test submersible wastewater pump station(s) as specified herein and shown on the Drawings, including:

A. Pre-cast concrete wet well

B. Pre-cast concrete valve manhole

C. Pumps and motors

D. Slide-away coupling, base and rail system

E. Piping and valves

F. Electrical, controls, and alarms

G. Miscellaneous components

1.03 SUBMITTALS:

A. Submit five (5) copies of all submittals. The Consulting Engineer shall also review all submittals for compliance with this specification and be responsible for final approval of the submittals. Submittals shall include the following:

1. Complete layout drawings illustrating all construction details, dimensions and elevations, plus any manufacturer instructions on installation and/or handling.

2. List of materials, shop drawings, manufactures literature, operating instructions and maintenance data necessary to determine the structures, materials and equipment to be supplied by the CONTRACTOR meet the requirements of this specification.

3. Pump manufacturer's performance curves showing total head, power and efficiency over the specified capacity range of each pump.

4. Submit calculations demonstrating that the pump station and valve pit have a factor of safety of at least 1.15 against flotation assuming the groundwater level is at finish grade and the structures are empty.

5. Complete layout and schematic drawings of the electrical and instrumentation system. Drawings shall show all devices, wiring, terminal blocks, wire numbers, terminal block numbers, etc. Drawings shall clearly show all connections to existing wiring and instrumentation that shall remain as part of the final product.

6. The pump station manufacturer shall combine all the above information into a common submittal package.

1.04 QUALITY ASSURANCE:

A. Qualification of the manufacturer: Minimum of 5 years experience in the design and manufacturer of submersible pump stations for wastewater. One manufacturer shall provide all structures, equipment and appurtenances, regardless of their original manufacturer. The CONTRACTOR shall be responsible for the satisfactory operation of the entire system.

1.05 GUARANTEE:

A. The CONTRACTOR shall guarantee for one year from substantial completion that the pump station, including the structure and all its equipment will be free from defects in materials and workmanship.

B. The CONTRACTOR shall obtain a 5 year warranty from the access hatch manufacturer, in the name of the Portland Water District, against defects in materials and workmanship, covering parts and labor.

1.06 TOOLS AND ACCESSORIES:

A. The CONTRACTOR shall furnish any specialty tools required to adjust, operate, maintain and repair the equipment. Any such tool shall be delivered prior to the acceptance of the pump station.

1.07 SUBSTITUTIONS:

A. All materials shall be supplied by the manufacturer(s) listed unless the statement "or equal" is specifically used for that item. All substitutions shall be clearly identified in the CONTRACTOR's submittals. The OWNER shall reserves the right to reject any substitution it considers not to be equal to that specified herein.

PART 2 – PRODUCTS

2.01 PRECAST CONCRETE ENCLOSURES:

A. The wet well and valve pit shall be designed and fabricated:

1. To the dimensions shown on the contract drawings or as modified and approved by the Owner during the submittal process.

2. To withstand all dead and live loads, and to the requirements of ASTM C478.

3. For HS-20 wheel loading.

4. To resist buoyant forces.

B. Concrete Requirements

1. Cement shall be Portland Cement conforming to ASTM C-150.

2. Min. 28 day compressive strength of concrete 4000 psi.
3. Reinforcing steel min. yield stress 40,000 psi.
4. Min. concrete cover 1".
5. Min. cement content 564 lbs. per cubic yard.
6. Entrained air 4.5% +/- 1%.

C. Concrete Testing: The pump station manufacturer shall collect test cylinders from the same concrete batch used to manufacturer the components supplied for this project. Test cylinders shall be cured in the same manner as the actual components. Test cylinders shall be tested at 7 days and 28 days. The test results shall be sent to the OWNER.

D. Horizontal Joints: Shiplay type, sealed with two 1" butyl rubber sealant strips.

E. Exterior Waterproofing: Waterproof all exterior below grade surfaces with HLM 1300S by Sonneborn or equal; 55 mils thick. Waterproofing is to be field applied to a dry surface under manufacturers recommended ambient conditions.

F. Interior Coating: Coat interior of pump station wet well and standby tank with coal tar epoxy; 3 coats with total dry film thickness not less than 15 mils.)

2.02 SEWAGE PUMPS:

A. Pumps: For each pump station provide two submersible, non-clog, horizontal discharge, wastewater pumps as specified herein and capable of handling a 3" solid. Pumps shall be designed to pump raw, unscreened wastewater. The pumps shall be designed to operate in a lead-lag sequence.

B. Size: Each pump shall meet the design flow conditions.

C. Materials: the volute, seal plates, impeller and motor housing shall be constructed from ASTM A-48 class 30 cast iron. Pumps shall be painted with water based air dry enamel of 2.0 mil minimum thickness. All exposed hardware shall be 300 series stainless steel. All gaskets shall be compression square ring type.

D. Impeller: The impellers shall be of the non-clog design with pump out vanes on the backside. The impeller shall be dynamically balanced to ISO G6.3 specifications. The impeller shall be trimmed to meet specific performance characteristics prior to balancing.

E. Seal: Pump shall have a double mechanical seal of the single spring design operating in an oil-filled seal cavity. A moisture sensor detection system shall be integrated as standard within the oil-filled cavity, with appropriate alarming provided. Seal faces shall be carbon for the rotating face and ceramic for the stationary face.

F. Slide-away coupling, base and rail system: Discharge base shall be supplied by the pump manufacturer and designed to support the total weight of the pump. Slide away coupling shall be an integral part of the mechanism and shall be so constructed that, when lowered onto the discharge base, the knife action of the vertical metal to metal seal provides a self-sealing, non-clogging unit. It shall have guides for ease of raising and lowering on stainless steel rails. The base shall be bolted directly to the floor. The vertical flanged elbow shall be 125 lb. ANSI standard.

G. Motors: The motor's rotor and stator assembly shall be of the standard frame design and secured to the pump seal plate by threaded fasteners allowing for

easy serviceability. The motor shall be constructed with the windings operating in a sealed housing that contains clean dielectric oil for heat dissipation making it capable of operating in a totally, partially or non-submerged condition for extended periods of time without damage due to the heat generated. Protection against excessive temperature shall be provided by a heat sensor thermostat attached to the starter windings and connected in series with the automatic starting circuit in the control panel.

H. Shaft: The pump/motor shaft shall be of 416 stainless steel.

I. Tests: Each unit shall be given a factory certified test. A copy of the test results shall be supplied to the Portland Water District prior to equipment start-up.

2.03 PIPING AND VALVES

A. Ductile Iron Pipe:

1. Pipe: AWWA C151, class 53, size as shown on the Drawings.
2. Flanged fittings, gaskets, bolts & nuts: AWWA C110, fittings shall be cast iron, 175 psi pressure rating; gaskets shall be full faced.
3. Mechanical joint fittings: AWWA C110, AWWA C11, cast iron, 250 psi pressure rating.

B. Check Valves: Equal to Clow sized as shown on Drawings. Iron body, bronze mounted, outside lever and weight, ANSI #125 flanges.

C. Gate Valves shall be resilient seated gate valves meeting the latest AWWA C-509 standard.

1. Valve shall have a smooth unobstructed water way, be rated for zero leak rate at 200 psi differential working pressure and have a 400 psi hydrostatic test for structural integrity.
2. Valve disc or wedge shall be constructed of ductile iron (less guiding mechanism) and be fully encapsulated and permanently bonded with a resilient elastomer.
3. The internal and external valve body, including the stuffing box, bonnet and interior of the wedge shall be epoxy coated with 8 mils D.F.T. Interior shall meet latest version of AWWA C-550.
4. Valve shall open left.
5. Valve shall be one of the following: U.S.P. Metroseal, Waterous Series 500 (AFC), Muller A-2360 or Clow F6100 Series.

D. Bolts & Nuts: Hex head, UNC, Type 304 stainless steel.

E. Hangers and Supports:

1. For ductile iron pipe: Supports: 4" adjustable, cast iron saddle, lock nut nipple and reducer, assembled; equal to ITT Grinnel Fig. 264. Hangers: ½" galvanized hanger rods, threaded both ends; welded steel wall bracket equal to ITT Grinnel Fig. 195; adjustable clevis equal to ITT Grinnel Fig. 260.

F. Miscellaneous

1. Pipe Sleeves: Hot dipped galvanized steel pipe sleeves with waterstop collars as manufactured by Thunderline Corp.; "Link-Seal" compatible.

2. Link Seal: Mechanical type rubber seal with stainless steel bolts and units as manufactured by Thunderline Corp.

3. Manhole Boot: Flexible manhole sleeve equal to CP series manufactured by Interpace Corp. sized to fit diameter and type of pipe without the use of gaskets.

2.04 MISCELLANEOUS COMPONENTS

A. Valve Manhole and Pump Station Access Hatches: Double door access cover by Bilco, or equal. Door leaf shall be ¼" aluminum diamond pattern plate to withstand 150 pounds per square foot. Doors shall be equipped with heavy forged brass hinges, stainless steel hinge pins, automatic hold open arm with release handle and have a recessed hasp covered by a hinged lid flush with the hatch surface designed to allow the door to be secured by a padlock. Sizes as shown on drawings. Warranty period shall be no less than five years.

B. Stainless Steel Chains: For removing pumps from wet well; size 3/8 inch minimum.

C. Davit Arm Base Plate: Provide and install davit arm base plate(s) as shown on the drawings. The base plate shall be by DB Industries and designed to be compatible with a model L1830, DB Industries davit arm and meet the following requirements:

1. Rated working load: 350 pounds

2. Base height: 15.75 inches; base width: 12 inches by 12 inches

3. Zinc plated steel construction

2.05 FINISHES

A. General: Prepare surfaces and apply finishes as recommended by finish manufacturer. Paint shall be as manufactured by Tnemec Company or equal. All surfaces shall be coated with the type of paint indicated below and applied at the dry film thickness (DFT) in mils per coat as noted:

1. Metal (excluding galvanized and stainless steel):

a. Prime – Polyamide epoxy primer, No. 66-1211 hi-build epoxoline by Tnemec or equal (3 mils DFT).

b. First coat – Polyamide epoxy, No. 66 series hi-build epoxoline by Tnemec or equal (5 mils DFT).

c. Second coat – Polyamide epoxy, No. 66 series hi-build epoxoline by Tnemec or equal (5 mils DFT).

2.06 ELECTRICAL POWER AND CONTROL SYSTEM:

A. General:

1. Provide complete electrical power and control system to the weather head on utility pole. Electrical power shall be a minimum of 110 volt, single phase, 60 Hertz, **the power requirements shall be determined by the ENGINEER**. The electrical system shall include supplying, installing and testing the utility pole (if required by CMP), wiring, electrical meter, disconnects, control devices, conduit and appurtenances to make a fully functional system. Additional details are provided herein and on the Drawings.

2. Supply all materials, devices and equipment in conformance with:

a. Underwriter's Laboratory, Inc.

b. National Electric Manufacturers Association

c. American National Standards Institute

d. National Electric Code

e. Local Power Company

3. Supply and install conduit, wiring and weather head on the utility pole. Supply and install an electrical meter per Central Maine Power's (CMP) requirements. The CONTRACTOR is responsible for coordinating its activities with CMP.

4. The Power panel shall be contained in an exterior enclosure with a solid door(s). Fasten all electrical components to removable sub-plates with screws and lock washers. Tap sub-plates to accept screws. Do not use self-tapping screws. The main control panel shall be provided with a 100 watt, incandescent light, light switch and a utility receptacle that shall remain accessible and functional whether or not the inner door is open.

5. The Control panel shall be constructed following the Generic Wastewater Control Panel drawings and the Instrumentation Specifications.

6. General Control Description: The control system shall allow the pumps to be operated in either manual or automatic modes. The control loop for each pump shall incorporate a hand-off-auto switch, on-off and lead-lag control using an ultrasonic level indicator and a Programmable Logic Controller (PLC), time delay relay and motor overload relay. Alarms and pump status shall be displayed on the interior door of the control panel and transmitted via telemetry to the Portland Water District's Douglass Street facility as described below. The following items shall be mounted on the inner door of the main control panel (please refer to the Generic Wastewater Control Panel drawings for the complete details):

Pump 1 H-O-A switch	Pump 2 H-O-A switch
Pump 1 over-load reset button	Pump 2 over-load reset button
Pump 1 Run Light (green)	Pump 2 Run Light (green)
Pump 1 Seal Alarm (red)	Pump 2 Seal Alarm (red)
Pump 1 Overload (red)	Pump 2 Overload (red)
Pump 1 Temp Alarm (red)	Pump 2 Temp Alarm (red)
High-high wet well light (red)	110 volt GFI receptacle
Hydro-Ranger programmer	

7. Pump run status, motor overload, high motor temperature and pump seal leak alarm lights shall be displayed on the Control Panel swing-out panel, and grouped by the pump. Each of these alarms will be sent individually to the telemetry panel.

B. Components in wet well: Comply with National Electric Code requirements for Class I, Group D, Division 1 locations.

C. Enclosures:

1. At minimum, the control panel, telemetry panel and miscellaneous electrical devices shall be mounted on a sheet of marine plywood

attached to pressure treated 6" x 6" wooden posts. The plywood sheet shall be braced with pressure treated 2" x 4"s or unistrut suitable for exterior use. Additional details are provided on the drawings. For residential areas, it is strongly recommended to enclose the above equipment in a 10'x12' building set on a concrete pad.

2. The telemetry panel enclosure shall be 16"x30"x36" for all applications, and it will be constructed of factory painted metal with a NEMA 4 rating (ref: Telemetry Panel Bill of Materials for details).

3. The Control Panel enclosures, within 1000 feet of salt water (mean high tide line), shall be:

   a. Exterior Enclosures: NEMA Type 3R, 4 or 4X, materials of construction shall be stainless steel with stainless steel hardware. Enclosures shall be lockable with a padlock. The telemetry panel will have a door stop kit that will have an easy disengagement to allow full swing of the door. Enclosures shall have a built in pocket for storing the panel's as-built wiring diagram.

   b. Interior Enclosure: NEMA Type 4X or 12, materials of construction shall be stainless steel or fiberglass with stainless steel hardware. Enclosures shall have a built in pocket for storing the panel's as-built wiring diagram.

4. The Power Panel at all other locations:

   a. Exterior Enclosures: NEMA Type 3R, 4 or 4X, materials of construction shall be steel with stainless steel hardware. Enclosures shall be factory painted to ensure rust resistance. The telemetry panel will have a door stop kit that will have an easy disengagement to allow full swing of the door. Enclosures shall be lockable with a padlock. Enclosures shall have a built in pocket for storing the panel's as-built wiring diagram.

   b. Interior Enclosures: NEMA Type 4, 4X or 12, materials of construction shall be steel or non-metallic with stainless steel hardware. Enclosures shall be factory painted to ensure rust resistance. Enclosures shall have a built in pocket for storing the panel's as-built wiring diagram.

5. No electrical devices or terminal blocks within the enclosures shall be located within 18" of the ground or concrete pad.

D. Main Disconnect Switch: Disconnect switches shall be heavy duty and be designed to accept a padalock as manufactured by Square D, or equal. Main disconnect switch may be incorporated as part of the main circuit breaker

E. Main Circuit Breakers: Normal duty molded case, bolt in type, interrupting capacity 10,000 amperes RMS symmetrical at 120/240 volts, manufactured by General Electric, Westinghouse or Square-D. Minimum size: 100 Amps.

F. Surge Suppressor: Provide protection from lightning and electrical surges. Surge suppressor shall have a peak surge current rating of be 80,000 amps per phase and include auxiliary dry contacts. The surge suppressor shall be The Protector, P-Plus model as manufactured by Innovative Technology, Inc of Brooksville, Florida or approved equal.

   1. Single Phase: Model P1S120/240+C.

   2. Three Phase: Model P3Y120/208+C.

G. Emergency Power Outlet: 600 volt, 100 amp, manufactured by Killarc, model number WRWJS-1004, no substitutes.

H. Manual Transfer Switch: Industrial duty as manufactured by Square-D or approved equal.

I. Control Power:

1. Control Power Transformer: Industrial duty as manufactured by Cutler-Hammer or approved equal.

2. Distribution Panel: Provide separate 100 amp circuit breaker if main circuit breaker is larger than 100 amps.

3. Circuit breakers: Shall be as manufactured by General Electric or equal, normal duty molded case, bolt in type, interrupting capacity of 10,000 amperes RMS symmetrical at 120/240 volts.

J. Motor Branch Components & Motor Control Circuit:

1. General: Provide highest quality industrial components. Provide separate circuit protection, motor starter, and overload relay for each pump. Motor starter overload relay shall have auxiliary N.O. contract (closed on tripping) to activate "Motor Overload" alarm. Provide a motor winding over temperature thermostat in the motor which shall activate a "High Temperature" alarm. The pump seal leak detector shall activate a "Seal Leak" alarm.

2. Circuit Protection: Heavy duty circuit breaker, interrupting capacity 10,000 amperes at 240 volts, sealed by manufacturer after calibration. Provide padlocking operating mechanism for each breaker. Label circuit breakers to indicate circuit protected.

3. Motor Starters: NEMA rated, size 1 or above magnetic, open frame, contacts shall be replaceable without removing starter from mounted position, provide under-voltage release and overload protection on all three phases; provide capacity for addition at least 2 auxiliary contacts. Overload relays shall have visual trip indication and manual reset. All starters shall be Square D, Allen Bradley, Westinghouse, or approved equal.

4. Overload Thermal Units: Shall be supplied by the motor starter manufacturer and sized for the pumps specified herein.

5. Overload reset buttons shall be mounted on the face of the interior control panel to allow operators to rest the overloads without opening the panel door.

6. Circuit Breakers for Controls and Miscellaneous 120 volt Items: Shall be as manufactured by General Electric or equal, normal duty molded case, bolt in type, interrupting capacity of 10,000 amperes RMS symmetrical at 120 volts.

7. Ground Fault Interrupt Circuit Breakers shall be UL listed Class A.

8. All circuit breakers shall be labeled to indicate circuit protected.

9. Hand-Off-Auto Selector Switches: 3-way selector switches, industrial grade, oil tight construction, equal to Allen-Bradley, or approved equal, 300 volt rated. When a selector switch is in the hand mode the pump shall be energized regardless of wet well level, when in the auto mode the pumps on and off depending on wet well level, based upon the control system.

10. Time Delay Relay: Electro Mechanical Design, contacts rated at 10 amperes minimum at 120 volts. Provide a time delay to prevent both pumps from starting simultaneously, Allen Bradley or approved equal.

11. Push buttons shall be industrial grade, oil tight construction equal to Allen-Bradley or approved equal. Pilot lights shall be 120 volt.

12. Labels for all devices on the front of the telemetry and control panels shall be provided. Labels shall be aluminum or heavy duty plastic legend plates. Legend plates shall be attached to the panel by screws, rivets or be an integral part of the device. Stick on labels are not acceptable. Individual letters shall be at least 0.14" high.

13. Elapsed Time Meter: Provide an industrial grade elapsed time meter (ETM) for each pump. The ETMs shall be flush mounted, 120 volt, water resistant construction, contain at least seven digits capable of recording up to 99,999.99 hours and recording in increments of 0.01 hours. Digits shall be at least 0.14 inches high.

14. Relays shall be industrial grade cube relays as manufactured by Idec, Allen Bradley or equal.

K. Level Control System

1. An ultrasonic level measuring devise shall provide level control, level indication and specified auxiliary alarms. The devise shall be a HydroRanger as manufactured by Milltronics (no substitutes allowed) with an XPS-15 transducer. Please refer to the Generic Wastewater Pump Station Control Panel drawings for the complete wiring details.

2. Provide a single low voltage non-mercury float switch for the high-high wet well level alarm. The float switches shall be housed in an unbreakable steel shell encased in polyurethane. Cable conductors shall be a minimum of #16 AWG. The float switch shall be wired to an intrinsically safe relay. Please refer to the Generic Wastewater Pump Station Control Panel drawings for the complete wiring details.

L. Provide thermostatically controlled heater in the control panel to minimize condensation and insure operation of the electronic/electrical equipment during cold weather. Calculate based on - 30° F ambient. Heater is to be controlled by thermostat built into control panel. Heater shall be designed so as not to damage enclosure or components.

M. Wire & Wiring: Run all wiring outside of the electrical panels in conduits. Run signal and instrument wiring in separate conduits from line voltage wiring.

1. Type: THWN or THHW, 600 volts. Color Codes and Identification:

Control Panel:

a. Line and load circuits, AC or DC power - Black

b. AC control circuit at less than line voltage - Red

c. Equipment grounding conductor - Green

d. Current carrying common - White

e. Hot with circuit breaker open - Orange

Telemetry Panel: (To be supplied upon request)

2. Sizing:

a. Electrical control circuit within panels minimum 14 AWG.

b. 4-20 mA signal wiring and telemetry panel wiring shall be no smaller than 18 AWG.

c. Wiring in conduit minimum 14 AWG; size per voltage drop limitations on control circuit.

d. Motor branch wiring minimum 10 AWG; size per NEC.

3. Provide shielded instrument cable where recommended by manufacturer of signal or instrumentation systems or subsystems.

4. WAGO Brand Terminal blocks for the telemetry panel shall be:

Terminal Strip Specifications

Spec #	Application	WAGO terminal	WAGO end/sep (orange)	WAGO stops	Color
1	Analog Input	280-874	280-373	249-116	grey
2	Analog Outputs	280-874	280-373	249-116	grey
3	Descrete Inputs	281-619	281-341	249-116	grey
4	Descrete Outputs	281-619	281-341	249-116	grey
5	Line AC Power	281-629	281-341	249-116	blue
6	24 VDC Power	281-663	281-335	249-116	red
7	DC Ground	281-664	281-335	249-116	black
8	System Ground	281-657	281-335	249-116	yellow-green
9	Intrinsic Safe Analogs	281-695	209-191	249-116	light grey
10	Intrinsic Safe Discretes	281-695	209-191	249-116	light grey
11	Intrinsic Safe System Ground	281-657	281-335	249-116	yellow-green

5. All of the telemetry wire ends shall be covered with the appropriate WAGO brand wire ferrules. They shall be as follows:

Wire Ferrule Specifications

Spec #	Application	WAGO #	Color
1	12 AWG	216-207	grey
2	14 AWG	216-205	yellow
3	16 AWG	216-204	black
4	18 AWG	216-203	red
5	20 AWG	216-202	grey
6	22 AWG	216-201	white
7	Crimping Tool	206-204	

6. All field and cabinet wires will labeled clearly with either the tagname of the applicable signal, or with an appropriate identifier, using a plastic heat shrink label.

7. Use slotted plastic wire ways within the control panel for routing wires.

8. Bundle all wires not within slotted plastic wire ways. Do not bundle in slotted plastic wire ways.

9. Control wires entering or leaving the control panel shall be attached to a terminal strip. The individual connections on the terminal strip shall be numbered.

10. Identification of conductors: Provide permanently attached wire number 1" from each end of each wire at every termination point. For fully visible wires not more than 4" long, provide one number at midpoint. Provide wire numbers matching terminal strip numbers. Number progressively from left to right or top to bottom. Do not use alphabetical identification.

N. Conduit and Fittings:

1. Rigid conduit: Galvanized steel, provide for general use.

2. Liquid tight flexible metal conduit: Smooth, flexible galvanized steel core with abrasion resistant, liquid tight PVC cover; provide for all connections to motors.

O. Utility receptacles shall be a 110 volt, 20 amp, duplex, GFI receptacles. Receptacles shall be Arrowhart 5735-S.

P. Wet well Junction Box: Provide at least two Class 1, Division 1, Group D rated junction box for installation outside of wet well. Units shall be complete with corrosion resistant terminal strips for making up all connections. During installation and hookup, coat all wire connections with NO-OX to prevent corrosion of contacts by moisture. Label all wires to identify their destination and use.

Q. Standby Generators / Emergency Power: All submersible pump stations that are to be owned and operated by the Portland Water District shall require emergency standby generators with automatic transfer switches. Standard specifications are currently under design. Applicant shall consult with the Portland Water District for design criteria and approval.

2.07 TELEMETRY SYSTEM: (To be supplied upon request)

A. General: The CONTRACTOR shall furnish and install a complete telemetry system as herein specified and shown on the Generic Wastewater Pump Station Control Panel drawings. The pump station telemetry system shall utilize a PLC based radio modem to communicate with the Portland Water District's master wastewater station (see the attached bill of materials).

B. Enclosure: The telemetry shall be housed in the Control Panel enclosure (refer to the Telemetry Panel Bill of Materials for the specific type) to be furnished by the Contractor. Termination of field wiring by the Contractor shall be via the details illustrated in the Generic Wastewater Control Panel drawings.

C. The Contractor will verify the following field contacts to "I" and "O" registers of the PLC :

1. High-high wet well level switch discrete input

2. Power loss relay discrete input

3. All pump Auto switch indicator discrete inputs

4. All pump seal failure discrete inputs

5. All pump overload discrete inputs
6. All pump high temperature switch discrete inputs
7. All pump run status discrete inputs
8. Generator fault discrete input (if required)
9. Transfer switch set to CMP discrete input (if required)
10. Transfer switch set to generator discrete input (if required)
11. Loss of echo from the Milltronics HydroRanger discrete input
12. Remote radio power switch discrete output
13. Wet well level indication analog input

D. The Owner will provide the final PLC program and the services required to include the new pump station in the master telemetry system.

2.08 FACTORY TESTING ASSEMBLY:

A. Test motors, pumps, controls, and electrical panels for proper operation. Make corrections and adjustments prior to shipping pump station.

B. Factory assemble and "match mark" all pre-cast items for ease of installation.

PART 3 – EXECUTION

3.01 INSTALLATION:

A. General: Comply with instructions of pump station manufacturer. Provide five (5) Operation and Maintenance Manuals to OWNER prior to installation of pump stations. As-built electrical drawings may be provided after start-up.

B. Placement: Place pre-cast items as shown on the Drawings so structure is plumb and pipes are at proper elevation. Plug all lifting holes inside and out with non-shrink grout. Pump station manufacturer shall assist CONTRACTOR in assemble of the pump station. CONTRACTOR shall notify OWNER 3 working days in advance of setting the pump station wet well and valve pit.

C. Power Supply: Coordinate installation with power company. Provide complete system from pump station to point of connection to CMP facilities.

3.02 INITIAL STARTUP:

A. Provide at least one factory trained manufacturer's representative for field assembly and start-up of the pump station.

B. The wet well level will be controlled using the HydroRanger auxiliary control contacts and the on-board HydroRanger control logic. When the telemetry system has been started, the PLC control logic will take over the primary level control.

3.03 FIELD TESTING:

A. Process Equipment Tests: Test pump stations for proper operation for a minimum of 3 consecutive days. Each pump must operate for a minimum of two hours during the test. Provide water for tests if adequate wastewater flow is not available. Test the control system for all functions including the operation of lead and lag pumps and alternating of pumps. At start and end of test period operate each pump at the design head and measure and record pumping capacity, motor

speed, and horsepower. Test all functions of the alarm system. Schedule all tests with the OWNER. The OWNER shall have the option to witness all tests.

B. Piping: Test pump lines as force mains.

C. Telemetry System Tests: Coordinate test with the OWNER to verify pump status, alarms and level indication are received at the Control panel.

D. Defects and Adjustments: Correct defects, replace defective equipment, and make adjustments to provide a properly operating system. Repeat tests if required by OWNER.

E. Notify OWNER at least 14 working days prior to tests.

3.04 OPERATOR INSTRUCTION:

A. Provide 2 hours of instruction on the use of the Milltronics HydroRanger and the PanelView display.

3.05 OPERATIONS & MAINTENANCE MANUALS:

A. Provide five (5) sets of operations & maintenance (O&M) manuals containing the following information for all equipment and systems provided by the CONTRACTOR:

1. Manufacture's specifications and cut sheets.
2. Manufacture's operations and maintenance manuals.
3. **As-built** mechanical/civil drawings based on the pump station manufacturer's submittals.
4. **As-built** electrical schematic diagrams showing control logic. This diagram may be based on the pump station manufacturer's submittals.
5. **As-built** instrumentation drawings showing all components, wiring, wiring numbers, terminal blocks, and tie points to existing equipment or wiring. These shall be based on the Generic Wastewater Pump Station Control Panel drawings.

B. Laminate in clear plastic one copy of the as-built electrical schematic diagrams and instrumentation drawings and place these in the interior control panel enclosure.

C. Provide electronic copies (PDF) of all manufactures O&M materials.

D. As-built electrical schematic diagrams and wiring drawings shall be drawn using a CAD program fully compatible with AutoCAD release 14. Provide an electronic copy of each drawing to the Portland Water District.

4. TELEVISION INSPECTION OF SEWER LINES

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK:

A. The CONTRACTOR shall furnish all materials, tools, labor and equipment necessary to visually inspect and document the installed or rehabilitated gravity sewer lines by means of a closed-circuit television system.

1.02 SUBMITTALS

A. The CONTRACTOR shall submit log sheets upon completion of the CCTV inspection that shall include stationing, manhole numbers, findings and other pertinent data. (See documentation below)

B. The CONTRACTOR shall provide three (3) copies of the video inspection tape. The tape shall be clearly labeled with the date of inspection and the segment of sewer line inspected. The tapes shall include any initial or pre-rehabilitation pipeline inspections and the repaired or post-rehabilitation pipeline inspection results.

1.03 PRODUCTS

A. EQUIPMENT:

1. VHS video system shall be used which utilizes 1/2-inch recording tapes and the SLP mode.

2. The television camera used for the inspection shall be one specifically designed and constructed for such inspection. Lighting for the camera shall be suitable to allow a clear picture for the entire periphery of the pipe. The camera shall be operative in 100 percent humidity conditions. The camera, television monitor and other components of the video system shall be capable of producing a minimum 650 line resolution color video picture. Picture quality and definition shall be to the satisfaction of the DISTRICT and, if unsatisfactory, equipment shall be removed and no payment made for the unsatisfactory inspection. The camera head shall be pan-and-tilt type with the ability to rotate 360° to view the entire internal circumference of the pipe. The equipment must continuously indicate time, date, and station on the tape. The operator shall narrate to describe conditions or other services encountered.

1.04 EXECUTION

A. INSPECTION:

1. Manual winches, power winches, TV cable and powered rewinds or other devices that do not obstruct the camera view or interfere with proper documentation of the sewer conditions shall be used to move the camera through the sewer line. The rate of movement through the pipeline shall be no more than 1 ft/sec. If, during the inspection, the television camera shall not pass through the entire manhole section, the CONTRACTOR shall reset up his equipment in a manner so that the inspection can be performed for the opposite manhole. The CONTRACTOR is required to repeat the TV inspection of areas repaired subsequent to the original TV inspection.

2. Whenever non-remote powered and controlled winches are used to pull the television camera through the line, telephones or other suitable means of communication shall be set up between the two winches and the monitor control.

B. DOCUMENTATION:

1. Printed location records shall be kept by the CONTRACTOR that shall clearly show the exact location, in relation to adjacent manholes, of each infiltration point discovered by the television camera. In addition, other

points of significance such as locations of laterals, unusual conditions, collapsed sections, and other discernible features shall be recorded and a copy of such records shall be supplied to the DISTRICT.

2. Video tapes of the entire inspection shall be provided to the DISTRICT upon completion of the inspection. The tape playback shall be at the speed that is recorded. The CONTRACTOR shall be required to have all tapes and necessary playback equipment readily accessible for review by the DISTRICT during the project.

DOCUMENT 00 52 24

AGREEMENT FORM - AIA CONSTRUCTION MANAGEMENT (SINGLE-PRIME CONTRACT)

1.1 SUMMARY

A. Document Includes:
   1. Agreement.

B. Related Documents:
   1. Document 00 72 24 - General Conditions - AIA Construction Management (Single-Prime Contract).
   2. Document 00 73 15 - Supplementary Conditions.

1.2 AGREEMENT

A. AIA Document A133 2009, Standard Form of Agreement between Owner and Construction Manager where the Construction Manager is also the Constructor, forms the basis of Agreement between the Owner and Contractor.

END OF DOCUMENT

DOCUMENT 00 72 24

GENERAL CONDITIONS - AIA CONSTRUCTION MANAGEMENT (SINGLE-PRIME CONTRACT)

1.1 SUMMARY

A. Document Includes:
   1. General Conditions.

B. Related Documents:
   1. Document 00 52 24 - Agreement Form - AIA Construction Management (Single-Prime Contract).
   2. Document 00 73 15 - Supplementary Conditions.

1.2 GENERAL CONDITIONS

A. AIA Document A201 2007 - General Conditions of the Contract for Construction - Fifteenth Edition, is the General Conditions of the Contract.

1.3 SUPPLEMENTARY CONDITIONS

A. Refer to Document 00 73 15 for modifications to General Conditions.

END OF DOCUMENT

DOCUMENT 00 73 15

SUPPLEMENTARY CONDITIONS

1.1 SUMMARY

A. Document Includes:
1. General Conditions.

B. Related Documents:
1. Document 00 52 24 - Agreement Form - AIA Construction Management (Single-Prime Contract).
2. Document 00 72 24 - General Conditions - AIA Construction Management (Single-Prime Contract).

1.2 SUPPLEMENTARY CONDITIONS

A. Refer to Document SUPPLEMENTAL GENERAL CONDITIONS, pages 1-8, attached.

END OF DOCUMENT

SUPPLEMENTAL GENERAL CONDITIONS

GENERAL CONDITIONS:

A. The "General Conditions of the Contract for Construction". Document A-201, Fifteenth Edition, dated 2007, as issued by the American Institute of Architects, 1735 New York Avenue, N.W., Washington, D.C. 20006 (the "General Conditions"); form the General Conditions for this Contract whether bound herein or not. The term "Contractor" as used herein shall have the same meaning as the term "Construction Manager" as used in the Standard Form of Agreement Between Owner and Construction Manager, AIA Document A-133 2009, between the parties hereto.

B. The provisions of the General Conditions shall apply to the work of this Contract, except as modified or supplemented hereinafter in these Supplemental Conditions. Where General Conditions Paragraphs or Subparagraphs are modified in part by these Supplemental Conditions, the portions of the General Conditions which have not been modified shall remain in effect. In the event of discrepancy between the General Conditions and these Supplemental Conditions, these Supplemental Conditions shall prevail.

ARTICLE 1 - GENERAL PROVISIONS:

A. Paragraph 1.1 Basic Definitions: Add the following to Subparagraph 1.1.9:

.1 In the event of conflict or discrepancies among the Contract Documents, the Documents shall be construed according to the following priorities.

a.	Highest Priority	Modifications
b.	Second Priority	Agreement
c.	Third Priority	Addenda - later date to take precedence
d.	Fourth Priority	Supplemental General Conditions
e.	Fifth Priority	General Conditions
f.	Sixth Priority	Special requirements of financing agency published in the Project Manual
g.	Seventh Priority	Division 1 of the Specifications
h..	Eighth Priority	Drawings and Div. 2-16 of the Specifications

.2 In the event of conflicts or discrepancies between the Drawings and Divisions 2-16 of the Specifications or within either document not clarified by Addendum, the Architect will determine which takes precedence in accordance with Section 4.2.11.

.3 The Contract Documents executed in accordance with Section 1.5.1 shall prevail in case of an inconsistency with subsequent versions made through manipulatable electronic operations involving computers.

B. Paragraph 1.1 Basic Definitions: Add the following to Subparagraph 1.1.2:

Except for the special agreements in Paragraph 3.18, nothing contained in the Contract Documents shall be construed to create any contractual relationship of any kind between the Architect and the Contractor.

ARTICLE 2 - OWNER -

Section 2.3: Delete "repeatedly" in line 2.

ARTICLE 3 - CONTRACTOR:

A. Change Subparagraph number 3.18.2 to read "3.18.3".

B. Add the following Subparagraph:

3.18.2 Contractor shall indemnify, defend and hold harmless the Owner from all loss, costs and damages incurred by the Owner as a result of the filing of any mechanics liens relating to the Work, except to the extent such lien relates solely to Owner's failure to make a timely progress payment under the Agreement.

C. Add the following Subparagraphs:

3.2.5 The Contractor shall give the Architect timely notice of any additional design drawings, specifications, or instructions required to define the work in greater detail, in order to permit the proper progress of the work.

3.2.6 The Owner shall be entitled to deduct from the Contract Sum amounts paid to the Architect for the Architect to evaluate and respond to the Contractor's requests for information, where such information was available to the Contractor from a careful study and comparison of the Contract Documents, field conditions, other Owner-provided information, Contractor-prepared coordination drawings, or prior Project correspondence or documentation.

3.2.6 Any necessary changes shall be ordered as provided in Article 7.

D. Paragraph 3.4 Labor and Materials: Add the following Sections and clauses:

3.4.4 Not later than 15 days from the date of the Guaranteed Maximum Price Amendment, the Contractor shall provide a list showing the name of the manufacturer proposed to be used for each of the major products to be used in the work and, where applicable, the name of the installing Subcontractor.

3.4.4 The Architect shall reply in writing within seven (7) days to the Contractor stating whether the Owner or the Architect, after due investigation, has reasonable objection to any such proposal. If adequate data on any proposed manufacturer or installer is not available, the Architect may state that action will be deferred until the Contractor provides further data. Failure to object to a manufacturer shall not constitute a waiver of any of the requirements of the Contract Documents, and all products furnished by the listed manufacturer must conform to such requirements.

.1 After the contract has been executed; the Owner and the Architect will consider a formal request for the substitution of products in place of those specified or considered an 'or equal' per the conditions set forth in the Contract Documents, Section 01001 Basic Requirements.

.2 By making requests for substitutions based on Clause 3.4.4.1 above, the Contractor or Subcontractor:

a. represents that he has personally investigated the proposed substitute products;

b. represents that he will provide the same warranty for the substitution that he would for that specified;

c. certifies that the cost data presented is complete and includes all related costs under this Contract and has separately identified but excluded the Architect's review and redesign costs (to be paid by owner) required to make the substitution, if any.

d. will coordinate the installation of the accepted substitute, making such changes as may be required for the work to be complete in all respects.

C. Section 3.7 Permits, Fees, Notices and Compliance with Laws

In Section 3.7.4 change the time required for notice from 21 days to 5 days.

D. Paragraph 3.9 Superintendent:

Add the following clauses to the end of Section 3.9.1:

.1 The Contractor shall assign one construction superintendent to the project and maintain the same person as superintendent, excepting acts beyond the contractors control, throughout the duration of the Contract.

.2 The Contractor shall not make any changes in project superintendent personnel without prior written approval from the Owner.

3.9.2 The superintendent or assistant to the superintendent shall also perform as a coordinator for mechanical and electrical work. The coordinator shall be knowledgeable in mechanical and electrical systems and capable of reading, interpreting and coordinating Drawings, Specifications, and shop drawings pertaining to such systems. The coordinator shall assist the Subcontractors in arranging space conditions to eliminate interference between the mechanical and electrical systems and other Work and shall supervise the preparation of coordination drawings documenting the spatial arrangements for such systems within restricted spaces. The coordinator shall assist in planning and expediting the proper sequences of delivery of mechanical and electrical equipment to the site. Not withstanding the contractor's obligations under 1.2 CORRELATION AND INTENT OF THE CONTRACT DOCUMENTS, the contract documents are the basis for the creation of the coordination drawings. The Architect is responsible for the fundamental coordination of the contract documents upon which all further coordination is based..

E. Paragraph 3.12 Shop Drawings, Product Data and Samples

Add the following clauses to the end of Section 3.12:

3.12.11 The Architect's review of Contractor's submittals will be limited to examination of an initial submittal and up to one (1) resubmittal. The Architect's review of additional submittals will be made only with the consent of the Owner after notification by the Architect. The Owner shall be entitled to deduct from the Contract Sum amounts paid to the Architect for evaluation of such additional submittals.

ARTICLE 4 - ADMINISTRATION OF THE CONTRACT:

A. Paragraph 4.2 Architect's Administration of the Contract

Add the following clauses to Section 4.2.1

4.2.2.1 The Contractor shall reimburse the Owner for compensation paid to the Architect for additional site visits made necessary by the fault, neglect, or request of the Contractor..

ARTICLE 5 – SUBCONTRACTORS

A. Change the following phase before the words "the Contractor shall require..." in first line of Paragraph 5.3 to read "By appropriate written agreement, the Contractor shall require.... " Change is acceptable but no such para # exists.

ARTICLE 6 - CONSTRUCTION BY OWNER - No modifications.

ARTICLE 7 - CHANGES IN THE WORK:

A. Delete the words "a reasonable allowance for overhead and profit" wherever they occur in Article 7 and substitute "an allowance for overhead and profit in accordance with the schedule set forth in subparagraph 7.1.4.

B. Add the following subparagraphs and clauses:

7.1.4 The allowance for overhead and profit combined, included in the total cost to the Owner, shall be based on the following:

.1 For the combination of the Contractor and all subcontractors, for any Work : 20 percent of the cost of the work excluding any other markups.

.2 Cost to which overhead and profit is to be applied shall be determined in accordance with Section 7.3.6 if not otherwise stipulated in the change document.

.3 In order to facilitate checking for quotations of extras or credits, all proposals, except those so minor that their propriety can be seen by inspection, shall be accompanied by a complete itemization of costs including labor, materials and subcontracts. Labor and materials shall be itemized in the manner prescribed above. Where major cost items are Subcontracts, they shall be itemized also. In no case will a change involving over $1,000.00 be approved without such itemization.

C. Modify the following clause as indicated:

7.2.1 ... and signed by the Owner, Contractor, Architect, and Owner's lenders stating their agreement ...

ARTICLE 8 - TIME:

A. Paragraph 8.3 Delays and Extensions of Time:

8.3.1 Delete the words "labor disputes" from line three.

ARTICLE 9 - PAYMENTS AND COMPLETION

A. Additional Paragraph: Insert additional Paragraphs in their proper locations as follows:

Paragraph 9.8 Substantial Completion: Add the following to the end of Subparagraph 9.8.1:

"and only minor items, which can be corrected or completed without substantial interference with the Owner's use of the Work, remain to be corrected or completed, and a Certificate of Occupancy has been issued by the local code enforcement agency having jurisdiction for the project location."

B. Paragraph 9.10.2: Insert a new item (6) as follows:

"(6) Delivery of As-Built Drawings"

ARTICLE 10 – PROTECTION OF PERSONS AND PROPERTY

A. Paragraph 10.2 Safety of Persons and Property

Add the following clauses to Section 10.2.4:

10.2.4.1 When use or storage of explosives, or other hazardous materials, substances or equipment, or unusual methods are necessary for execution of the Work, the Contractor shall give the Owner reasonable advance notice.

10.2.4.2 If the Contract Documents require the Contractor to handle materials or substances that under certain circumstances may be designated as hazardous, the Contractor shall handle such materials in an appropriate manner.

B. Paragraph 10.3.4 Add the following at the end of the paragraph: "and Contractor has properly handled such materials."

ARTICLE 11 - INSURANCE AND BONDS:

A. Paragraph 11.1 Contractor's Liability Insurance:

11.1.1.1 Delete the semicolon at the end of Section 11.1.1.1 and add:

",including private entities performing Work at the site and exempt from the coverage on account of number of employees of occupation, which entities shall maintain voluntary compensation coverage at the same limits specified for mandatory coverage for duration of the Project."

11.1.1.2 Delete the semicolon at the end of Section 11.1.1.2 and add:

"or persons or entities excluded by statute from the requirements of Section 11.1.1.1 but required by the Contract Documents to provide the insurance required by that section;

B. Add the following lines and clauses to the end of Section 11.1.2:

11.1.2 "...The insurance required by Section 11.1.1 shall be written for not less than the following, or greater if required by law and all such policies excluding Worker's Compensation shall include the Owner as an additional insured and may be satisfied by provision of an umbrella liability policy that covers all items indicated."

.1 Worker's Compensation:

(a) State: Statutory

(b) Applicable Federal Statutory

.2 Employers Liability $500,000

.3 Comprehensive General Liability (including Premises-Operations; Independent Contractors' Protective; Products and Completed Operations; Contractual Liability, Comprehensive Automobile Liability (Bodily Injury/Property Damage), Personal Injury with Employment Exclusion deleted, and Broad Form Property Damage (including coverage for XCU Hazards Liability) shall be as follows:

(a) Bodily Injury/Property Damage:

$5,000,000 Each Occurrence/Accident
$5,000,000 Annual Aggregate

(b) Products and Completed Operations shall be maintained for a minimum period of at least 1 year after either 90 days following Substantial Completion, or final payment, whichever is earlier.

.4 Contractual Liability (including indemnification provisions):

(a) shall include coverage sufficient to meet the obligations in AIA Document A201-2007 under Section 3.18.

.8 Aircraft Liability (owned and non-owned) when applicable: (Owner to approve limits proposed by Contractor.)

.9 Watercraft Liability (owned and non-owned) when applicable: (Owner to approve limits proposed by Contractor).

.10 Contractor shall ensure that all sub and sub-sub contractors shall carry policies with $1,000,000.00 insurance coverage for their work on this project.

C. Add the following clause to Section 11.1.3:

.1 The Contractor shall furnish three (3) copies each of Certificates of Insurance herein required with one copy for Architect's use, which shall specifically set forth evidence of all coverage required herein. The form of the Certificate shall be ACORD form 25 or equivalent, completed and supplemented in accordance with AIA G-715 – 1991 or equivalent. The Contractor shall furnish to the Owner copies of any endorsements that are subsequently issued amending coverage or limits.

D. Paragraph 11.3 Property Insurance.

11.3.1.4 Delete Section 11.3.1.4 and add the following:

11.3.1.4 The Contractor shall at the Contractor's own expense provide insurance coverage for materials stored off site after written approval of the Owner of the value established in the approval, and also for portions of the Work in transit until such materials are permanently attached to the Work.

Add the following clause to Section 11.3.1:

11.3.1.6 The insurance required by Section 11.3 is not intended to cover machinery, tools or equipment owned or rented by the Contractor that are utilized in the performance of the Work but not incorporated into the permanent improvements. The Contractor shall, at the Contractor's own expense, provide insurance coverage for owned or rented machinery, tools or equipment, which shall be subject to the provisions of Section 11.3.7.

E. Paragraph 11.4 Performance Bond and Payment Bond

11.4.1 Delete Section 11.4.1 and substitute the following:

11.4.1 The Contractor shall furnish bonds covering faithful performance of the Contract and payment of obligations arising thereunder. Bonds may be obtained through the Contractor's usual source and the cost thereof shall be included in the Contract Sum. The amount of each bond shall be equal to 100% of the Contract Sum.

11.4.1.1 The Contractor shall deliver the required bonds to the Owner not later than three (3) days following the date the Executed Amendment is entered into, or if the Work is to be commenced prior thereto in response to a letter of intent, the Contractor shall, prior to commencement of the Work, submit evidence satisfactory to the Owner that such bonds will be furnished.

11.4.1.2 The Contractor shall require the attorney in fact who executes the required bonds of behalf of the surety to affix thereto a certified and current copy of the power of attorney.

ARTICLE 13 - MISCELLANEOUS PROVISIONS:

A. Paragraph 13.2 Successors and Assigns:

13.2.1: Add the following at the end of the second sentence: "; provided, however, that consent to an assignment by Owner will not be unreasonably withheld by Contractor."

B. Add the following Paragraph 13.8 to Article 13:

13.8 EQUAL OPPORTUNITY

13.8.1 The Contractor shall maintain polices of employment as follows:

13.8.1.1 The Contractor and the Contractor's Subcontractors shall not discriminate against any employee or applicant for employment because of race, religion, color, sex , national origin or sexual orientation. The Contractor shall take affirmative action to insure that applicants are employed, and that employees are treated during employment without regard to their race, religion, color, sex, national origin or sexual orientation. Such action shall include, but not be limited to, the following employment, upgrading, demotion or transfer, recruitment or recruitment advertising, layoff or termination, rates of pay or other forms of compensation, and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the policies of non-discrimination.

13.8.1.2 The Contractor and the Contractor's Subcontractors shall, in all solicitations or advertisements for employees placed by them or on their behalf, state that all qualified applicants will receive consideration for employment without regard to race, religion, color, sex , national origin or sexual orientation.

ARTICLE 14 - TERMINATION OR SUSPENSION OF THE CONTRACT:

A. Paragraph 14.2 Termination By The Owner For Cause:

14.2.1.1 Delete the words "repeatedly"

14.2.1.3 Delete the word "repeatedly"

ARTICLE 15 – CLAIMS AND DISPUTES - No modifications.

ARTICLE 16 - OTHER CONDITIONS OF THE CONTRACT:

Add the following:

16.1 The Contractor acknowledges that nothing in the performance of the Services of the Architect in connection with the Project implies any undertaking for the benefit of, or which may be enforced by the Contractor, its subcontractors or suppliers, or the surety of any of them, and that the obligations of the Architect run solely to the benefit of the Owner.

16.2 Typographical errors shall not be grounds for additional payments.

16.3 The Architect is not responsible for the survey, identification, or removal of any hazardous materials, including asbestos, on the Project.

16.4 The Contractor is not responsible for the survey, identification, or removal of any hazardous materials, including asbestos, on the Project unless otherwise specified.

16.5 In the event the Contractor encounters material reasonably believed to be asbestos or other hazardous materials which has not been rendered harmless, the Contractor shall immediately stop Work in the area affected and report the condition to the Owner and the Architect in writing. The Work in the affected area shall not thereafter be resumed except by written agreement of the Owner and Contractor if in fact the material is asbestos or other hazardous materials and has not been rendered harmless. The Work in the affected area shall be resumed in the absence of asbestos or other hazardous materials, or when it has been rendered harmless, by written agreement of the Owner and Contractor. The Owner shall be responsible for contracting the removal of asbestos or other hazardous materials.

16.6 The Contractor shall not be required to perform without consent any Work relating to asbestos or other hazardous materials.

16.7 Access to Records

16.7.1 It is also agreed that the following Access to Records provision applies if Section 952 of the Omnibus Reconciliation Act of 1980 is found to apply to this contractual relationship. Until the expiration of four years after the furnishing of the services provided under this Contract, the Contractor will make available to the Secretary, U.S. Comptroller General, and their representatives, this Contract and all books, and documents and records necessary to certify the nature and extent of the costs for those services. If the Contractor carries out the duties of the Contract through a subcontract worth $10,000.00 or more over twelve month period with a related organization, the sub-period will also contain the access clause to permit access by the Secretary, Comptroller General, and their representative to the related organization's books and records.

...END OF SUPPLEMENTAL GENERAL CONDITIONS