#2012-432

357-A-1

1158 Riverside St.

Maintenance Bld.

Riverside Golf Course

CITY OF PORTLAND, MAINE
DEVELOPMENT REVIEW APPLICATION
PLANNING DEPARTMENT PROCESSING FORM

I. D. Number 2012-432

rside Golf Course
cant

8/15/97
Application Date

Riverside St, Portland, ME 04103
cant's Mailing Address

Riverside Golf Course
Project Name/Description

d Grygiel
sultant/Agent

1158 Riverside St
Address of Proposed Site

3524 797-3524
cant or Agent Daytime Telephone, Fax

357-A-001
Assessor's Reference: Chart-Block-Lot

osed Development (check all that apply): ☒ New Building ☐ Building Addition ☐ Change Of Use ☐ Residential
Office ☐ Retail ☐ Manufacturing ☐ Warehouse/Distribution ☐ Parking Lot ☐ Other (specify) Maintenance -Golf

0 Sq Ft
osed Building square Feet or # of Units

Acreage of Site

Zoning

ck Review Required:

Site Plan (major/minor) ☐ Subdivision # of lots ☐ PAD Review ☐ 14-403 Streets Review

Flood Hazard ☐ Shoreland ☐ HistoricPreservation ☐ DEP Local Certification

Zoning Conditional Use (ZBA/PB) ☐ Zoning Variance ☐ Other

s Paid: Site Plan $300.00 Subdivision Engineer Review Date: 8/15/97

Approval Status:

Reviewer Lt. Mc Dougall

Approved ☒ Approved w/Conditions see attached ☐ Denied

pproval Date 9/22/97 Approval Expiration Extension to ☒ Additional Sheets Attached

Condition Compliance Lt. Mc Dougall (signature) 9/22/97 (date)

formance Guarantee ☐ Required* ☐ Not Required

building permit may be issued until a performance guarantee has been submitted as indicated below

Performance Guarantee Accepted	date	amount	expiration date
Inspection Fee Paid	date	amount	
Building Permit Issued	date		
Performance Guarantee Reduced	date	remaining balance	signature
Temporary Certificate of Occupancy	date	☐ Conditions (See Attached)	
Final Inspection	date	signature	
Certificate of Occupancy	date		
Performance Guarantee Released	date	signature	
Defect Guarantee Submitted	submitted date	amount	expiration date
Defect Guarantee Released	date	signature	

19970059
I. D. Number

CITY OF PORTLAND, MAINE
DEVELOPMENT REVIEW APPLICATION
PLANNING DEPARTMENT PROCESSING FORM
ADDENDUM

8/15/97
Application Date

rside Golf Course
cant

Riverside Golf Course
Project Name/Description

Riverside St, Portland, ME 04103
cant's Mailing Address

d Grygiel
sultant/Agent

1158 Riverside St
Address of Proposed Site

3524 797-3524
icant or Agent Daytime Telephone, Fax

357-A-001
Assessor's Reference: Chart-Block-Lot

Fire Conditions for Approval

cant must show a hydrant within 800' path of travel

19970059
I. D. Number

CITY OF PORTLAND, MAINE
DEVELOPMENT REVIEW APPLICATION
PLANNING DEPARTMENT PROCESSING FORM

rside Golf Course
cant

8/15/97
Application Date
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Acreage of Site

Zoning

ck Review Required:

Site Plan (major/minor) ☐ Subdivision # of lots ☐ PAD Review ☐ 14-403 Streets Review

Flood Hazard ☐ Shoreland ☐ HistoricPreservation ☐ DEP Local Certification

Zoning Conditional Use (ZBA/PB) ☐ Zoning Variance ☐ Other

s Paid: Site Plan $300.00 Subdivision Engineer Review Date: 8/15/97

C Approval Status:

Reviewer Jim Wendel

Approved ☐ Approved w/Conditions see attache ☐ Denied

pproval Date 9/18/97 Approval Expiration 9/18/98 Extension to ☐ Additional Sheets Attached

Condition Compliance Jim Wendel (signature) 9/18/97 (date)

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Defect Guarantee Released			

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DEVELOPMENT REVIEW APPLICATION
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Site Plan (major/minor) ☐ Subdivision # of lots ____ ☐ PAD Review ☐ 14-403 Streets Review

Flood Hazard ☐ Shoreland ☐ HistoricPreservation ☐ DEP Local Certification

Zoning Conditional Use (ZBA/PB) ☐ Zoning Variance ☐ Other ____

s Paid: Site Plan $300.00 Subdivision ____ Engineer Review ____ Date 8/15/97

nning Approval Status:

Reviewer Kandi Talbot

Approved ☐ **Approved w/Conditions** See Attached ☐ **Denied**

Approval Date 9/23/97 Approval Expiration 9/23/98 Extension to ____ ☐ Additional Sheets Attached

OK to Issue Building Permit Kandi Talbot (signature) 9/23/97 (date)

rformance Guarantee ☐ **Required*** ☒ **Not Required**

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Performance Guarantee Released	date	signature	
Defect Guarantee Submitted	submitted date	amount	expiration date
Defect Guarantee Released			

Planning & Urban Development

Joseph E. Gray Jr.
Director

CITY OF PORTLAND

September 23, 1997

Riverside Golf Course
1158 Riverside St.
Portland ME 04103
Attn: David Grygiel

Re: 1158 Riverside Street

Dear Sir:

On September 23, 1997, the Portland Planning Authority granted minor site plan approval for a maintenance building located at 1158 Riverside Street.

The approval is based on the submitted site plan. If you need to make any modifications to the approved site plan, you must submit a revised site plan for staff review and approval.

Please note the following provisions and requirements for all site plan approvals:

1. The site plan approval will be deemed to have expired unless work in the development has commenced within one (1) year of the approval or within a time period agreed upon in writing by the City and the applicant. A one year extension may be granted by this department if requested by the applicant in writing prior to the expiration date of the site plan.

2. A performance guarantee in a form acceptable to the City of Portland and an inspection fee equal to 1.7% of the performance guarantee will have to be posted before beginning any site construction or issuance of a building permit.

3. A defect guarantee, consisting of 10% of the performance guarantee, must be posted before the performance guarantee will be released.

4. Prior to construction, a preconstruction meeting shall be held at the project site with the contractor, development review coordinator, Public Work's representative and owner to review the construction schedule and critical aspects of the site work. At that time, the site/building contractor shall provide three (3) copies of a detailed construction schedule to the attending City representatives. It shall be the contractor's responsibility to arrange a mutually agreeable time for the preconstruction meeting.

O:\PLAN\DEVREVW\RIVE1158\APPLTR.LEC

PINKHAM & GREER
CONSULTING ENGINEERS, INC.

170 U.S. Route One
Falmouth, Maine 04105
Tel: 207.781.5242
Fax: 207.781.4245

September 5, 1997
File: 97139

Mr. David Grygiel
RIVERSIDE MUNICIPAL GOLF COURSE
1158 Riverside Street
Portland, ME 04103

RE: WRITTEN STATEMENTS, RIVERSIDE GOLF COURSE MAINTENANCE FACILITIES

Dear David:

After review with you and review of Kandice Talbot's letter of August 22nd, I offer the following for your consideration and submittal to the City. They have been numbered consistent with the City Ordinance attached:

1. The primary use of this site is a golf course with accessory uses. This project is the construction of a maintenance and storage facility for the mowing and maintenance equipment. The location on site is adjacent to the existing parking and maintenance areas. It was selected to minimize earthwork impacts.

2. The site is approximately 175 acres. The maintenance facility is planned at 5,000 square feet or 0.07% of the site.

3. To the best of my knowledge, the golf course is owned by the City and has the normal and customary utility easements.

4. The maintenance facility generates one to two cubic yards of trash per week. It is currently handled by City staff.

5. The site is serviced by the City for sewage and by the Portland Water District for water supply, very little, if any, change is usage will occur.

6. This site is located adjacent to the Presumpscot River. It drains to the river via various ditches, swales, underdrains and pipes. Much of the flow is surface flow.

   The area around the maintenance building drains half towards the golf course and half towards the wetland area to the east. Surface flow from the building and paved area will be spread out around the perimeter of the pavement to create sheet flow conditions. The area around the perimeter will be vegetated with grass or trees to provide some filtering and management.

PINKHAM & GREER
CONSULTING ENGINEERS, INC.

The golf course is immediately adjacent to the river and floods from time to time from upstream flows. Peak flows from this site occur prior to the peak flow of the river and do not impact peak flows in the watershed. No detention is required.

7. Sequence of Construction:

    1. Install all silt fence protection.
    2. Clear and grub work areas. Temporarily seed areas not to be worked on within 14 days.
    3. Strip and stockpile on-site topsoil. Seed stockpiles with temporary seed mix.
    4. Sample topsoil/loam. Adjust lime and fertilizer accordingly.
    5. Begin earthwork for gravel drive areas.
    6. Begin foundation construction.
    7. Rough grade gravel drive areas.
    8. Fine grade gravel drive side slopes and rough grade remainder of construction areas.
    9. Complete foundation and start building construction.
    10. Re-seed or temporarily seed any area which will be left undisturbed for more than 14 days.
    11. Complete fine grading of driveway and walks.
    12. Fine grade, loam seed and fertilize remainder of site.
    13. Remove temporary soil erosion measures.

8. To the best of my knowledge, the State requires a Permit by Rule application for working within 100 feet of the wetland boundary to the east, a building permit and a State Fire Marshal permit is required as part of the building design.

9. The golf course budget will be used to fund the project. Please send a copy to Kandy for her records.

10. If you have a deed to the property, please send a copy to Kandy.

PINKHAM & GREER
CONSULTING ENGINEERS, INC.

11. We are not locating this building near any unusual natural areas or in sensitive wildlife habitat. We will be protecting the adjacent areas by using the erosion control methods shown of the drawings.

    We have added the building siding material notation to the plans. The structure will be sheathed with metal siding.

Hopefully, this addresses the concerns of the City's Planning staff.

Sincerely,

PINKHAM AND GREER

Thomas S. Greer, P.E.

TSG/dp

Enclosure

h. Landscape plan showing location ... d ings, areas of existing vegetation to be preserved, preservation measures to be employed, and details of planting and preservation specifications;

i. Location and dimensions of all fencing and screening;

j. Location and intensity of outdoor lighting system;

k. Location of fire hydrants, existing and proposed;

l. If a site falls within or in proximity to an area shown on the United States Department of the Interior National Wetlands Inventory or within or in proximity to an area indicating hydric soils as shown on the Soil Conservation Service Soil Survey of Cumberland County or shows other evidence of the existence of wetlands as defined by the Natural Resources Protection Act and based on the Federal Manual for Identifying and Delineating Jurisdictional Wetlands, a copy of which is on file in the department of planning and urban development, a delineation of wetlands boundaries prepared by a qualified professional shall be included on the plan or a written statement from a qualified professional that no wetlands exist on the site shall be submitted with the site plan. Development activities requiring written permits from federal or state agencies shall be submitted to the building authority prior to construction;

m. Location of test pits and test borings;

n. Location and details of all temporary and permanent erosion and sedimentation control measures.

(3) In the case of a change of use of an existing building, the planning authority or the board may waive required submissions as to the exterior of the building or to the lot if there are no exterior or outside changes proposed or required.

(c) *Written statements.* All site plans shall be accompanied by a written statement by the applicant that shall set forth the names and addresses of all owners of the parcels proposed to be developed and the estimated cost of the development. The applicant shall also provide written statements containing the following:

(1) A description of the proposed uses to be located on the site, including quantity and type of residential units, if any;

(2) The total land area of the site and the total floor area and ground coverage of each proposed building and structure;

(3) General summary of existing and proposed easements or other burdens now existing or to be placed on the property;

(4) The types and estimated quantities of solid waste to be generated by the development;

(5) Evidence of the availability of off-site facilities including sewer, water and streets;

(6) A narrative describing the existing surface drainage on the site and a stormwater management plan indicating measures which will be taken to control surface water runoff;

(7) A construction plan outlining the anticipated sequence of construction of the major aspects of the proposed project, including without limitation roads, retention basins, sewer lines, seeding and other erosion control measures, and pollution abatement measures, and also setting forth the approximate dates for commencement and completion of the project;

(8) A list of all state and federal regulatory approvals to which the development may be subject, the status of any pending applications, and the anticipated time frame for obtaining such permits or that a determination of no jurisdiction from the agency will be requested;

(9) Evidence of financial and technical capacity to undertake and complete the development including, but not limited to, a letter from a responsible financial institution stating that it has reviewed the planned development and would seriously consider financing it when approved, if requested to do so;

(10) Evidence of the applicant's title, right, or interest in the property, including without limitation deeds, leases, purchase options or any other documentation;

(11) A narrative describing any unusual natural areas, wildlife and fisheries habitats, or archaeological sites located on or near the project site and a description of the methods that will be used to protect such areas or sites.

(d) *Approval or disapproval.* Within ninety (90) days after receipt of a complete final site plan or applicable component plans and accompanying statements for minor development, except a two-family dwelling which is not subject to the provisions of section 14-117(1)a, the planning authority shall approve or disapprove the plan and shall advise the building authority and applicant in writing of its action. The planning authority shall approve or disapprove a plan for a two-family dwelling which is not subject to the provisions of section 14-117(1)a within thirty (30) days of receipt of a complete final site plan or applicable component plans and accompanying statements for minor development. Appeal from a disapproval of or any condition imposed upon such a two-family dwelling by the planning authority shall be taken to the planning board within thirty (30) days of the decision. When a site plan requires approval by the planning board, a public hearing shall be scheduled within ninety (90) days after receipt of a complete site plan, unless such time period is extended in writing by the applicant and the authority. The planning board shall notify the applicant in writing of its approval or disapproval of the project within thirty (30) days after the board's final vote to approve or disapprove the project.

(e) *Approved plan prerequisite to issuance of permits.* No building permit, certificate of occupancy or street opening permit shall be issued until a final site plan, or applicable components thereof, has been approved under this article and a copy of the approved site plan is filed in the office of the building authority and such permit is determined to be consistent with

Planning & Urban Development

Joseph E. Gray Jr.
Director

CITY OF PORTLAND

September 23, 1997

Riverside Golf Course
1158 Riverside St.
Portland ME 04103
Attn: David Grygiel

Re: 1158 Riverside Street

Dear Sir:

On September 23, 1997, the Portland Planning Authority granted minor site plan approval for a maintenance building located at 1158 Riverside Street.

The approval is based on the submitted site plan. If you need to make any modifications to the approved site plan, you must submit a revised site plan for staff review and approval.

Please note the following provisions and requirements for all site plan approvals:

1. The site plan approval will be deemed to have expired unless work in the development has commenced within one (1) year of the approval or within a time period agreed upon in writing by the City and the applicant. A one year extension may be granted by this department if requested by the applicant in writing prior to the expiration date of the site plan.

2. A performance guarantee in a form acceptable to the City of Portland and an inspection fee equal to 1.7% of the performance guarantee will have to be posted before beginning any site construction or issuance of a building permit.

3. A defect guarantee, consisting of 10% of the performance guarantee, must be posted before the performance guarantee will be released.

4. Prior to construction, a preconstruction meeting shall be held at the project site with the contractor, development review coordinator, Public Work's representative and owner to review the construction schedule and critical aspects of the site work. At that time, the site/building contractor shall provide three (3) copies of a detailed construction schedule to the attending City representatives. It shall be the contractor's responsibility to arrange a mutually agreeable time for the preconstruction meeting.

O:\PLAN\DEVREVW\RIVE1158\APPLTR.LEC

19970059
I. D. Number

CITY OF PORTLAND, MAINE
DEVELOPMENT REVIEW APPLICATION
PLANNING DEPARTMENT PROCESSING FORM

Riverside Golf Course
Applicant

8/15/97
Application Date

1158 Riverside St, Portland, ME 04103
Applicant's Mailing Address

Riverside Golf Course
Project Name/Description

David Grygiel
Consultant/Agent

1158 Riverside St
Address of Proposed Site

797-3524 797-3524
Applicant or Agent Daytime Telephone, Fax

357-A-001
Assessor's Reference: Chart-Block-Lot

Proposed Development (check all that apply): ☒ New Building ☐ Building Addition ☐ Change Of Use ☐ Residential
☐ Office ☐ Retail ☐ Manufacturing ☐ Warehouse/Distribution ☐ Parking Lot ☐ Other (specify) Maintenance -Golf

5,000 Sq Ft
Proposed Building square Feet or # of Units

Acreage of Site

Zoning

Check Review Required:

☒ Site Plan (major/minor)
☐ Subdivision # of lots
☐ PAD Review
☐ 14-403 Streets Review
☐ Flood Hazard
☐ Shoreland
☐ HistoricPreservation
☐ DEP Local Certification
☐ Zoning Conditional Use (ZBA/PB)
☐ Zoning Variance
☐ Other

Fees Paid: Site Plan $300.00 Subdivision Engineer Review Date: 8/15/97

DRC Approval Status: Reviewer Jim Wendel

☒ **Approved**
☐ **Approved w/Conditions** see attache
☐ **Denied**

Approval Date 9/18/97 Approval Expiration 9/18/98 Extension to ☐ Additional Sheets Attached

☒ Condition Compliance Jim Wendel (signature) 9/18/97 (date)

Performance Guarantee ☐ **Required*** ☒ **Not Required**

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☐ Performance Guarantee Reduced	date	remaining balance	signature
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19970059
I. D. Number

CITY OF PORTLAND, MAINE
DEVELOPMENT REVIEW APPLICATION
PLANNING DEPARTMENT PROCESSING FORM

Riverside Golf Course
Applicant

8/15/97
Application Date

158 Riverside St, Portland, ME 04103
Applicant's Mailing Address

Riverside Golf Course
Project Name/Description

David Grygiel
Consultant/Agent

1158 Riverside St
Address of Proposed Site

797-3524 797-3524
Applicant or Agent Daytime Telephone, Fax

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5,000 Sq Ft
Proposed Building square Feet or # of Units

Acreage of Site

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Check Review Required:

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☐ Zoning Variance
☐ Other

Fees Paid: Site Plan $300.00 Subdivision Engineer Review Date 8/15/97

Planning Approval Status:

Reviewer Kandi Talbot

☒ **Approved**
☐ **Approved w/Conditions** See Attached
☐ **Denied**

Approval Date 9/23/97 Approval Expiration 9/23/98 Extension to

☒ OK to Issue Building Permit Kandi Talbot (signature) 9/23/97 (date)
☐ Additional Sheets Attached

Performance Guarantee ☐ **Required*** ☒ **Not Required**

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Planning & Urban Development

Joseph E. Gray Jr.
Director

CITY OF PORTLAND

August 22, 1997

Mr. David Grygiel
Riverside Golf Course
1158 Riverside Street
Portland, ME 04103

RE: Maintenance Building, Riverside Golf Course

Dear Mr. Grygiel:

A preliminary review of the site plan submitted on August 15, 1997 has been completed. The following information is requested.

- A written statement was not included in the submission. Attached is a list of what should be included in the written statement.
- What material will be used for the facade of the building?
- The site plan shows no stormwater management detention. Please state why stormwater management detention is not being proposed.

If you have any questions, please do not hesitate to contact me.

Sincerely,

Kandice Talbot

Kandice Talbot
Planner

I. D. Number

CITY OF PORTLAND, MAINE
DEVELOPMENT REVIEW APPLICATION
PLANNING DEPARTMENT PROCESSING FORM

Riverside Golf Course
Applicant

8/15/97
Application Date

158 Riverside St, Portland, ME 04103
pplicant's Mailing Address

Riverside Golf Course
Project Name/Description

avid Grygiel
onsultant/Agent

1158 Riverside St
Address of Proposed Site

97-3524 **797-3524**
pplicant or Agent Daytime Telephone, Fax

357-A-001
Assessor's Reference: Chart-Block-Lot

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☐ Office ☐ Retail ☐ Manufacturing ☐ Warehouse/Distribution ☐ Parking Lot ☐ Other (specify) **Maintenance -Golf**

,000 Sq Ft
roposed Building square Feet or # of Units

Acreage of Site

Zoning

heck Review Required:

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☐ Zoning Variance
☐ Other

ees Paid: Site Plan **$300.00** Subdivision Engineer Review Date: **8/15/97**

lanning Approval Status: Reviewer

☐ **Approved**
☐ **Approved w/Conditions** See Attached
☐ **Denied**

Approval Date Approval Expiration Extension to

☐ OK to Issue Building Permit signature date

☐ Additional Sheets Attached

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☐ Defect Guarantee Submitted — submitted date / amount / expiration date
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Riverside Golf Course

4/14/99

1. Comparing the existing topo between the two plans is puzzling; there is a different datum and the contouring is different. The new location may be the result of a much better ground survey. I would ask them if that is the case. - Yes S.W. Cole Survey - But doesn't show wetlands

2. The new location does pull the disturbance area away from the wetlands; which is good.

3. I missed this point the first time; but I believe they require a permit by rule with the State given the proximity of the ground disturbance to the wetland. They should check this. If so, the City should get a copy of the application.

If any questions, give me a call.

Jim W.

Lita
Tel-2010

Planning & Urban Development

Joseph E. Gray Jr.
Director

CITY OF PORTLAND

August 9, 1999

Riverside Golf Course
1158 Riverside Street
Portland, ME 04103

re: 1158 Riverside Street, Maintenance Garage

Dear Sir:

On July 22, 1999 the Portland Planning Authority granted minor site plan approval for a maintenance building located at 1158 Riverside Street.

The approval is based on the submitted site plan. If you need to make any modifications to the approved site plan, you must submit a revised site plan for staff review and approval.

Please note the following provisions and requirements for all site plan approvals:

1. The site plan approval will be deemed to have expired unless work in the development has commenced within one (1) year of the approval or within a time period agreed upon in writing by the City and the applicant. A one year extension may be granted by this department if requested by the applicant in writing prior to the expiration date of the site plan.

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4. Prior to construction, a preconstruction meeting shall be held at the project site with the contractor, development review coordinator, Public Work's representative and owner to review the construction schedule and critical aspects of the site work. At that time, the site/building contractor shall provide three (3) copies of a detailed construction schedule to the attending City representatives. It shall be the contractor's responsibility to arrange a mutually agreeable time for the preconstruction meeting.

5. If work will occur within the public right-of-way such as utilities, curb, sidewalk and driveway construction, a street opening permit(s) is required for your site. Please contact Carol Merritt at 874-8300, ext. 8828. (Only excavators licensed by the City of Portland are eligible.)

ADDENDUM #1
CITY OF PORTLAND, MAINE
BID #8799

MAINTENANCE GARAGE AT RIVERSIDE GOLF COURSE

DATE: MAY 26, 1999

The attention of firms submitting proposals for the work named in the above Invitation is called to the following modifications to the documents as were issued.

The items set forth herein, whether of clarification, omission, addition and/or substitution, shall be included and form a part of the Contractor's submitted material and the corresponding Contract when executed. No claim for additional compensation, due to lack of knowledge of the contents of this Addendum will be considered.

****

ALL BIDDERS ARE ADVISED THAT RECEIPT OF THIS NOTICE MUST BE DULY ACKNOWLEDGED ON THE BID PROPOSAL FORM OR BY THE INSERTION OF THIS SHEET, SIGNED, AND SUBMITTED WITH YOUR PROPOSAL.

****

ELLEN L. SANBORN
ASSISTANT FINANCE DIRECTOR

Please see attached for responses to questions received.
Please see attached for list of pre-bid meeting attendees.

Receipt of Addendum No. 1 to the City of Portland's BID #8799 for Maintenance Garage at Riverside Golf Course is hereby acknowledged.

COMPANY NAME:_____

SIGNED BY:_____ DATE:_____

PRINT NAME & TITLE:_____

ADDRESS: _____

_____
Zip Code

Answers to Questions:

Q. **Given that you have requested stamped engineered foundation drawings from the general contractors, can the foundation and slab foot print be left as is and bot be re-engineered for cost savings?**

A. Yes.

Q. **Has page 3 of section 08710 been left intentionally or is it a mis-copy?**

A. In the spec. there are two pages labeled 1 then one labeled 2 then one labeled 4. Please label the first page 1, the second page 2, the third page 3 and leave the page labeled 4 as is.

Q. **Portland's Roof Snow ordinance is 50#, the spec calls for 60#. Can it be changed to 50#?**

A. The ground snow load for Portland is 60#. When calculating the roof load, the ground snow load may be multiplied by 0.7 to get the roof load. This will give you a roof load of 42#.

Q. **If you look on Drawing S3, the Mezzanine Floor Framing Plan, you can see that the floor framing does not go to the endwall. There is a section 2/S3 which is indicated wrong. Drawing A2 mezzanine plan shows the mezzanine covering the whole 50' area. All the section 4/A2 shows the same. Please clarify the structural plan change.**

A. Remove the detail bubble 2/S3 at the bottom of the "Mezzanine Floor Structural Framing Plan" at the bottom of the plan. Add a 2/S3 detail bubble at the endwell of "Mezzanine Floor Structural Framing Plan". Add TJI joists the entire length of the mezzanine for an entire 50'-0". Add a "A" lintel on the "Mezzanine Floor Framing Plan" over the window in the "Parts Storage Room".

ADDENDUM #2
CITY OF PORTLAND, MAINE
BID #8799

MAINTENANCE GARAGE AT RIVERSIDE GOLF COURSE

DATE: JUNE 2, 1999

The attention of firms submitting proposals for the work named in the above Invitation is called to the following modifications to the documents as were issued.

The items set forth herein, whether of clarification, omission, addition and/or substitution, shall be included and form a part of the Contractor's submitted material and the corresponding Contract when executed. No claim for additional compensation, due to lack of knowledge of the contents of this Addendum will be considered.

****

ALL BIDDERS ARE ADVISED THAT RECEIPT OF THIS NOTICE MUST BE DULY ACKNOWLEDGED ON THE BID PROPOSAL FORM OR BY THE INSERTION OF THIS SHEET, SIGNED, AND SUBMITTED WITH YOUR PROPOSAL.

****

ELLEN L. SANBORN
ASSISTANT FINANCE DIRECTOR

Please be advised that the bid opening date for this bid has been changed; the new bid date/time is: 3:00 P.M., Wednesday, June 9, 1999.

Please replace pages existing pages 4 and 5 the proposal section with the attached pages 4 and 5, REVISED PROPOSAL.

Receipt of Addendum No. 2 to the City of Portland's BID #8799 for Maintenance Garage at Riverside Golf Course is hereby acknowledged.

COMPANY NAME:_____

SIGNED BY:_____ DATE:_____

PRINT NAME & TITLE:_____

ADDRESS: _____

_____
Zip Code

PROPOSAL
(REVISED)

The undersigned having carefully examined the site of the work, the Plans, including all current amendments or revisions thereof; and Contract Agreement contained herein for the Maintenance Garage, Riverside Municipal Golf Course, on which proposals will be received until the time specified in the "Notice to Contractors", and in case of award, do(es) hereby propose and offer to enter into a contract to supply all the materials, tools, equipment and labor required to perform and construct the whole of the work in strict accordance with the terms and conditions of this contract at the prices stated in the following Proposal:

A. **BASE BID** - All labor, equipment, materials, and incidentals necessary for the repairs as indicated on the Drawings and in the Specifications.

LUMP SUM PRICE: $_____
(AWARD BASIS)

TIME FOR COMPLETION: OCTOBER 31, 1999

WARRANTY OF WORK: _____

ALTERNATES

ADD ALTERNATE No. 1 - WORK BENCHES AND SHELVES (SHEET A2)

ADD $_____

This proposal acknowledges the receipt of Addenda No.: _____
If Applicable

The UNDERSIGNED also agrees as follows:

To do any extra work, not covered by the above specifications, which may be ordered by the City, and to accept as full compensation therefore such prices as may be agreed upon in writing by the City and the Contractor.

The UNDERSIGNED hereby declares that he she or they are the only person(s), firm or corporation interested in this proposal as principal; that it is made without any connection with any other person(s), firm or corporation submitting a bid for the same.

The UNDERSIGNED hereby declares that any person(s) employed by the City of Portland, Maine, who has any direct or indirect personal or financial interest in this proposal or in any portion of the profits which may be derived therefrom has been identified and the interest disclosed by separate attachment. (Please include in your

disclosure any interest which you know of. An example of a direct interest would be a City employee who would be paid to perform services under this proposal. An example of any indirect interest would be a City employee who is related to any officers, employees, principal or shareholders of your firm or to you. If in doubt as to status or interest, please disclose to the extent known.)

Respectfully submitted this _____ day of _____ 19_____

IF AN INDIVIDUAL, SIGN HERE

Name of Bidder _____

Authorized Signature _____

Printed Name _____
(Name) (Title)

Address _____

_____

Telephone _____ FAX _____

SOCIAL SECURITY NUMBER: _____

IF A FIRM OR PARTNERSHIP, SIGN HERE

Company Name:_____

Name of Bidder _____

Authorized Signature _____
(Name) (Title)

Address _____

_____

Telephone _____ FAX _____

FEDERAL TAX ID/SOCIAL SECURITY NUMBER:_____

City of Portland
Planning Department

389 Congress Street, 4th Floor
Portland, ME 04101
207-874-8721 or 207-874-8719
Fax: 207-756-8258

FAX TRANSMISSION COVER SHEET

Date: April 22, 1999

To: Lita

From: Kandi Talbot

Fax: 761-2010

Re: Riverside Golf Course

YOU SHOULD RECEIVE 3 *PAGE(S),*
INCLUDING THIS COVER SHEET.
IF YOU DO NOT RECEIVE ALL THE PAGES,
PLEASE CALL 207-874-8721 or 207-874-8719.

CITY OF PORTLAND
Planning and Urban Development Department

MEMORANDUM

TO: Kandi Talbot, Planner

FROM: Jim Wendel, Development Review Coordinator

DATE: April 14, 1999

SUBJECT: Review of Riverside Golf Course Maintenance Building Plan

After review of proposed plan, the following comments were generated.

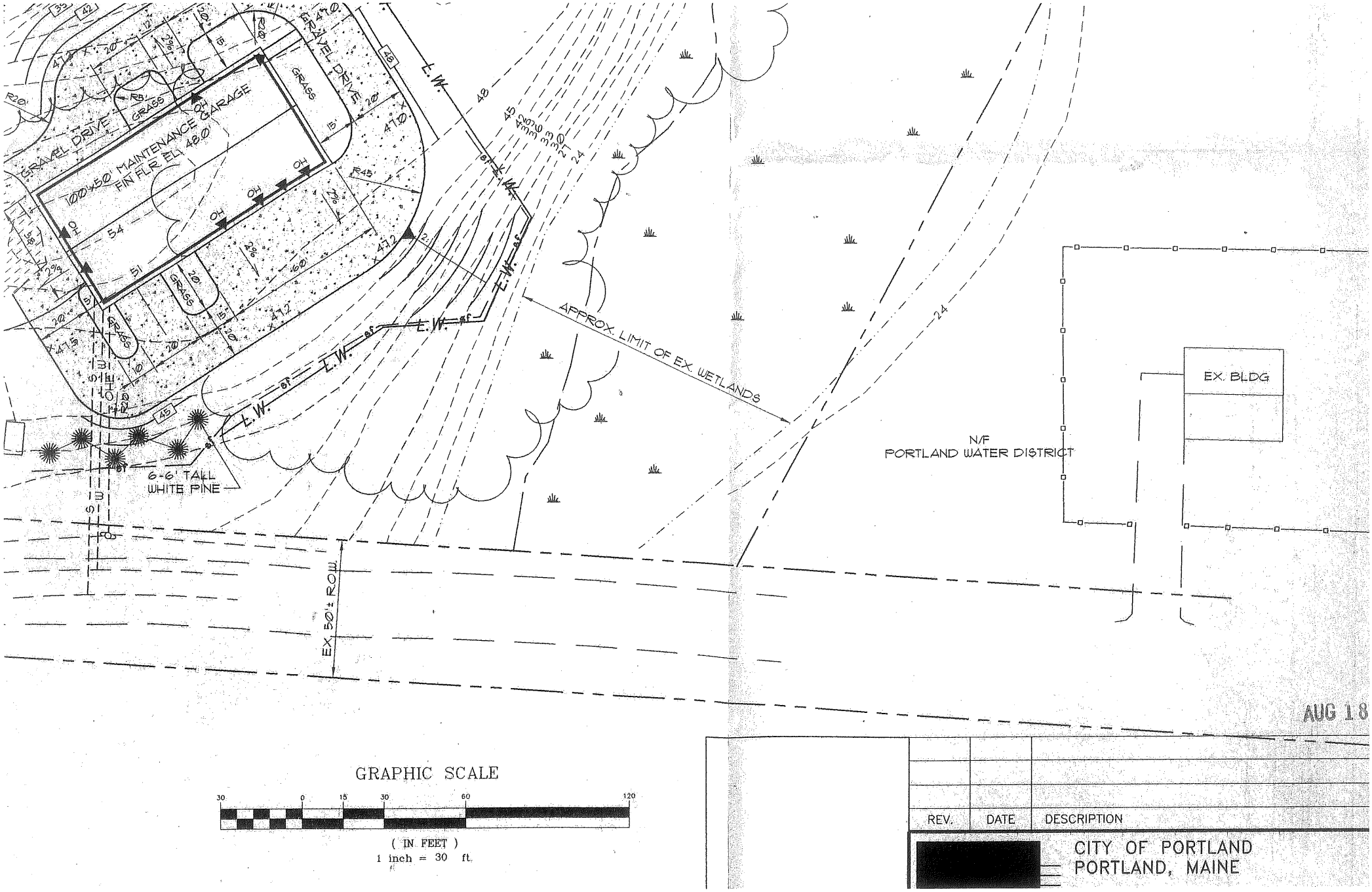
1. Comparing the existing topo between the two plans is puzzling; there is a different datum and the contouring is different. The new location may be the result of a much better ground survey. I would ask them if that is the case.

2. The new location does pull the disturbed area away from the wetlands; which is good.

3. I believe they require a Permit By Rule with the state given the proximity of the ground disturbance to the wetland. They should check this. If so, the City should get a copy of the application.

If any questions, give me a call.

O:\PLAN\CORRESP\DRC\MEMOS\GOLFCOUR.WPD



GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)

1 inch = 30 ft.

AUG 18

REV.	DATE	DESCRIPTION

CITY OF PORTLAND
PORTLAND, MAINE

RIVERSIDE GOLF MAINTENANCE GARAGE
TABLE OF CONTENTS

DIVISION 15 (CONT.)	MECHANICAL
Section	
15950	Controls
15990	Testing, Adjusting, and Balancing

DIVISION 16	ELECTRICAL
Section	
16000	Basic Electrical Requirements

LEGAL SECTION
NOTICE

CITY OF PORTLAND, MAINE
Notice to Contractors

Sealed bids will be received at the Purchasing Office, City Hall, Room 103, 389 Congress Street, Portland, Maine 04101, until 3:00 p.m., Thursday, June 3, 1999, at which time they will be publicly opened, for:

Project Name: Maintenance Garage - a Pre-Engineered Wood Building (Bid #8799)
Riverside Municipal Golf Course, 1158 Riverside Street, Portland.

Abbreviated Written Summary: Briefly and without force and effect upon the contract documents, the work of the contract can be summarized as follows:

This project consists of providing a new 5000+/- square foot pre-engineered wood maintenance building at the north end of the Riverside Golf Course parking lot. The space will include +/- 1,250 sf of office, break room, bathroom areas, +/- 1,250 sf of heated maintenance garage, +/- 2,500 sf of cold equipment storage and an additional +/- 1,250 sf of storage mezzanine. Sitework includes clearing, excavation, utilities, concrete pads and gravel drives. The structure will consist of a C.I.P. concrete foundation and slabs, wood framed walls, pre-engineered, wood trusses, metal sided structure with overhead doors.

MANDATORY PRE-BID CONFERENCE

There will be a mandatory pre-bid meeting held at the site on Thursday, May 20 ,1999, at 8:00 a.m. Only those firms represented at this meeting may bid on the project.

The above named plans, specifications and proposal forms may be seen at the Purchasing Office, City Hall, Room 103, 389 Congress Street, in the office of the Director of Parks and Recreation, 17 Arbor Street, or in the office of PORT CITY ARCHITECTURE, 65 Newbury Street, Portland, Maine.

Each prospective bidder will be required to obtain from the City each copy of the proposal form and each set of plans. Plans and proposal books are available for purchase at the Purchasing Office, Room 103, City hall, upon payment in advance of $75.00 for each complete set of documents or $80.00 if mailed. Partial sets will not be issued. E-mail JTL@ci.portland.me.us or phone (207) 874-8654, fax 874-8652.

CITY OF PORTLAND, MAINE

ADVERTISE: MAINE SUNDAY TELEGRAM n/a
PORTLAND PRESS HERALD Thursday, May 13, 1999
PLEASE CHARGE TO ACCOUNT #124679; TELEPHONE NO. 874-8300.

BID NO. 8799

City of Portland, Maine

MAINTENANCE GARAGE - A PRE-ENGINEERED WOOD BUILDING
RIVERSIDE MUNICIPAL GOLF COURSE

INSTRUCTIONS TO BIDDERS

Sealed bids to provide a new 5,000 square foot, pre-engineered maintenance garage at the Riverside Municipal Golf Course, 1158 Riverside Street, Portland Maine, as specified herein, will be received by the Purchasing Office, City Hall, 389 Congress Street, Room 103, Portland, Maine 04101, until 3 P.M., Thursday, June 3, 1999, at which time they will be publicly opened.

Proposals shall *only* be submitted on the City provided forms. All these documents must be returned in a sealed envelope plainly marked with the bid's title and number. Late or tele-facsimile bids, unsigned bids, and/or bids submitted without the required amount and form of bid surety shall not be accepted. All bids shall be held open to acceptance for sixty days from their opening.

MANDATORY PRE-BID MEETING

There will be mandatory pre-bid site inspection at 8:00 a.m., Thursday, May 20, 1999, conducted at the site. Only firms represented at this meeting may submit a bid.

All questions shall be directed in writing to the Purchasing Office and be received no later than five working days before the bid opening. Questions may be hand delivered, mailed to the City's Purchasing Office, faxed to the Purchasing Office, at (207) 874-8652, or e-mailed to **JTL@ci.portland.me.us**. Responses, that require changes in the specifications will be issued in the form of a written Addendum and sent to those bid holders registered as plan holders in Purchasing. Oral explanations or interpretations given before the award of the contract will not be binding.

BID SURETY - Each proposal must be accompanied by a deposit equal to **5% of the amount bid.** This must be in one of the following forms: a certified check, bank treasurer's check, bank cashier's check, money order, cash or bid bond. Checks and money orders shall be made payable to *the City of Portland*, and will be deposited in its account. Such deposits will be returned to bidders within a reasonable time after contract is signed. If the successful bidder fails to sign the contract within 10 days after notification by the Corporation Counsel's office, the proposal will lapse at the election of the City and the bid deposit will be forfeited and retained by the City as an agreed amount of liquidated damages.

The work shall be as detailed in the attached pages of specifications, and shall be conducted under the direction of the Director of Parks and Recreation, or designee. It is the City's desire that the work be finished by October 31, 1999. The time for performance may only be extended in writing by the City. Liquidated damages of one hundred dollars per day shall be due to the City for every calendar day that the contractor fails to meet the deadline or any extensions thereof. Final payment will not be rendered until all work has been completed and accepted and proper manufacturer's documentation submitted.

The successful contractor shall furnish all labor, materials and equipment necessary to do this work as is specified in a workmanlike and orderly manner and all work shall be performed in accordance with the best trade practice. Any item of material, equipment or labor not mentioned in the Specifications but which is required to complete the project as specified, must be included in the bid by the bidder.

Fees and/or permits will be the responsibility of the Contractor. No fees will be waived by the City. The costs for these items shall be included in each bidder's proposal.

The City of Portland, Maine, reserves the right to accept any bid, to waive any informalities in bids or to reject any or all bids, should it be deemed for the best interest of the City to do so. The City reserves the right to substantiate bidder's qualifications, capability to perform, availability, past performance record and to verify that the bidder is current in its obligations to the City.

May 13, 1999

John T. Lynam
Purchasing Agent

interest, please disclose to the extent known.)

Respectfully submitted this _____ day of _____ 19_____

IF AN INDIVIDUAL, SIGN HERE

Name of Bidder _____

Authorized Signature _____

Printed Name _____
(Name) (Title)

Address _____

_____

Telephone _____ FAX _____

SOCIAL SECURITY NUMBER: _____

IF A FIRM OR PARTNERSHIP, SIGN HERE

Company Name:_____

Name of Bidder _____

Authorized Signature _____
(Name) (Title)

Address _____

_____

Telephone _____ FAX _____

FEDERAL TAX ID/SOCIAL SECURITY NUMBER:_____

ALL CORPORATIONS SHALL COMPLETE THIS FORM
AND SUBMIT WITH THE BID PROPOSAL

(Insert copy of that part of the records of the corporation wherein authority was given to the officer of that corporation to sign this bid on behalf of the corporation.)

_____

_____

_____

_____

_____

_____

_____
Date

The above is a true copy of the records of the _____

_____ Corporation, which records are in my legal custody.

_____
Official having custody of the records

_____ss:

Before me appeared _____, _____

_____ of the _____

Corporation, and made oath that the above statement is true.

_____
Notary Public
(Signature and Seal)

THE AMERICAN INSTITUTE OF ARCHITECTS

AIA Document A201

General Conditions of the Contract for Construction

THIS DOCUMENT HAS IMPORTANT LEGAL CONSEQUENCES: CONSULTATION WITH AN ATTORNEY IS ENCOURAGED WITH RESPECT TO ITS MODIFICATION

1987 EDITION

TABLE OF ARTICLES

This document has been approved and endorsed by the Associated General Contractors of America.

Work without the specific written consent of the Owner and Architect. The Contractor, Subcontractors, Sub-subcontractors and material or equipment suppliers are granted a limited license to use and reproduce applicable portions of the Drawings, Specifications and other documents prepared by the Architect appropriate to and for use in the execution of their Work under the Contract Documents. All copies made under this license shall bear the statutory copyright notice, if any, shown on the Drawings, Specifications and other documents prepared by the Architect. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with this Project is not to be construed as publication in derogation of the Architect's copyright or other reserved rights.

1.4 CAPITALIZATION

1.4.1 Terms capitalized in these General Conditions include those which are (1) specifically defined, (2) the titles of numbered articles and identified references to Paragraphs, Subparagraphs and Clauses in the document or (3) the titles of other documents published by the American Institute of Architects.

1.5 INTERPRETATION

1.5.1 In the interest of brevity the Contract Documents frequently omit modifying words such as "all" and "any" and articles such as "the" and "an," but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement.

ARTICLE 2

OWNER

2.1 DEFINITION

2.1.1 The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The term "Owner" means the Owner or the Owner's authorized representative.

2.1.2 The Owner upon reasonable written request shall furnish to the Contractor in writing information which is necessary and relevant for the Contractor to evaluate, give notice of or enforce mechanic's lien rights. Such information shall include a correct statement of the record legal title to the property on which the Project is located, usually referred to as the site, and the Owner's interest therein at the time of execution of the Agreement and, within five days after any change, information of such change in title, recorded or unrecorded.

2.2 INFORMATION AND SERVICES REQUIRED OF THE OWNER

2.2.1 The Owner shall, at the request of the Contractor, prior to execution of the Agreement and promptly from time to time thereafter, furnish to the Contractor reasonable evidence that financial arrangements have been made to fulfill the Owner's obligations under the Contract. *[Note: Unless such reasonable evidence were furnished on request prior to the execution of the Agreement, the prospective contractor would not be required to execute the Agreement or to commence the Work.]*

2.2.2 The Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site.

2.2.3 Except for permits and fees which are the responsibility of the Contractor under the Contract Documents, the Owner shall secure and pay for necessary approvals, easements, assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities.

2.2.4 Information or services under the Owner's control shall be furnished by the Owner with reasonable promptness to avoid delay in orderly progress of the Work.

2.2.5 Unless otherwise provided in the Contract Documents, the Contractor will be furnished, free of charge, such copies of Drawings and Project Manuals as are reasonably necessary for execution of the Work.

2.2.6 The foregoing are in addition to other duties and responsibilities of the Owner enumerated herein and especially those in respect to Article 6 (Construction by Owner or by Separate Contractors), Article 9 (Payments and Completion) and Article 11 (Insurance and Bonds).

2.3 OWNER'S RIGHT TO STOP THE WORK

2.3.1 If the Contractor fails to correct Work which is not in accordance with the requirements of the Contract Documents as required by Paragraph 12.2 or persistently fails to carry out Work in accordance with the Contract Documents, the Owner, by written order signed personally or by an agent specifically so empowered by the Owner in writing, may order the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, except to the extent required by Subparagraph 6.1.3.

2.4 OWNER'S RIGHT TO CARRY OUT THE WORK

2.4.1 If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a seven-day period after receipt of written notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may after such seven-day period give the Contractor a second written notice to correct such deficiencies within a second seven-day period. If the Contractor within such second seven-day period after receipt of such second notice fails to commence and continue to correct any deficiencies, the Owner may, without prejudice to other remedies the Owner may have, correct such deficiencies. In such case an appropriate Change Order shall be issued deducting from payments then or thereafter due the Contractor the cost of correcting such deficiencies, including compensation for the Architect's additional services and expenses made necessary by such default, neglect or failure. Such action by the Owner and amounts charged to the Contractor are both subject to prior approval of the Architect. If payments then or thereafter due the Contractor are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner.

ARTICLE 3

CONTRACTOR

3.1 DEFINITION

3.1.1 The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The term "Contractor" means the Contractor or the Contractor's authorized representative.

.3 Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum and not in the allowances;

.4 whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances under Clause 3.8.2.2 and (2) changes in Contractor's costs under Clause 3.8.2.3.

3.9 SUPERINTENDENT

3.9.1 The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site during performance of the Work. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor. Important communications shall be confirmed in writing. Other communications shall be similarly confirmed on written request in each case.

3.10 CONTRACTOR'S CONSTRUCTION SCHEDULES

3.10.1 The Contractor, promptly after being awarded the Contract, shall prepare and submit for the Owner's and Architect's information a Contractor's construction schedule for the Work. The schedule shall not exceed time limits current under the Contract Documents, shall be revised at appropriate intervals as required by the conditions of the Work and Project, shall be related to the entire Project to the extent required by the Contract Documents, and shall provide for expeditious and practicable execution of the Work.

3.10.2 The Contractor shall prepare and keep current, for the Architect's approval, a schedule of submittals which is coordinated with the Contractor's construction schedule and allows the Architect reasonable time to review submittals.

3.10.3 The Contractor shall conform to the most recent schedules.

3.11 DOCUMENTS AND SAMPLES AT THE SITE

3.11.1 The Contractor shall maintain at the site for the Owner one record copy of the Drawings, Specifications, addenda, Change Orders and other Modifications, in good order and marked currently to record changes and selections made during construction, and in addition approved Shop Drawings, Product Data, Samples and similar required submittals. These shall be available to the Architect and shall be delivered to the Architect for submittal to the Owner upon completion of the Work.

3.12 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

3.12.1 Shop Drawings are drawings, diagrams, schedules and other data specially prepared for the Work by the Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier or distributor to illustrate some portion of the Work.

3.12.2 Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.

3.12.3 Samples are physical examples which illustrate materials, equipment or workmanship and establish standards by which the Work will be judged.

3.12.4 Shop Drawings, Product Data, Samples and similar submittals are not Contract Documents. The purpose of their submittal is to demonstrate for those portions of the Work for which submittals are required the way the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents. Review by the Architect is subject to the limitations of Subparagraph 4.2.7.

3.12.5 The Contractor shall review, approve and submit to the Architect Shop Drawings, Product Data, Samples and similar submittals required by the Contract Documents with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of separate contractors. Submittals made by the Contractor which are not required by the Contract Documents may be returned without action.

3.12.6 The Contractor shall perform no portion of the Work requiring submittal and review of Shop Drawings, Product Data, Samples or similar submittals until the respective submittal has been approved by the Architect. Such Work shall be in accordance with approved submittals.

3.12.7 By approving and submitting Shop Drawings, Product Data, Samples and similar submittals, the Contractor represents that the Contractor has determined and verified materials, field measurements and field construction criteria related thereto, or will do so, and has checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

3.12.8 The Contractor shall not be relieved of responsibility for deviations from requirements of the Contract Documents by the Architect's approval of Shop Drawings, Product Data, Samples or similar submittals unless the Contractor has specifically informed the Architect in writing of such deviation at the time of submittal and the Architect has given written approval to the specific deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples or similar submittals by the Architect's approval thereof.

3.12.9 The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples or similar submittals, to revisions other than those requested by the Architect on previous submittals.

3.12.10 Informational submittals upon which the Architect is not expected to take responsive action may be so identified in the Contract Documents.

3.12.11 When professional certification of performance criteria of materials, systems or equipment is required by the Contract Documents, the Architect shall be entitled to rely upon the accuracy and completeness of such calculations and certifications.

3.13 USE OF SITE

3.13.1 The Contractor shall confine operations at the site to areas permitted by law, ordinances, permits and the Contract Documents and shall not unreasonably encumber the site with materials or equipment.

3.14 CUTTING AND PATCHING

3.14.1 The Contractor shall be responsible for cutting, fitting or patching required to complete the Work or to make its parts fit together properly.

3.14.2 The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner or separate contractors by cutting, patching or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter such construction by the

tractor, Subcontractors, or their agents or employees, or of any other persons performing portions of the Work.

4.2.4 Communications Facilitating Contract Administration. Except as otherwise provided in the Contract Documents or when direct communications have been specially authorized, the Owner and Contractor shall endeavor to communicate through the Architect. Communications by and with the Architect's consultants shall be through the Architect. Communications by and with Subcontractors and material suppliers shall be through the Contractor. Communications by and with separate contractors shall be through the Owner.

4.2.5 Based on the Architect's observations and evaluations of the Contractor's Applications for Payment, the Architect will review and certify the amounts due the Contractor and will issue Certificates for Payment in such amounts.

4.2.6 The Architect will have authority to reject Work which does not conform to the Contract Documents. Whenever the Architect considers it necessary or advisable for implementation of the intent of the Contract Documents, the Architect will have authority to require additional inspection or testing of the Work in accordance with Subparagraphs 13.5.2 and 13.5.3, whether or not such Work is fabricated, installed or completed. However, neither this authority of the Architect nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect to the Contractor, Subcontractors, material and equipment suppliers, their agents or employees, or other persons performing portions of the Work.

4.2.7 The Architect will review and approve or take other appropriate action upon the Contractor's submittals such as Shop Drawings, Product Data and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Architect's action will be taken with such reasonable promptness as to cause no delay in the Work or in the activities of the Owner, Contractor or separate contractors, while allowing sufficient time in the Architect's professional judgment to permit adequate review. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Architect's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Paragraphs 3.3, 3.5 and 3.12. The Architect's review shall not constitute approval of safety precautions or, unless otherwise specifically stated by the Architect, of any construction means, methods, techniques, sequences or procedures. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

4.2.8 The Architect will prepare Change Orders and Construction Change Directives, and may authorize minor changes in the Work as provided in Paragraph 7.4.

4.2.9 The Architect will conduct inspections to determine the date or dates of Substantial Completion and the date of final completion, will receive and forward to the Owner for the Owner's review and records written warranties and related documents required by the Contract and assembled by the Contractor, and will issue a final Certificate for Payment upon compliance with the requirements of the Contract Documents.

4.2.10 If the Owner and Architect agree, the Architect will provide one or more project representatives to assist in carrying out the Architect's responsibilities at the site. The duties, responsibilities and limitations of authority of such project representatives shall be as set forth in an exhibit to be incorporated in the Contract Documents.

4.2.11 The Architect will interpret and decide matters concerning performance under and requirements of the Contract Documents on written request of either the Owner or Contractor. The Architect's response to such requests will be made with reasonable promptness and within any time limits agreed upon. If no agreement is made concerning the time within which interpretations required of the Architect shall be furnished in compliance with this Paragraph 4.2, then delay shall not be recognized on account of failure by the Architect to furnish such interpretations until 15 days after written request is made for them.

4.2.12 Interpretations and decisions of the Architect will be consistent with the intent of and reasonably inferable from the Contract Documents and will be in writing or in the form of drawings. When making such interpretations and decisions, the Architect will endeavor to secure faithful performance by both Owner and Contractor, will not show partiality to either and will not be liable for results of interpretations or decisions so rendered in good faith.

4.2.13 The Architect's decisions on matters relating to aesthetic effect will be final if consistent with the intent expressed in the Contract Documents.

4.3 CLAIMS AND DISPUTES

4.3.1 Definition. A Claim is a demand or assertion by one of the parties seeking, as a matter of right, adjustment or interpretation of Contract terms, payment of money, extension of time or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. Claims must be made by written notice. The responsibility to substantiate Claims shall rest with the party making the Claim.

4.3.2 Decision of Architect. Claims, including those alleging an error or omission by the Architect, shall be referred initially to the Architect for action as provided in Paragraph 4.4. A decision by the Architect, as provided in Subparagraph 4.4.4, shall be required as a condition precedent to arbitration or litigation of a Claim between the Contractor and Owner as to all such matters arising prior to the date final payment is due, regardless of (1) whether such matters relate to execution and progress of the Work or (2) the extent to which the Work has been completed. The decision by the Architect in response to a Claim shall not be a condition precedent to arbitration or litigation in the event (1) the position of Architect is vacant, (2) the Architect has not received evidence or has failed to render a decision within agreed time limits, (3) the Architect has failed to take action required under Subparagraph 4.4.4 within 30 days after the Claim is made, (4) 45 days have passed after the Claim has been referred to the Architect or (5) the Claim relates to a mechanic's lien.

4.3.3 Time Limits on Claims. Claims by either party must be made within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the claimant first recognizes the condition giving rise to the Claim, whichever is later. Claims must be made by written notice. An additional Claim made after the initial Claim has been implemented by Change Order will not be considered unless submitted in a timely manner.

4.5.2 Rules and Notices for Arbitration. Claims between the Owner and Contractor not resolved under Paragraph 4.4 shall, if subject to arbitration under Subparagraph 4.5.1, be decided by arbitration in accordance with the Construction Industry Arbitration Rules of the American Arbitration Association currently in effect, unless the parties mutually agree otherwise. Notice of demand for arbitration shall be filed in writing with the other party to the Agreement between the Owner and Contractor and with the American Arbitration Association, and a copy shall be filed with the Architect.

4.5.3 Contract Performance During Arbitration. During arbitration proceedings, the Owner and Contractor shall comply with Subparagraph 4.3.4.

4.5.4 When Arbitration May Be Demanded. Demand for arbitration of any Claim may not be made until the earlier of (1) the date on which the Architect has rendered a final written decision on the Claim, (2) the tenth day after the parties have presented evidence to the Architect or have been given reasonable opportunity to do so, if the Architect has not rendered a final written decision by that date, or (3) any of the five events described in Subparagraph 4.5.2.

4.5.4.1 When a written decision of the Architect states that (1) the decision is final but subject to arbitration and (2) a demand for arbitration of a Claim covered by such decision must be made within 30 days after the date on which the party making the demand receives the final written decision, then failure to demand arbitration within said 30 days' period shall result in the Architect's decision becoming final and binding upon the Owner and Contractor. If the Architect renders a decision after arbitration proceedings have been initiated, such decision may be entered as evidence, but shall not supersede arbitration proceedings unless the decision is acceptable to all parties concerned.

4.5.4.2 A demand for arbitration shall be made within the time limits specified in Subparagraphs 4.5.1 and 4.5.4 and Clause 4.5.4.1 as applicable, and in other cases within a reasonable time after the Claim has arisen, and in no event shall it be made after the date when institution of legal or equitable proceedings based on such Claim would be barred by the applicable statute of limitations as determined pursuant to Paragraph 13.7.

4.5.5 Limitation on Consolidation or Joinder. No arbitration arising out of or relating to the Contract Documents shall include, by consolidation or joinder or in any other manner, the Architect, the Architect's employees or consultants, except by written consent containing specific reference to the Agreement and signed by the Architect, Owner, Contractor and any other person or entity sought to be joined. No arbitration shall include, by consolidation or joinder or in any other manner, parties other than the Owner, Contractor, a separate contractor as described in Article 6 and other persons substantially involved in a common question of fact or law whose presence is required if complete relief is to be accorded in arbitration. No person or entity other than the Owner, Contractor or a separate contractor as described in Article 6 shall be included as an original third party or additional third party to an arbitration whose interest or responsibility is insubstantial. Consent to arbitration involving an additional person or entity shall not constitute consent to arbitration of a dispute not described therein or with a person or entity not named or described therein. The foregoing agreement to arbitrate and other agreements to arbitrate with an additional person or entity duly consented to by parties to the Agreement shall be specifically enforceable under applicable law in any court having jurisdiction thereof.

4.5.6 Claims and Timely Assertion of Claims. A party who files a notice of demand for arbitration must assert in the demand all Claims then known to that party on which arbitration is permitted to be demanded. When a party fails to include a Claim through oversight, inadvertence or excusable neglect, or when a Claim has matured or been acquired subsequently, the arbitrator or arbitrators may permit amendment.

4.5.7 Judgment on Final Award. The award rendered by the arbitrator or arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.

ARTICLE 5

SUBCONTRACTORS

5.1 DEFINITIONS

5.1.1 A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the site. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include a separate contractor or subcontractors of a separate contractor.

5.1.2 A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform a portion of the Work at the site. The term "Sub-subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Sub-subcontractor or an authorized representative of the Sub-subcontractor.

5.2 AWARD OF SUBCONTRACTS AND OTHER CONTRACTS FOR PORTIONS OF THE WORK

5.2.1 Unless otherwise stated in the Contract Documents or the bidding requirements, the Contractor, as soon as practicable after award of the Contract, shall furnish in writing to the Owner through the Architect the names of persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for each principal portion of the Work. The Architect will promptly reply to the Contractor in writing stating whether or not the Owner or the Architect, after due investigation, has reasonable objection to any such proposed person or entity. Failure of the Owner or Architect to reply promptly shall constitute notice of no reasonable objection.

5.2.2 The Contractor shall not contract with a proposed person or entity to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.

5.2.3 If the Owner or Architect has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner or Architect has no reasonable objection. The Contract Sum shall be increased or decreased by the difference in cost occasioned by such change and an appropriate Change Order shall be issued. However, no increase in the Contract Sum shall be allowed for such change unless the Contractor has acted promptly and responsively in submitting names as required.

5.2.4 The Contractor shall not change a Subcontractor, person or entity previously selected if the Owner or Architect makes reasonable objection to such change.

ARTICLE 7

CHANGES IN THE WORK

7.1 CHANGES

7.1.1 Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order, Construction Change Directive or order for a minor change in the Work, subject to the limitations stated in this Article 7 and elsewhere in the Contract Documents.

7.1.2 A Change Order shall be based upon agreement among the Owner, Contractor and Architect; a Construction Change Directive requires agreement by the Owner and Architect and may or may not be agreed to by the Contractor; an order for a minor change in the Work may be issued by the Architect alone.

7.1.3 Changes in the Work shall be performed under applicable provisions of the Contract Documents, and the Contractor shall proceed promptly, unless otherwise provided in the Change Order, Construction Change Directive or order for a minor change in the Work.

7.1.4 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are so changed in a proposed Change Order or Construction Change Directive that application of such unit prices to quantities of Work proposed will cause substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.

7.2 CHANGE ORDERS

7.2.1 A Change Order is a written instrument prepared by the Architect and signed by the Owner, Contractor and Architect, stating their agreement upon all of the following:

.1 a change in the Work;

.2 the amount of the adjustment in the Contract Sum, if any; and

.3 the extent of the adjustment in the Contract Time, if any.

7.2.2 Methods used in determining adjustments to the Contract Sum may include those listed in Subparagraph 7.3.3.

7.3 CONSTRUCTION CHANGE DIRECTIVES

7.3.1 A Construction Change Directive is a written order prepared by the Architect and signed by the Owner and Architect, directing a change in the Work and stating a proposed basis for adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions or other revisions, the Contract Sum and Contract Time being adjusted accordingly.

7.3.2 A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order.

7.3.3 If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:

.1 mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;

.2 unit prices stated in the Contract Documents or subsequently agreed upon;

.3 cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or

.4 as provided in Subparagraph 7.3.6.

7.3.4 Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Architect of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.

7.3.5 A Construction Change Directive signed by the Contractor indicates the agreement of the Contractor therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

7.3.6 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the method and the adjustment shall be determined by the Architect on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, a reasonable allowance for overhead and profit. In such case, and also under Clause 7.3.3.3, the Contractor shall keep and present, in such form as the Architect may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Subparagraph 7.3.6 shall be limited to the following:

.1 costs of labor, including social security, old age and unemployment insurance, fringe benefits required by agreement or custom, and workers' or workmen's compensation insurance;

.2 costs of materials, supplies and equipment, including cost of transportation, whether incorporated or consumed;

.3 rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;

.4 costs of premiums for all bonds and insurance, permit fees, and sales, use or similar taxes related to the Work; and

.5 additional costs of supervision and field office personnel directly attributable to the change.

7.3.7 Pending final determination of cost to the Owner, amounts not in dispute may be included in Applications for Payment. The amount of credit to be allowed by the Contractor to the Owner for a deletion or change which results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the Architect. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.

7.3.8 If the Owner and Contractor do not agree with the adjustment in Contract Time or the method for determining it, the adjustment or the method shall be referred to the Architect for determination.

7.3.9 When the Owner and Contractor agree with the determination made by the Architect concerning the adjustments in the Contract Sum and Contract Time, or otherwise reach agreement upon the adjustments, such agreement shall be effective immediately and shall be recorded by preparation and execution of an appropriate Change Order.

Owner a Certificate for Payment, with a copy to the Contractor, for such amount as the Architect determines is properly due, or notify the Contractor and Owner in writing of the Architect's reasons for withholding certification in whole or in part as provided in Subparagraph 9.5.1.

9.4.2 The issuance of a Certificate for Payment will constitute a representation by the Architect to the Owner, based on the Architect's observations at the site and the data comprising the Application for Payment, that the Work has progressed to the point indicated and that, to the best of the Architect's knowledge, information and belief, quality of the Work is in accordance with the Contract Documents. The foregoing representations are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to minor deviations from the Contract Documents correctable prior to completion and to specific qualifications expressed by the Architect. The issuance of a Certificate for Payment will further constitute a representation that the Contractor is entitled to payment in the amount certified. However, the issuance of a Certificate for Payment will not be a representation that the Architect has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work, (2) reviewed construction means, methods, techniques, sequences or procedures, (3) reviewed copies of requisitions received from Subcontractors and material suppliers and other data requested by the Owner to substantiate the Contractor's right to payment or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

9.5 DECISIONS TO WITHHOLD CERTIFICATION

9.5.1 The Architect may decide not to certify payment and may withhold a Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Architect's opinion the representations to the Owner required by Subparagraph 9.4.2 cannot be made. If the Architect is unable to certify payment in the amount of the Application, the Architect will notify the Contractor and Owner as provided in Subparagraph 9.4.1. If the Contractor and Architect cannot agree on a revised amount, the Architect will promptly issue a Certificate for Payment for the amount for which the Architect is able to make such representations to the Owner. The Architect may also decide not to certify payment or, because of subsequently discovered evidence or subsequent observations, may nullify the whole or a part of a Certificate for Payment previously issued, to such extent as may be necessary in the Architect's opinion to protect the Owner from loss because of:

.1 defective Work not remedied;

.2 third party claims filed or reasonable evidence indicating probable filing of such claims;

.3 failure of the Contractor to make payments properly to Subcontractors or for labor, materials or equipment;

.4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;

.5 damage to the Owner or another contractor;

.6 reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay; or

.7 persistent failure to carry out the Work in accordance with the Contract Documents.

9.5.2 When the above reasons for withholding certification are removed, certification will be made for amounts previously withheld.

9.6 PROGRESS PAYMENTS

9.6.1 After the Architect has issued a Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents, and shall so notify the Architect.

9.6.2 The Contractor shall promptly pay each Subcontractor, upon receipt of payment from the Owner, out of the amount paid to the Contractor on account of such Subcontractor's portion of the Work, the amount to which said Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of such Subcontractor's portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in similar manner.

9.6.3 The Architect will, on request, furnish to a Subcontractor, if practicable, information regarding percentages of completion or amounts applied for by the Contractor and action taken thereon by the Architect and Owner on account of portions of the Work done by such Subcontractor.

9.6.4 Neither the Owner nor Architect shall have an obligation to pay or to see to the payment of money to a Subcontractor except as may otherwise be required by law.

9.6.5 Payment to material suppliers shall be treated in a manner similar to that provided in Subparagraphs 9.6.2, 9.6.3 and 9.6.4.

9.6.6 A Certificate for Payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance of Work not in accordance with the Contract Documents.

9.7 FAILURE OF PAYMENT

9.7.1 If the Architect does not issue a Certificate for Payment, through no fault of the Contractor, within seven days after receipt of the Contractor's Application for Payment, or if the Owner does not pay the Contractor within seven days after the date established in the Contract Documents the amount certified by the Architect or awarded by arbitration, then the Contractor may, upon seven additional days' written notice to the Owner and Architect, stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shut-down, delay and start-up, which shall be accomplished as provided in Article 7.

9.8 SUBSTANTIAL COMPLETION

9.8.1 Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so the Owner can occupy or utilize the Work for its intended use.

9.8.2 When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall prepare and submit to the Architect a comprehensive list of items to be completed or corrected. The Contractor shall proceed promptly to complete and correct items on the list. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents. Upon receipt of the Contractor's list, the Architect will make an inspection to determine whether the Work or desig-

ARTICLE 10

PROTECTION OF PERSONS AND PROPERTY

10.1 SAFETY PRECAUTIONS AND PROGRAMS

10.1.1 The Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the performance of the Contract.

10.1.2 In the event the Contractor encounters on the site material reasonably believed to be asbestos or polychlorinated biphenyl (PCB) which has not been rendered harmless, the Contractor shall immediately stop Work in the area affected and report the condition to the Owner and 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 polychlorinated biphenyl (PCB) and has not been rendered harmless. The Work in the affected area shall be resumed in the absence of asbestos or polychlorinated biphenyl (PCB), or when it has been rendered harmless, by written agreement of the Owner and Contractor, or in accordance with final determination by the Architect on which arbitration has not been demanded, or by arbitration under Article 4.

10.1.3 The Contractor shall not be required pursuant to Article 7 to perform without consent any Work relating to asbestos or polychlorinated biphenyl (PCB).

10.1.4 To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the Contractor, Architect, Architect's consultants and agents and employees of any of them from and against claims, damages, losses and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work in the affected area if in fact the material is asbestos or polychlorinated biphenyl (PCB) and has not been rendered harmless, provided that such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself) including loss of use resulting therefrom, but only to the extent caused in whole or in part by negligent acts or omissions of the Owner, anyone directly or indirectly employed by the Owner or anyone for whose acts the Owner may be liable, regardless of whether or not such claim, damage, loss or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity which would otherwise exist as to a party or person described in this Subparagraph 10.1.4.

10.2 SAFETY OF PERSONS AND PROPERTY

10.2.1 The Contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury or loss to:

.1 employees on the Work and other persons who may be affected thereby;

.2 the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody or control of the Contractor or the Contractor's Subcontractors or Sub-subcontractors; and

.3 other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.

10.2.2 The Contractor shall give notices and comply with applicable laws, ordinances, rules, regulations and lawful orders of public authorities bearing on safety of persons or property or their protection from damage, injury or loss.

10.2.3 The Contractor shall erect and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards, promulgating safety regulations and notifying owners and users of adjacent sites and utilities.

10.2.4 When use or storage of explosives or other hazardous materials or equipment or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel.

10.2.5 The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in Clauses 10.2.1.2 and 10.2.1.3 caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Clauses 10.2.1.2 and 10.2.1.3, except damage or loss attributable to acts or omissions of the Owner or Architect or anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Paragraph 3.18.

10.2.6 The Contractor shall designate a responsible member of the Contractor's organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the Owner and Architect.

10.2.7 The Contractor shall not load or permit any part of the construction or site to be loaded so as to endanger its safety.

10.3 EMERGENCIES

10.3.1 In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor's discretion, to prevent threatened damage, injury or loss. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Paragraph 4.3 and Article 7.

ARTICLE 11

INSURANCE AND BONDS

11.1 CONTRACTOR'S LIABILITY INSURANCE

11.1.1 The Contractor shall purchase from and maintain in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located such insurance as will protect the Contractor from claims set forth below which may arise out of or result from the Contractor's operations under the Contract and for which the Contractor may be legally liable, whether such operations be by the Contractor or by a Subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable:

.1 claims under workers' or workmen's compensation, disability benefit and other similar employee benefit acts which are applicable to the Work to be performed;

11.3.5 If during the Project construction period the Owner insures properties, real or personal or both, adjoining or adjacent to the site by property insurance under policies separate from those insuring the Project, or if after final payment property insurance is to be provided on the completed Project through a policy or policies other than those insuring the Project during the construction period, the Owner shall waive all rights in accordance with the terms of Subparagraph 11.3.7 for damages caused by fire or other perils covered by this separate property insurance. All separate policies shall provide this waiver of subrogation by endorsement or otherwise.

11.3.6 Before an exposure to loss may occur, the Owner shall file with the Contractor a copy of each policy that includes insurance coverages required by this Paragraph 11.3. Each policy shall contain all generally applicable conditions, definitions, exclusions and endorsements related to this Project. Each policy shall contain a provision that the policy will not be cancelled or allowed to expire until at least 30 days' prior written notice has been given to the Contractor.

11.3.7 Waivers of Subrogation. The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents and employees, each of the other, and (2) the Architect, Architect's consultants, separate contractors described in Article 6, if any, and any of their subcontractors, sub-subcontractors, agents and employees, for damages caused by fire or other perils to the extent covered by property insurance obtained pursuant to this Paragraph 11.3 or other property insurance applicable to the Work, except such rights as they have to proceeds of such insurance held by the Owner as fiduciary. The Owner or Contractor, as appropriate, shall require of the Architect, Architect's consultants, separate contractors described in Article 6, if any, and the subcontractors, sub-subcontractors, agents and employees of any of them, by appropriate agreements, written where legally required for validity, similar waivers each in favor of other parties enumerated herein. The policies shall provide such waivers of subrogation by endorsement or otherwise. A waiver of subrogation shall be effective as to a person or entity even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, did not pay the insurance premium directly or indirectly, and whether or not the person or entity had an insurable interest in the property damaged.

11.3.8 A loss insured under Owner's property insurance shall be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Subparagraph 11.3.10. The Contractor shall pay Subcontractors their just shares of insurance proceeds received by the Contractor, and by appropriate agreements, written where legally required for validity, shall require Subcontractors to make payments to their Sub-subcontractors in similar manner.

11.3.9 If required in writing by a party in interest, the Owner as fiduciary shall, upon occurrence of an insured loss, give bond for proper performance of the Owner's duties. The cost of required bonds shall be charged against proceeds received as fiduciary. The Owner shall deposit in a separate account proceeds so received, which the Owner shall distribute in accordance with such agreement as the parties in interest may reach, or in accordance with an arbitration award in which case the procedure shall be as provided in Paragraph 4.5. If after such loss no other special agreement is made, replacement of damaged property shall be covered by appropriate Change Order.

11.3.10 The Owner as fiduciary shall have power to adjust and settle a loss with insurers unless one of the parties in interest shall object in writing within five days after occurrence of loss to the Owner's exercise of this power; if such objection be made, arbitrators shall be chosen as provided in Paragraph 4.5. The Owner as fiduciary shall, in that case, make settlement with insurers in accordance with directions of such arbitrators. If distribution of insurance proceeds by arbitration is required, the arbitrators will direct such distribution.

11.3.11 Partial occupancy or use in accordance with Paragraph 9.9 shall not commence until the insurance company or companies providing property insurance have consented to such partial occupancy or use by endorsement or otherwise. The Owner and the Contractor shall take reasonable steps to obtain consent of the insurance company or companies and shall, without mutual written consent, take no action with respect to partial occupancy or use that would cause cancellation, lapse or reduction of insurance.

11.4 PERFORMANCE BOND AND PAYMENT BOND

11.4.1 The Owner shall have the right to require the Contractor to furnish bonds covering faithful performance of the Contract and payment of obligations arising thereunder as stipulated in bidding requirements or specifically required in the Contract Documents on the date of execution of the Contract.

11.4.2 Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall permit a copy to be made.

ARTICLE 12

UNCOVERING AND CORRECTION OF WORK

12.1 UNCOVERING OF WORK

12.1.1 If a portion of the Work is covered contrary to the Architect's request or to requirements specifically expressed in the Contract Documents, it must, if required in writing by the Architect, be uncovered for the Architect's observation and be replaced at the Contractor's expense without change in the Contract Time.

12.1.2 If a portion of the Work has been covered which the Architect has not specifically requested to observe prior to its being covered, the Architect may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, costs of uncovering and replacement shall, by appropriate Change Order, be charged to the Owner. If such Work is not in accordance with the Contract Documents, the Contractor shall pay such costs unless the condition was caused by the Owner or a separate contractor in which event the Owner shall be responsible for payment of such costs.

12.2 CORRECTION OF WORK

12.2.1 The Contractor shall promptly correct Work rejected by the Architect or failing to conform to the requirements of the Contract Documents, whether observed before or after Substantial Completion and whether or not fabricated, installed or completed. The Contractor shall bear costs of correcting such rejected Work, including additional testing and inspections and compensation for the Architect's services and expenses made necessary thereby.

12.2.2 If, within one year after the date of Substantial Completion of the Work or designated portion thereof, or after the date

The Owner shall bear such costs except as provided in Subparagraph 13.5.3.

13.5.3 If such procedures for testing, inspection or approval under Subparagraphs 13.5.1 and 13.5.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, the Contractor shall bear all costs made necessary by such failure including those of repeated procedures and compensation for the Architect's services and expenses.

13.5.4 Required certificates of testing, inspection or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Architect.

13.5.5 If the Architect is to observe tests, inspections or approvals required by the Contract Documents, the Architect will do so promptly and, where practicable, at the normal place of testing.

13.5.6 Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

13.6 INTEREST

13.6.1 Payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at such rate as the parties may agree upon in writing or, in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.

13.7 COMMENCEMENT OF STATUTORY LIMITATION PERIOD

13.7.1 As between the Owner and Contractor:

.1 **Before Substantial Completion.** As to acts or failures to act occurring prior to the relevant date of Substantial Completion, any applicable statute of limitations shall commence to run and any alleged cause of action shall be deemed to have accrued in any and all events not later than such date of Substantial Completion;

.2 **Between Substantial Completion and Final Certificate for Payment.** As to acts or failures to act occurring subsequent to the relevant date of Substantial Completion and prior to issuance of the final Certificate for Payment, any applicable statute of limitations shall commence to run and any alleged cause of action shall be deemed to have accrued in any and all events not later than the date of issuance of the final Certificate for Payment; and

.3 **After Final Certificate for Payment.** As to acts or failures to act occurring after the relevant date of issuance of the final Certificate for Payment, any applicable statute of limitations shall commence to run and any alleged cause of action shall be deemed to have accrued in any and all events not later than the date of any act or failure to act by the Contractor pursuant to any warranty provided under Paragraph 3.5, the date of any correction of the Work or failure to correct the Work by the Contractor under Paragraph 12.2, or the date of actual commission of any other act or failure to perform any duty or obligation by the Contractor or Owner, whichever occurs last.

ARTICLE 14

TERMINATION OR SUSPENSION OF THE CONTRACT

14.1 TERMINATION BY THE CONTRACTOR

14.1.1 The Contractor may terminate the Contract if the Work is stopped for a period of 30 days through no act or fault of the Contractor or a Subcontractor, Sub-subcontractor or their agents or employees or any other persons performing portions of the Work under contract with the Contractor, for any of the following reasons:

.1 issuance of an order of a court or other public authority having jurisdiction;

.2 an act of government, such as a declaration of national emergency, making material unavailable;

.3 because the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Subparagraph 9.4.1, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents;

.4 if repeated suspensions, delays or interruptions by the Owner as described in Paragraph 14.3 constitute in the aggregate more than 100 percent of the total number of days scheduled for completion, or 120 days in any 365-day period, whichever is less; or

.5 the Owner has failed to furnish to the Contractor promptly, upon the Contractor's request, reasonable evidence as required by Subparagraph 2.2.1.

14.1.2 If one of the above reasons exists, the Contractor may, upon seven additional days' written notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed and for proven loss with respect to materials, equipment, tools, and construction equipment and machinery, including reasonable overhead, profit and damages.

14.1.3 If the Work is stopped for a period of 60 days through no act or fault of the Contractor or a Subcontractor or their agents or employees or any other persons performing portions of the Work under contract with the Contractor because the Owner has persistently failed to fulfill the Owner's obligations under the Contract Documents with respect to matters important to the progress of the Work, the Contractor may, upon seven additional days' written notice to the Owner and the Architect, terminate the Contract and recover from the Owner as provided in Subparagraph 14.1.2.

14.2 TERMINATION BY THE OWNER FOR CAUSE

14.2.1 The Owner may terminate the Contract if the Contractor:

.1 persistently or repeatedly refuses or fails to supply enough properly skilled workers or proper materials;

.2 fails to make payment to Subcontractors for materials or labor in accordance with the respective agreements between the Contractor and the Subcontractors;

.3 persistently disregards laws, ordinances, or rules, regulations or orders of a public authority having jurisdiction; or

.4 otherwise is guilty of substantial breach of a provision of the Contract Documents.

14.2.2 When any of the above reasons exist, the Owner, upon certification by the Architect that sufficient cause exists to jus-

EXHIBIT A
SUPPLEMENTARY GENERAL CONDITIONS

THE GENERAL CONDITIONS

The "General Conditions of the Contract for Construction," AIA Document A201, Fourteenth Edition (1987), Articles 1 through 14 inclusive, is a part of this Contract.

THE SUPPLEMENTARY CONDITIONS

The following supplements modify and/or change, delete from and/or add to the General Conditions. Where any Article, Paragraph or subparagraph in the General Conditions is supplemented by one of the following paragraphs, the provisions of such Article, Paragraph, or subparagraph shall remain in effect and the supplemental provisions shall be considered as added thereto. Where any Article, Paragraph, or subparagraph in the General Conditions is amended, voided or superseded by any of the following paragraphs, the provisions of such Article, Paragraph or subparagraph not so amended, voided, or superseded shall remain in effect.

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Delete "Arbitration" and the references pertaining to it.

ARTICLE I GENERAL PROVISIONS

A. Delete the fourth sentence in Subparagraph 1. 1.2 and substitute the following:

"Except as provided in Paragraph 3.18, this Contract Document shall create a contractual relationship solely between the owner and Contractor.

B. Delete Subparagraph 1.2. 1.

C. Add the following to the end of Subparagraph 1.2.3:

"All Work mentioned or indicated in the Contract Documents shall be performed by the Contractor as part of this Contract unless it is specifically indicated in the Contract Documents that such Work is to be done by others. In the event of conflicts or discrepancies among the Contract Documents, the Documents shall be interpreted on the basis of the following priorities:

Highest Priority:	Modifications
Second Priority:	Agreement
Third Priority:	Addenda - later date to take precedence
Fourth Priority:	General Requirements - Division I
Fifth Priority:	Supplementary Conditions

E. Add Subparagraph 2.2.7 as follows:

2.2.7 The Contractor shall be responsible for coordinating the schedule for testing which is mutually agreed upon by Owner, Architect and Contractor. The Owner shall be responsible for the employment of Independent Testing Laboratories (ITL).

The Contractor shall bear all costs for retesting done by the Independent Testing Laboratory (ITL) due to nonconforming work.

F. In the sixth line of Subparagraph 2.3. 1, after the word "may" add the following:

", after Contractor's receipt of a seven (7) day written notice and failure by Contractor to cure,".

G. Delete the first and second sentences of Subparagraph 2.4.1 and substitute the following:

"If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a seven-day period after receipt of written notice from the Owner to begin and prosecute correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, correct such deficiencies."

H. In the third sentence in Subparagraph 2.4. 1, delete the words "Change Order" and substitute the words "Construction Change Directive" and delete the fourth sentence.

ARTICLE 3 CONTRACTOR

A. Delete Subparagraph 3.2.1 and substitute the following:

3.2.1 Before starting the Work, and at frequent intervals during the progress thereof, the Contractor shall carefully review and compare the Contract Documents with each other and with the information furnished by the Owner pursuant to Subparagraph 2.2.2 and shall at once report to the Architect any error, inconsistency or omission the Contractor may discover. Any necessary change shall be ordered as provided in Article 7, subject to the requirements of Paragraph 1.2 and other provisions of the Contract Documents. If the Contractor proceeds with the Work without such notice to the Architect, having discovered such errors, inconsistencies or omissions, or if by reasonable review of the Contract Documents the Contractor could have discovered such, the Contractor shall bear all costs arising therefrom.

that otherwise attainable. If, in the opinion of the Architect, the evidence presented by the Contractor does not provide a sufficient basis for such reasonable certainty, the Architect may reject such substitution or deviation without further investigation.

3.5.6 The Contract Documents are intended to produce a building of consistent character and quality of design. All components of the building including visible items of mechanical and electrical equipment have been selected to have a coordinated design in relation to the overall appearance of the building. The Architect shall judge the design and appearance of proposed substitutes on the basis of their suitability in relation to the overall design of the Project, as well as for their intrinsic merits. The Architect will not approve as equal to materials specified proposed substitutes which, in the Architect's opinion, would be out of character, obtrusive, or otherwise inconsistent with the character or quality of design of the Project. In order to permit coordinated design of color and finishes the Contractor shall, if required by the Architect, furnish the substituted material in any color, finish, texture, or pattern which would have been available from the manufacturer originally specified, at no additional cost to the Owner.

3.5.7 Any additional cost, or any loss or damage arising from the substitution of any material or requirement for those originally specified shall be borne by the Contractor, notwithstanding approval or acceptance of such substitution by the Owner or the Architect, unless such substitution was made at the written request or direction of the Owner or the Architect.

3.5.8 The warranty provided in this paragraph 3.5 shall be in addition to and not in limitation of any other warranty required by the Contract Documents or otherwise prescribed by law.

3.5.9 The Contractor shall procure and deliver to the Architect, no later than the date claimed by the Contractor as the date of Substantial Completion, all special warranties required by the Contract Documents. Delivery by the Contractor shall constitute the Contractor's guarantee to the Owner that the warranty will be performed in accordance with the warranty's terms and conditions.

E. Delete Subparagraph 3.6.1 and substitute the following:

3.6.1 The Owner is a non-profit organization and is exempt from all sales, consumer, use and other similar taxes as provided by law. The Contractor, Subcontractors, sub-subcontractors, material and equipment suppliers and the like, providing taxable goods for incorporation into the Work shall take this into account, so that the Owner does not pay such taxes. Obtain rebates for any taxes incorrectly paid and reimburse the Owner in the full amount on a Change

H. Add Subparagraphs 3.10.4 and 3.10.5 as follows:

3.10.4 The Progress Schedule shall be based on an orderly progression of the Work, allowing adequate time for each operation (including adequate time for submission and review of submittals), and leading to a reasonable certainty of Substantial Completion by the date established in the Agreement. The Progress Schedule will be reviewed by the Architect for compliance with the requirements of this Article and Section 01300 and will be accepted by the Architect or returned to the Contractor for revision and resubmittal.

3.10.5 If the Architect in agreement with the owner has determined that the Contractor should be permitted to extend the time for completion as provided in Paragraph 8.3, the Progress Schedule shall be adjusted accordingly, and the dollar value of Work to be completed as of the first of each month shall be recalculated.

I. Delete Subparagraph 3.12.7 and substitute the following:

3.12.7 By approving and submitting Shop Drawings, Product Data, Samples and similar submittals, the Contractor thereby represents that the Contractor has or will have determined and verified all dimensions (including field dimensions), quantities, relationship to existing work, coordination with work to be installed later, coordination with information on previously accepted Shop Drawings, Product Data, Samples and similar submittals, and verification of compliance with an requirements of the Contract Documents. The accuracy of such information is the responsibility of the Contractor. In reviewing Shop Drawings, Product Data, Samples, and similar submittals, the Architect shall be entitled to rely upon the Contractor's representation that such information is correct and accurate.

J. Insert the following at the end of Subparagraph 3.12.9:

"Unless such written notice has been given, the Architect's approval of a resubmitted Shop Drawing, Product Data, Sample, or similar submittal shall not constitute approval of any changes not requested on the prior submittal."

K. Delete Subparagraph 3.12.11 and substitute the following:

3.12.11 When professional certification of performance criteria of materials, systems or equipment is required by the Contract Documents, the Owner shall be entitled to rely upon such certifications, and neither the Owner nor the Architect shall be expected to make any independent examination with respect thereto.

additional drawings or instructions, the Contractor shall give the notice provided in Subparagraph 4.3.7."

H. In Subparagraph 4.3.3 ., in the first sentence change "21 days" to "7 days".

At the end of the second sentence in Subparagraph 4.3.3, add the following:

"within 7 working days and quantification of the claims made within 15 working days."

Delete the last sentence in Subparagraph 4.3.3 and substitute the following:

"Any change or addition to a previously made claim shall be made by timely written notice in accordance with this Subparagraph 4.3.3."

I. In Subparagraph 4.3.4, in the first sentence delete the words "including arbitration".

K. In Subparagraph 4.3.6 change "21 days" to the following:

"seven (7) days".

After the fourth sentence add the following:

Written notice of the claim must be made within seven (7) working days with quantification of the claim submitted within 15 working days.

Delete Subparagraph 4.3.7 and substitute the following:

4.3.7 If the Contractor claims that any acts or omissions of the Owner or the Architect, including any instructions or orders, whether oral, written, by Drawings, or otherwise, involve extra cost or time, and the Contractor has not received a written acknowledgment by the Owner or Architect that extra payment will be made or time extended on account thereof, the Contractor shall promptly (but within seven (7) days) so notify the Architect in writing of such claim and shall not proceed with the Work relating to such claim until the Contractor has received a further written order to proceed in accordance with Paragraph 4.4 except, as provided in Paragraph 10.3, in the case of an emergency affecting life or property. No claim by the Contractor on account of such acts, omissions, instructions or orders shall be valid unless the Contractor has so notified the Architect, before proceeding, and has received the further written order to proceed.

7.1.2.1 The Architect may issue Bulletins. A Bulletin is either:

a) a clarification to the Contract Documents, in accordance with Subparagraph 4.212, or

b) a minor change in the Work in accordance with paragraph 7.4, or

c) proposed extra Work resulting in an adjustment to the Contract Sum and/or Contract Time.

Upon receipt of a Bulletin, the Contractor shall review it promptly; if a Bulletin is determined by the Contractor to be a clarification to the Contract Documents or a minor change in the Work, the Contractor shall proceed in accordance with Paragraph 7.4. If the Bulletin is determined by the Contractor to be extra Work resulting in an adjustment to the Contract Sum and/or Contract Time, the Contractor shall not proceed with the Work described in the Bulletin, unless specifically authorized to do so in writing, but shall submit a detailed estimate in accordance with new Subparagraphs 7.3.1.1 and 7.3.3.

C. Add Subparagraph 7.1.5 as follows:

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. Where major cost items are Subcontracts, they shall be itemized also. In no case will a change involving over $600.00 be approved without such itemization.

D. Delete Subparagraph 7.2.2.

E. Add Clause 7.3.1.1 as follows:

7.3.1.1 Upon request of the Owner or the Architect, the Contractor shall without cost to the Owner submit to the Architect, in such form as the Architect may require, an accurate written estimate of the cost of any proposed extra Work or change. The estimate shall indicate the quantity and unit cost of each item of materials, and the number of hours of work and hourly rate for each class of labor, as well as the description and amounts of all other costs chargeable under the terms of this Article. Unit labor costs for the installation of each item of materials shall be shown if required by the Architect. The Contractor shall promptly revise and resubmit such estimate if the Architect determines that it is not in compliance with the requirements of this Article, or that it contains errors of fact or mathematical errors. If required by the Architect, in order to establish

Change Directives or Change Orders effect a single change, Percentage shall be calculated on the cumulative net increase or decrease in Cost, if any.

1. Percentage for a Sub-subcontractor shall be 10 percent of any net increase or decrease of Cost of any Work performed by the Sub-subcontractor's own forces plus 5 percent of any aggregate net increase in Cost of any work performed for the Sub-subcontractor by other contractors.

2. Percentage for a Subcontractor shall be 10 percent of any net increase or decrease of Cost of any Work performed by the Subcontractor's own forces plus 5 percent of any aggregate net increase in Cost of any work performed for the Subcontractor by other Subsubcontractors.

3. The Percentage for the Contractor shall be 10 percent of any net increase or decrease of Cost of any Work performed by the Contractor's own forces plus 5 percent of any net increase or decrease in the Cost for all other Work covered by the change.

7.3.3.3 If the Owner elects to determine the cost of the Work as provided in method (a) using unit prices stated in the Contract Documents or subsequently agreed upon, the unit prices shall be subject to Subparagraph 7.1.4. Notwithstanding the inclusion of unit prices in the Contract Documents, it shall be the Owner's option to require the Cost of any given change to be determined by one of the other methods stated in 7.3.3. If the owner elects to determine Cost of the change work by unit prices and the nature of the work is such that its extent cannot readily be measured after the completion of such work or any subsequent work, the Contractor shall keep daily records, available at all times to the Architect for inspection, of the actual quantities of such work put in place, and delivery receipts or other adequate evidence, acceptable to the Architect, indicating the quantities of materials delivered to the site for use in such unit price work, and distinguishing such from other similar material delivered for use in work included in the base Contract Sum. If so required by the Architect, materials for use in unit price work shall be stored apart from all other materials on the Project.

7.3.3.4 If the Owner elects to determine the cost of the Work as provided in methods (c) or (d) of Subparagraph 7.3.3 or if the method of determining the cost has not been established before the work is begun, the Contractor shall keep detailed daily records of labor and materials costs applicable to the work.

"and shall be revised if later found by the Architect to be inaccurate."

Add after the word"schedule" in the last sentence of Subparagraph 9.2.1:

"shall be coordinated with the progress schedule and".

C. Delete the first twelve words of the first sentence of Subparagraph 9.3.1 and substitute "At the time or times established in the Agreement". After the first sentence of Subparagraph 9.3. 1, add "The format and number of copies of such Applications for Payment shall be as directed by the Architect".

D. Delete Clause 9.3.1.1 and change Subparagraph 9.3.1.2 to 9.3.1.1

E. Add Subparagraphs 9.3.1.2, 9.3.1.3, as follows:

9.3.1.2 The Owner will pay 90 percent of the amount due the Contractor on account of progress payments.

9.3.1.3 The Owner shall make Progress Payments and Final Payment within 30 days of application date.

F. Add Subparagraph 9.3.4 as follows:

9.3.4 Each Application for Payment or periodic estimate requesting payment shall be accompanied by a waiver of liens from each Subcontractor and Contractor. Such waiver shall be in a form acceptable to the Owner.

G. In Subparagraph 9.5. 1, at the end of item 2. add the words:

"for which the Contractor is not entitled to a Claim as provided herein or which are not covered by insurance".

In Subparagraph 9.5.1, change item 6. and add new items 8. and 9. as follows:

"6. reasonable evidence that the Work will not be completed within the Contract Time,"

"8. a lien or attachment is filed contrary to Subparagraph 4.5.9; or

9. failure of mechanical trade or electrical trade subcontractors to comply with mandatory requirements for maintaining record drawings. The Contractor shall check record drawings each month. Written confirmation that the record drawings are current will be required by the Architect before approval of the

assigned to them in such Certificate.

Delete Subparagraph 9.9.1 and substitute the following:

9.9.1 The Owner may occupy or use any completed or partially completed portion of the Work at any stage. Such partial occupancy or use may begin whether or not the portion is substantially complete, provided that the respective responsibilities of the Owner and Contractor with respect to payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work, insurance, indemnification, correction of the Work, and warranties shall be established by agreement of the Owner and Contractor or, absent such agreement shall be determined by the Architect subject to the right of either party to contest such determination.

Delete the second sentence in Subparagraph 9.10.2 and substitute the following:

"If the Contractor fails to furnish such releases or waivers as the Owner reasonably requires to satisfy the Owner that there are no outstanding liens, the Owner may require the Contractor, as a condition of final payment and at the Contractor's expense, to furnish a bond satisfactory to the Owner to indemnify the Owner against any such liens."

At the end of Subparagraph 9.10.2 add the following:

"Final payment for a given Work Category constituting the entire unpaid balance for the Subcontract amount may be paid by the Owner to the Contractor following receipt of both the final Certificate for Payment from the Architect and the Final Lien Waiver from the Subcontractor and the Contractor. The Final Lien Waiver shall be submitted by the Subcontractor and Contractor on the form acceptable to the Owner. Final payments to the Subcontractor shall be made by Contractor after payment has been received by the Contractor.

P. Add Paragraph 9.11 as follows:

9.11 STORAGE OF MATERIALS OFF SITE

9.11.1 The Contractor, his Subcontractors, and Sub-subcontractors shall obtain prior written approval from the Owner for permission to store materials to be incorporated in the Work, for which Progress Payments will be requested, at off-site locations. Any and all charges for storage, including insurance, shall be borne solely by the Contractor. Before approval, Owner will require proper proof of insurance naming the Owner as an additionally insured party, and letter in which is furnished:

and Architect shall then proceed in the same manner described in Subparagraph 10.1.2. The Owner shall be responsible for obtaining the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to verify that it has been rendered harmless.

D. Delete the word "and" at the end of the Clause 10.2.1.2.

E. Add the word "and" to the end of the Clause 10.2.1.3.

F. Add Clause 10.2.1.4 as follows:

10.2.1.4 Any other property of the Owner, whether or not forming part of the Work, located at the site or adjacent thereto in areas to which the Contractor has access.

G. In Subparagraph 10.2.5, in two places after the word "10.2.1.3", add the words ", and 10.2.1.4".

H. Add Subparagraphs 10.2.8 through 10.2.11 as follows:

10.2.8 During the progress of the Work and at all times prior to the date of Substantial Completion or occupancy of the Work by the Owner, whichever is earlier, the Contractor shall provide temporary heat, ventilation, and enclosure, adequate to permit the Work to proceed in a timely fashion, and to prevent damage to completed Work or Work in progress, or to materials stored on the premises. The permanent heating and ventilation systems may be used for these purposes when available.

ARTICLE 11 INSURANCE AND BONDS

A. Delete Subparagraph 11.1.2 and substitute the following:

Prior to commencement of any work under this Contract and until completion and final acceptance of the work, the Contractor and each and every Subcontractor of the Contractor shall, at its sole expense, maintain the following insurance on its own behalf, and furnish to the City of Portland, certificates of insurance evidencing same and reflecting the effective date of such coverage as follows:

The term "Contractor & Subcontractor" as used in this insurance rider, shall mean and include Contractors and Subcontractors of every tier.

A. Workers Compensation and Occupational Disease Insurance, statutory

waive their rights of subrogation against the City of Portland and all other indemnities named in the Contract.

J. Should the Contractor or a Subcontractor engage a Subcontractor, the same conditions will apply under this contract to each Subcontractor, however, the Subcontractor shall be required to maintain limits of liability not less than Three Hundred Thousand Dollars ($300,000) per occurrence and in the aggregate, with said limits applicable on a per project basis, or such greater limits as may be required by the Contractor.

K. Certificates of Liability for each policy are required to be provided to the City before work is commenced. City of Portland should appear as Additional Insured in all cases and the certificate should provide for notice of cancellation, material change or non-renewal to the City at least thirty (30) days prior to the cancellation, change or non-renewal.

ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

A. At the end of Subparagraph 12.2.2 add the following:

"For the purpose of establishing the guarantee period, the Date of Substantial Completion shall be deemed to occur when Certificates of Substantial Completion have been issued for all Work. In the case of Owner use and/or occupancy of a portion of the Work (including mechanical or electrical equipment) prior to completion of this phase of the Project, the guarantee period for said portion of Work shall commence upon the date of Owner occupancy."

ARTICLE 13 MISCELLANEOUS PROVISIONS

A. Add Subparagraph 13.2.2 as follows:

B. Delete Subparagraph 13.4.2 and substitute the following:

13.4.2 No consent or waiver, express or implied, by the Owner or the Architect to, or of, any breach of any covenant, condition or duty of the Contractor shall be construed as a consent to or waiver of any other breach of the same or any other covenant, condition or duty.

C. In the last sentence of Subparagraph 13.5.2, after the word "costs" add the following: "and changes to the Contract Time".

D. Delete Subparagraph 13.5.4 and substitute the following:

B. In Subparagraph 14.2.2 in the first sentence delete the words "above" and "upon certification by the Architect that sufficient cause exists to justify such action".

In Subparagraph 14-2.2 in the first line after the word "exist" add the following:

"as stated in Subparagraph 14.2. 1, ".

C. Delete Paragraph 14.3 and substitute the following:

14.3 TERMINATION BY THE OWNER FOR CONVENIENCE

14.3.1 The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause.

14.3.2 Upon receipt of written notice from the owner of such termination for the Owner's convenience, the Contractor shall:

1. Cease operations as directed by the Owner in such notice;

2. Take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and

3. Except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

14.3.3 In case of such termination for the Owner's convenience, the Contractor shall be entitled to receive payment from the Owner on the same basis provided in Subparagraph 14.1.2.

Add ARTICLE 15 - OTHER CONDITIONS OF THE CONTRACT

15.1 Typographical errors in application for Payments or Change Orders shall not be grounds for additional payments.

15.2 If Section 952 of the Omnibus Reconciliation Act of 1980 is found to apply to this contractual relationship, it is agreed that the following Access to Records provision applies.

1. 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

CONTRACTS $250,000-$500,000

Prior to commencement of any work under this Contract and until completion and final acceptance of the work, the Contractor and each and every Subcontractor of the Contractor shall, at its sole expense, maintain the following insurance on its own behalf, and furnish to the City of Portland, certificates of insurance evidencing same and reflecting the effective date of such coverage as follows:

The term "Contractor & Subcontractor" as used in this insurance rider, shall mean and include Contractors and Subcontractors of every tier.

A. Workers Compensation and Occupational Disease Insurance, statutory coverage, with $300,000 limit for Employer's Liability coverage.

B. Commercial General Liability with a combined Bodily Injury and Property Damage limit of $1,000,000. Coverage should include Contractual Liability, Broad Form Property Damage, "X, C&U" coverage where applicable, Personal Injury Liability, Independent Contractors. All coverage to be provided on an "occurrence" basis with licensed, admitted carriers approved by the City.

C. Commercial Automobile Liability, including all owned, non-owned and hired vehicles, with a combined limit of $1,000,000 for Bodily Injury or Property Damage.

D. The certificates for above insurance shall each contain the provision that:

This insurance will not be canceled, materially changed or not renewed without a thirty (30) day advance written notice to the City of Portland, Corporation Counsel, 389 Congress Street, Portland, ME 04101.

E. The amount of insurance contained in aforementioned insurance coverages, shall not be construed to be a limitation of the liability on the part of the Contractor or any of its Subcontractors.

F. The Contractor shall file certificates of insurance prior to the commencement of work and/or payment with the City of Portland which shall be subject to the City of Portland and approval of adequacy of protection and the satisfactory character of the Insurer. The carrying of the insurance described shall in no way be interpreted as relieving the Contractor of any responsibility for liability under this Contract.

G. Prior to commencement of any work under this Contract and until completion and final acceptance of the work, the Contractor at its sole expense will provide and maintain the following insurance for the City of Portland, itself, and Subcontractors performing work or services in connection with the project.

AGREEMENT BETWEEN THE

CITY OF PORTLAND

AND

_____

THIS AGREEMENT is made this day of , 1999, by and between the CITY OF PORTLAND, a body politic and corporate having a place of business in the County of Cumberland, State of Maine (hereinafter "CITY") and _____ _____, with a mailing address of _____ _____ (hereinafter "CONTRACTOR").

W I T N E S S E T H:

WHEREAS, the CITY did advertise for Requests for Bids by Bid #8799 entitled MAINTENANCE GARAGE (A PRE-ENGINEERED WOOD BUILDING) at the Riverside Municipal Golf Course; and

WHEREAS, the CONTRACTOR did under date of _____ , submit a bid for such work; and

WHEREAS, after due consideration of all of the bids the CITY did award the bid to the CONTRACTOR;

NOW, THEREFORE, in consideration of the mutual promises made by each party to the other, the parties covenant and agree as follows:

1. SCOPE OF WORK.

The CONTRACTOR will furnish the materials, supplies, equipment and labor (hereinafter the "Work") required to construct and complete the MAINTENANCE GARAGE project, all as more fully set forth in:

i. Specifications:

ii. Drawings:

after giving the CONTRACTOR, and its surety, seven (7) days' written notice, terminate the employment of the CONTRACTOR and take possession of the Premises and of all materials, tools and appliances thereon and finish the Work by whatever method it may deem expedient. In such case, the CONTRACTOR shall not be entitled to receive any further payment until Work is finished. If the unpaid balance of the Contract amount shall exceed the expense of finishing the Work, including compensation for additional architectural, managerial and administrative services, such excess shall be paid to the CONTRACTOR. If such expense shall exceed such unpaid balance, the CONTRACTOR shall pay the difference to the CITY.

5. BONDS.

The CONTRACTOR shall furnish to the CITY, upon execution of the Contract, a Contract Performance Bond and a Contract Labor and Material Payment Bond each for the full amount of the Contract and issued by a surety company or surety companies authorized to do business in the State of Maine and approved by the CITY.

The Bonds shall remain in effect for one (1) year after final acceptance of the Work, and protect the CITY's interest in the one (1) year guaranty of workmanship and materials, and also shall insure settlement of claims, for the payment of all bills for labor, materials and equipment by the CONTRACTOR.

Any Mechanic's Lien or any other lien which may be filed against the Premises which are the subject of this Contract by reason of the Work described herein shall be defended (by counsel reasonably accepted to the CITY) and promptly discharged by the CONTRACTOR at its own expense. If the CONTRACTOR should fail, either to defend the CITY against the lien or to discharge it, then the CITY may do so at the CONTRACTOR's expense. In the event of such an undertaking by the CITY, the CONTRACTOR will promptly reimburse the CITY for all of its costs and expenses in

CONTRACTOR, any subcontractor, anyone directly or indirectly employed by any of them, or anyone for whose act any of them may be liable, regardless of whether or not it is caused in part by a party indemnified hereunder.

CONTRACTOR hereby expressly agrees that it will defend, indemnify and hold the CITY harmless from any and all claims made or asserted by CONTRACTOR's agents, servants or employees arising out of CONTRACTOR's activities under this Contract. For this purpose, CONTRACTOR hereby expressly waives any and all immunity it may have under Maine's Workers Compensation Act in regard to such claims made or asserted by CONTRACTOR's agents, servants or employees. The indemnification provided under this paragraph shall extend to and include any and all costs incurred by the CITY to answer, investigate, defend and settle all such claims, including, but not limited to, the CITY's costs for attorneys fees, expert and other witness fees, the cost of investigators, and payment in full of any and all judgments rendered in favor of CONTRACTOR's agents, servants or employees against the CITY in regard to claims made or asserted by such agents, servants or employees.

8. INSURANCE.

CONTRACTOR shall provide all insurance required by the General and Supplemental Conditions to this Contract and/or Addenda to the Bid Specifications.

9. PAYMENT.

a. CONTRACTOR agrees to perform the Work required by this Agreement for the Contract Sum of _____ Dollars ($_____).

b. All applications for payment and processing of payment shall be in accordance with the terms of the General Conditions to this Contract.

c. CITY shall withhold ten percent (10%) of each invoice amount as retainage. The retainage shall be released as outlined in the General Conditions.

shall remove all rubbish from and about the Project, all tools, scaffolding and surplus materials, and shall leave the Work "broom clean" or its equivalent, unless more exactly specified. In case of the failure to comply by the CONTRACTOR, the CITY may perform the clean up and deduct the costs from any monies due the CONTRACTOR.

14. ALTERNATE DISPUTE RESOLUTION.

If, in the performance of the Contract, there should arise a dispute between the CITY and the CONTRACTOR which can not be settled, then any such dispute shall be resolved as provided in the General Conditions to this Contract.

15. TERMINATION FOR CONVENIENCE.

The CITY shall have the right to terminate this Contract at any time for its convenience on prior written notice to CONTRACTOR. If Contract should be terminated by CITY for such convenience, the CITY shall pay CONTRACTOR for all Work performed and all materials purchased, pursuant to this Contract, prior to the receipt of such notice.

16. TERMINATION FOR CAUSE.

The CITY may terminate this Contract for cause by written notice to the CONTRACTOR. In the event of such termination, CONTRACTOR shall not be entitled to any further payment under this Contract from the date of receipt of said notice.

The successful proposer shall furnish the City with a Contract Performance Bond and a Labor and Materials Payment Bond, each in the amount of one hundred percent (100%) of the awarded contract price, guaranteeing one hundred percent performance of the contract agreement, including the guaranteed period and free of any and all liens, attachments and encumbrances. All bonds shall comply with the requirements of Maine state law.

The City shall require the contractor to furnish Waivers of Lien for Labor and/or Materials, for and in the amount of the contract, guaranteeing payment in full for all labor or materials used or required in connection with the awarded contract.

The successful bidder shall agree to save the City harmless from all losses, costs or damages caused by his/her acts or those of his/her agents, and, before signing the contract, will produce evidence satisfactory to the City's Corporation Counsel that he/she has secured the insurance coverage in the amounts shown in the attached two page section entitled **CONTRACTS $250,000 - $500,000**.

The successful proposer shall defend, indemnify and shall agree to hold the City harmless from all losses, costs or damages caused by his/her acts or those of his/her agents. The firm shall be responsible for any and all injury or damages as a result of any services rendered under the terms and conditions of the contract. The firm also agrees to hold the City harmless for any negligent act or omission committed by any subcontractors or other person employed by, or under the supervision of the firm, under the terms of the contract.

Work shall be conducted in an orderly manner and all work shall comply with all applicable federal, OSHA, State, State of Maine department(s) and State of Maine board(s) and local laws and regulations, including but not limited to the Americans with Disabilities Act as it specifically applies to this equipment and the place of its use. Contractor shall be responsible for the protection and safety of the public, as well as their's and the City's work force. Waste materials must be cleared and removed at the end of each work day.

The City disclaims any and all responsibility for injury to contractors, their agents or others while examining the job site or at any other time.

The City of Portland, Maine, is exempt from the State of Maine *Sales and Use Tax* and from all Federal Excise taxes. Each bidder shall take this exception into account in calculating his bid price for the work.

SECTION 01027

APPLICATION FOR PAYMENT

PART 1-GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section specifies administrative and procedural requirements governing the Contractor's Applications for Payment.

1.3 SCHEDULE OF VALUES

A. Format and Content: Use the Project Manual Table of Contents as a guide to establish the format for the Schedule of Values.

1. Identification: Include the following Project identification on the Schedule of Values:

    a. Project name and location.

    b. Name of the Architect.

    c. Contractor's name and address.

    d. Date of submittal.

2. Arrange the Schedule of Values in a tabular form with separate columns to indicate the following for each item listed:

    a. Generic name.

    b. Related Specification Section.

    c. Name of subcontractor.

    d. Name of manufacturer or fabricator.

    e. Name of supplier.

    f. Change Orders (numbers) that have affected value.

B. Payment Application Times: Each progress payment date is as indicated in the Agreement. The period of construction Work covered by each Application or Payment is the period indicated in the Agreement.

C. Payment Application Forms: Use AIA Document G 702 and Continuation Sheets G 703 as the form for the Application Payment.

D. Application Preparation: Complete every entry on the form, including notarization and execution by person authorized to sign legal documents on behalf of the Owner. Incomplete applications will be returned without action.

    1. Entries shall match data on the Schedule of Values and Contractor's Construction Schedule. Use updated schedules if revisions have been made.

    2. Include amounts of Change orders and Construction Change Directives issued prior to the last day of the construction period covered by the application.

E. Transmittal: Submit 3 executed copies of each Application for Payment to the Architect by means ensuring receipt a minimum 24 hours prior to the requisition walkthrough. One copy shall be complete, including waivers of lien and similar attachments.

    1. Transmit each copy with a transmittal form listing attachments, and recording appropriate information related to the application in a manner acceptable to the Architect.

G. Waivers of Mechanics Lien: With each Application for Payment submit waivers of mechanic lien from every entity who may lawfully be entitled to file a mechanics lien arising out of the Contract, and relates to the Work covered by the payment.

    1. Submit partial waivers on each item for the amount requested, prior to deduction for retainage, on each item.

    2. When an application shows completion of an item, submit final or full waivers.

    3. The Owner reserves the right to designate which entities involved in the Work must submit waivers. All major sub-contractors must submit lien waivers at a minimum.

    4. Waiver Forms: Submit waivers of lien on forms, and executes in a manner, acceptable to the Owner.

I. Application for Payment at Substantial Completion; Following issuance of the Certificate of Substantial Completion, submit an Application for Payment;

7. Proof that taxes, fees, and similar obligations have been paid.
8. Removal of temporary facilities and services.
9. Removal of surplus materials, rubbish and similar elements.
10. Change of door/locks to Owner access.

PART 2-PRODUCTS (Not Applicable)

PART 3-EXECUTION (Not Applicable)

END OF SECTION

SECTION 01040

PROJECT COORDINATION

PART 1-GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this section.

1.2 PROJECT DESCRIPTION

A. This Section specifies administrative and supervisory requirements necessary for Project coordination including, but not necessary limited to:

1. Coordination.
2. Administrative and supervisory personnel.
3. General installation provisions.
4. Cleaning and protection.

B. Progress meetings, coordination meetings and pre-installation conferences are included in Section "Project Meetings".

1.3 COORDINATION

A. Coordination: The General Contractor is entirely responsible for coordination of all construction activities. Coordinate construction activities included under various Sections of these Specifications to assure efficient and orderly installation of each part of the Work. Coordinate construction operations included under different Sections of the Specifications that are dependent upon each other for proper installation, connection, and operation.

1. The General Contractor shall thoroughly review all aspects of coordination between the various trades involved well in advance of installation and make adjustments to locations of work if any conflicts are indicated in the drawings. Inform the Architect immediately if any conflicts are noted in order to provide a relocation scheme at no additional cost to the owner.

A. Coordination Drawings: Prepare and submit coordination Drawings where close and careful coordination is required for installation of products and materials fabricated off-site by separate entities, and where limited space availability necessitates maximum utilization of space for efficient installation of different components.

1. Show the interrelationship of components shown on separate Shop Drawings.

2. Indicate required installation sequences.

3. Comply with requirements contained in Section "Submittals".

4. Refer to Division-15 Section "Basic Mechanical Requirements." And Division-16 Section "Basic Electrical Requirements" for specific coordination Drawing requirements for mechanical and electrical installations.

B. Staff Names: Within 15 days of Notice to Proceed, submit a list of the Contractor's principal staff assignments, including the Superintendent and other personnel in attendance at the site; identify individuals, their duties and responsibilities; list their addresses and telephone numbers.

1. Post copies of the list in the Project meeting room, the temporary field office, and by each temporary telephone.

PART 2-PRODUCTS (Not Applicable).

PART-3 EXECUTION

3.1 GENERAL INSTALLATION PROVISIONS

A. Inspection of Conditions: Require the Installer of each major component to inspect both the substrate and conditions under which Work is to be performed. Do not proceed until unsatisfactory conditions have been corrected in an acceptable manner.

B. Manufacturer's Instructions: Comply with the manufacturer's installation instructions and recommendations, to the extent that those instructions and recommendations are more explicit or stringent than requirements contained in Contract Documents.

C. Inspect materials or equipment immediately upon delivery and again prior to installation. Reject damaged and defective items.

D. Provide attachment and connection devices and methods necessary for securing Work. Secure work true to line and level. Allow for expansion and building movements.

7. Solvents.
8. Chemicals.
9. Light.
10. Radiation.
11. Puncture.
12. Abrasion.
13. Heavy traffic.
14. Soiling, staining, and corrosion.
15. Bacteria.
16. Rodent and insect infestation.
17. Combustion.
18. Electrical current.
19. Improper lubrication.
20. Unusual wear or otherwise misuse.
21. Contact between incompatible materials.
22. Destructive testing.
23. Misalignment.
24. Excessive weathering.
25. Unprotected storage.
26. Improper shipping or handling.
27. Theft.
28. Vandalism.

END OF SECTION

SECTION 01045

CUTTING AND PATCHING

PART 1-GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

1.2 Summary

A. This section specifies administrative and procedural requirements for cutting and patching.

B. Refer to other Sections for specific requirements and limitations applicable to cutting and patching individual parts of the Work.

1. Requirements of this Section apply to mechanical and electrical installations. Refer to Division-15 and Division-16 Sections for other requirements and limitations applicable to cutting and patching mechanical and electrical installations.

C. Demolition of selected portions of the building for alterations is included in Section "Selective Demolition".

1.3 SUBMITTALS

A. Cutting and Patching Proposal: Where approval of procedures for cutting and patching is required before proceeding, submit a proposal describing procedures describing procedures well in advance of the time cutting and patching will be performed and request approval to proceed. Include the following information, as applicable, in the proposal:

1. Where cutting and patching involves addition of reinforcement to structural elements, submit details and engineering calculations to show how reinforcement is integrated with the original structure.

2. Approval by the Architect to proceed with cutting and patching does not waive the Architect's right to later require complete removal and replacement of a part of the work found to be unsatisfactory.

1.4 QUALITY ASSURANCE

A. Requirements for Structural Work: Do not cut and patch structural elements in a manner that would reduce their load-carrying capacity or load-deflection ratio.

3.3 PERFORMANCE

A. General: Employ skilled workmen to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time and complete without delay.

1. Cut existing construction to provide for installation of other components or performance of other construction activities and the subsequent fitting and patching required to restore surfaces to their original condition.

B. Cutting: Cut existing construction using methods least likely to damage elements to be retained or adjoining construction. Where possible review proposed procedures with the original installer; comply with the original installer's recommendations.

1. In general, where cutting is required use hand or small power tools designed for sawing or grinding, not hammering and chopping. Cut holes and slots neatly to size required with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.

2. To avoid marring existing finished surfaces, cut or drill from the exposed or finished side into concealed surfaces.

3. Cut through concrete and masonry using a cutting machine such as a carborundum saw or diamond core drill.

4. Comply with requirements of applicable Sections of Division-2 where cutting and patching requires excavating and backfilling.

5. By-pass utility services such as pipe or conduit, before cutting, where services are shown or required to be removed, relocated or abandoned. Cut-off pipe or conduit in walls or partitions to be removed. Cap, valve or plug and seal the remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after by-passing and cutting.

C. Patching: Patch with durable seams that are as invisible as possible. Comply with specified tolerances.

1. Where feasible, inspect and test patched areas to demonstrate integrity of the installation.

2. Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.

SECTION 01300

SUBMITTALS

PART 1-GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This section specifies administrative and procedural requirements for submittals required for performance of the Work, including:

1. Contractor's construction schedule.
2. Submittal schedule.
3. Daily construction reports.
4. Shop Drawings.
5. Product Data.
6. Samples.
7. Material safety data sheets.

B. Administrative Submittals: Refer to other Division-1 Sections and other Contract Documents for requirements for administrative submittals. Such submittals include, but are not limited to:

1. Permits.
2. Applications for payment.
3. Performance and payment bonds.
4. Insurance certificates.
5. List of Subcontractors.

1.3 SUBMITTAL PROCEDURES

a. Submittal Number

b. Project name.

c. Date.

d. Name and address of Architect.

e. Name and address of Contractor.

f. Name and address of subcontractor.

g. Name and address of supplier.

h. Name of manufacturer.

i. Number and title of appropriate Specification Section.

j. Drawing number and detail references, as appropriate.

C. Submittal Transmittal: Package each submittal appropriately for transmittal and handling. Transmit each submittal from Contractor to Architect using a transmittal form. Submittals received from sources other than the Contractor will be returned without action.

1. On the transmittal record relevant information and requests for data. On the form, or separate sheet, record deviations from Contract Document requirements, including minor variations and limitations. Include Contractor's certification that information complies with Contract Document requirements.

1.4 CONTRACTOR'S CONSTRUCTION SCHEDULE

A. Bar-Chart Schedule: Prepare a fully developed, horizontal bar-chat type Contractor's construction schedule. Submit within 30 days of the date established for "Commencement of the Work".

1. Within each time bar indicate estimated completion percentage in 10 percent increments. As Work progresses, place a contrasting mark in each bar to indicate Actual Completion.

2. Prepare the schedule on a sheet, or series of sheets, of stable transparency, or other reproducible media, of sufficient width to show data for the entire construction period.

3. Secure time commitments for performing critical elements of the Work from parties involved. Coordinate each element on the schedule with other construction activities; include minor elements

comply with submittal data indicated. Post copies in the Project meeting room and field office.

1. When revisions are made, distribute to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in construction activities.

C. Schedule Updating: Revise the schedule after each meeting or activity, where revisions have been recognized or made. Issue the updated schedule concurrently with report of each meeting.

1.6 DAILY CONSTRUCTION REPORTS

A. Prepare a daily construction report, recording the following information concerning events at the site; and submit duplicate copies to the Architect at weekly intervals:

1. List of subcontractors at the site.
2. Approximate count of personnel at the site.
3. High and low temperature.
4. Accidents and unusual events.
5. Meetings and significant decisions.
6. Stoppages, delays, shortages, losses.
7. Orders and requests of governing authorities.
8. Change Orders received, implemented.
9. Partial Completions, occupancies.
10. Substantial Completions authorized.

1.7 SHOP DRAWINGS

A. Submit newly prepared information drawn to accurate scale. Highlight, encircle, or otherwise indicate deviations from the Contract Documents. Do not reproduce Contract Documents or copy standard information as the basis of Shop Drawings. Standard information prepared without specific reference to the Project is not considered Shop Drawings.

performance curves. Where Product Data must be specifically prepared because standard printed data is not suitable for use, submit as "Shop Drawings".

1. Mark each copy to show applicable choices and options. Where printed Product Data includes information on several products, some of which are not required, mark copies to indicate the applicable information. Include the following information:

    a. Manufacturer's printed information.

    b. Compliance with recognized trade association standards.

    c. Compliance with recognized testing agency standards.

    d. Application of testing agency labels and seals.

    e. Notation of dimensions verified by field measurements.

    f. Notation of coordination requirements.

2. Do not submit Product Data until compliance with requirements of the Contract Documents has been confirmed.

1.9 SAMPLES

A. Submit Samples for review of kind, color, pattern, and texture, for a final check of these characteristics with other elements, and for a comparison of these characteristics between final submittal and the actual components as delivered and installed.

    1. Where variation in color, pattern, texture, or other characteristics are inherent In the material or product represented, submit multiple units (not less than 3), that show approximate limits of the variations.

B. Submittals: Except for Samples illustrating assembly details, workmanship, fabrication, techniques, connections, operation and similar characteristics, submit 2 sets; one will be returned with the action taken.

C. Maintain sets of Samples, as returned, at the Project site, for quality comparisons throughout the course of construction.

D. Distribution of Samples: Prepare and distribute additional sets to subcontractors, manufacturers, fabricators, suppliers, installers, and others as required for performance of the Work. Show distribution on transmittal forms.

    1. Comply with submittal requirements to the fullest extent possible. Process transmittal forms to provide a record of activity.

SECTION 01500
TEMPORARY FACILITIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes requirements for construction facilities and temporary controls, including temporary utilities, support facilities, and security and protection.

B. Temporary utilities include, but are not limited to, the following:

1. Temporary electric power and light.
2. Temporary heat.
3. Ventilation.
4. Telephone service.
5. Sanitary facilities, including drinking water.

C. Support facilities include, but are not limited to, the following:

1. Field offices and storage sheds.
2. Temporary enclosures.
3. Temporary project identification signs and bulletin boards.
4. Waste disposal services.
5. Construction aids and miscellaneous services and facilities.

D. Security and protection facilities include, but are not limited to, the following:

1. Temporary fire protection.
2. Barricades, warning signs, and lights.
3. Environmental protection.

1.3 SUBMITTALS (Not Applicable)

1.4 QUALITY ASSURANCE

2. For safety barriers, sidewalk bridges, and similar uses, provide minimum 5/8-inch- (16-mm-) thick exterior plywood.

C. Tarpaulins: Provide waterproof, fire-resistant, UL-labeled tarpaulins with flame-spread rating of 15 or less. For temporary enclosures, provide translucent, nylon-reinforced, laminated polyethylene or polyvinyl chloride, fire-retardant tarpaulins.

D. Water: Provide potable water approved by local health authorities.

E. Open-Mesh Fencing: Provide 0.120-inch- (3-mm-) thick, galvanized 2-inch (50-mm) chainlink fabric fencing 6 feet (2 m) high with galvanized barbed-wire top strand and galvanized steel pipe posts, 1-1/2 inches (38 mm) I.D. for line posts and 2-1/2 inches (64 mm) I.D. for corner posts.

2.2 EQUIPMENT

A. General: Provide new equipment. If acceptable to the Architect, the Contractor may use undamaged, previously used equipment in serviceable condition. Provide equipment suitable for use intended.

B. Water Hoses: Provide 3/4-inch (19-mm), heavy-duty, abrasion-resistant, flexible rubber hoses 100 feet (30 m) long, with pressure rating greater than the maximum pressure of the water distribution system. Provide adjustable shutoff nozzles at hose discharge.

C. Electrical Outlets: Provide properly configured, NEMA-polarized outlets to prevent insertion of 110- to 120-Volt plugs into higher voltage outlets. Provide receptacle outlets equipped with ground-fault circuit interrupters, reset button, and pilot light for connection of power tools and equipment.

D. Electrical Power Cords: Provide grounded extension cords. Use hard-service cords where exposed to abrasion and traffic. Provide waterproof connectors to connect separate lengths of electric cords if single lengths will not reach areas where construction activities are in progress. Do not exceed safe length-voltage ratio.

E. Temporary Offices: Provide prefabricated or mobile units or similar job-built construction with lockable entrances, operable windows, and serviceable finishes. Provide heated and air-conditioned units on foundations adequate for normal loading.

F. Temporary Toilet Units: Provide self-contained, single-occupant toilet units of the chemical, aerated recirculation, or combustion type. Provide units properly vented and fully enclosed with a glass-fiber-reinforced polyester shell or similar nonabsorbent material.

D. Temporary Lighting: Provide temporary lighting with local switching as necessary for a safe work environment.

    1. Install and operate temporary lighting that will fulfill security and protection requirements without operating the entire system. Provide temporary lighting that will provide adequate illumination for construction operations and traffic conditions.

E. Temporary Telephones: Provide temporary telephone service throughout the construction period for all personnel engaged in construction activities. Install telephone on a separate line for each temporary office and first-aid station.

    1. Separate Telephone Lines: Provide additional telephone lines for the following:

        a. Where an office has more than 2 occupants, install a telephone for each additional occupant or pair of occupants.

        b. Provide a dedicated telephone line for a fax machine in the field office.

        c. At each telephone, post a list of important telephone numbers.

F. Sanitary facilities include temporary toilets, wash facilities, and drinking-water fixtures. Comply with regulations and health codes for the type, number, location, operation, and maintenance of fixtures and facilities. Install where facilities will best serve the Project's needs.

G. Sewers and Drainage: If sewers are available, provide temporary connections to remove effluent that can be discharged lawfully. If sewers are not available or cannot be used, provide drainage ditches, dry wells, stabilization ponds, and similar facilities. If neither sewers nor drainage facilities can be lawfully used for discharge of effluent, provide containers to remove and dispose of effluent off-site in a lawful manner.

    1. Filter out excessive amounts of soil, construction debris, chemicals, oils, and similar contaminants that might clog sewers or pollute waterways before discharge.

H. Temporary Heat: Provide temporary heat required by construction activities for curing or drying of completed installations or for protection of installed construction from adverse effects of low temperatures or high humidity. Select safe equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce the ambient condition required and minimize consumption of energy

public and persons seeking entrance to the Project. Support on posts or framing of preservative-treated wood or steel. Do not permit installation of unauthorized signs.

1. Project Identification Signs: Engage an experienced sign painter to apply graphics. Provide a sign Complying with the details below:

    a. Size 36" x 60"

    b. mount at entrance to building in a location approved by the owner.

    c. Owner's name.

    d. Project name.

    e. Architect's name.

    f. Contractor's name.

2. Temporary Signs: Prepare signs to provide directional and warning information to construction personnel and visitors.

E. Collection and Disposal of Waste: Collect waste from construction areas and elsewhere daily. Comply with requirements of NFPA 241 for removal of combustible waste material and debris. Enforce requirements strictly. Do not hold materials more than 7 days during normal weather or 3 days when the temperature is expected to rise above 80 deg F (27 deg C). Handle hazardous, dangerous, or unsanitary waste materials separately from other waste by containerizing properly. Dispose of material lawfully.

F. Stairs: Until permanent staris are available, provide temporary stairs where ladders are not adequate. Cover finished, permanent stairs with a protective covering of plywood or similar material so finishes will be undamaged at the time of acceptance.

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

A. Except for use of permanent fire protection as soon as available, do not change over from use of temporary security and protection facilities to permanent facilities until Substantial Completion, or longer, as requested by the Architect.

B. Temporary Fire Protection: Until fire-protection needs are supplied by permanent facilities, install and maintain temporary fire-protection facilities of the types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 10 "Standard for Portable Fire Extinguishers" and NFPA 241 "Standard for Safeguarding Construction, Alterations, and Demolition Operations."

A. Supervision: Enforce strict discipline in use of temporary facilities. Limit availability of temporary facilities to essential and intended uses to minimize waste and abuse.

B. Maintenance: Maintain facilities in good operating condition until removal. Protect from damage by freezing temperatures and similar elements.

C. Termination and Removal: Unless the Architect requests that it be maintained longer, remove each temporary facility when the need has ended, when replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with the temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.

1. Materials and facilities that constitute temporary facilities are the Contractor's property. The Owner reserves the right to take possession of project identification signs.

2. At Substantial Completion, clean and renovate permanent facilities used during the construction period including, but not limited to, the following:

    a. Replace air filters and clean inside of ductwork and housings.

    b. Replace significantly worn parts and parts subject to unusual operating conditions.

    c. Replace lamps burned out or noticeably dimmed by hours of use.

    d. Clean and vacuum existing smoke and heat detectors which may have been affected by construction dust.

END OF SECTION 01500

SECTION 01700

PROJECT CLOSEOUT

PART 1-GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section specifies administrative and procedural requirements for project close out, including but not limited to:

1. Inspection procedures.
2. Project record document submittal.
3. Operating and maintenance manual submittal.
4. Submittal of warranties.
5. Final cleaning.

B. Closeout requirements for specific construction activities are included in the appropriate Sections in Division-2 through-16.

1.3 SUBMITTAL COMPLETION

A. Preliminary Procedures: Before requesting inspection for certification of Substantial Completion, complete the following. List exceptions in the request.

1. In the application for Payment that coincides with, or first follows, the date Substantial Completion is claimed, show 100 percent completion for the portion of the Work claimed as substantially complete. Include supporting documentation for the completion as indicated in these Contract Documents and a statement showing an accounting of changes to the Contract Sum.

a. If 100 percent completion cannot be shown, include a list of incomplete items, the value of incomplete construction, and reasons the Work is not complete.

full amount paid to date in the previous requisition. Submit a final lien waiver from the general contractor.

5. Submit final meter readings for utilities, a measured record of stored fuel, and similar data as of the date of Substantial Completion, or when the Owner took possession of and responsibility for corresponding elements of the work.

6. Submit consent of surety to final payment.

7. Submit a final liquidation damages settlement statement.

8. Submit evidence of final, continuing insurance coverage complying with insurance requirements.

B. Reinspection Procedures: The Architect will reinspect the Work upon receipt of notice that the Work, including inspection list items from earlier inspections, has been completed, except items whose completion has been delayed because of circumstances acceptable to the Architect.

1. Upon completion of reinspection, the Architect will prepare a certificate of final acceptance, or advise the Contractor of work that is incomplete or of obligations that have not been fulfilled but are required for final acceptance.

2. If necessary, reinspection will be repeated.

1.5 RECORD DOCUMENT SUBMITTALS

A. Record Drawings: Maintain a clean, undamaged set of blue or black line white-prints of Contract Drawings and Shop Drawings. Mark the set to show the actual installation where the installation varies substantially from the Work as originally shown. Mark whichever drawing is most capable of showing conditions fully and accurately; where Shop Drawings are used, record a cross-references at the corresponding location on the Contract Drawings. Give particular attention to concealed elements that would be difficult to measure and record at a later date.

1. Mark record sets with red erasable pencil; use other colors to distinguish between variations in separate categories of the Work.

2. Mark new information that is important to the Owner, but was not shown on Contract Drawings or Shop Drawings.

3. Note related Change Order numbers where applicable.

4. Organize record drawing sheets into manageable sets, bind with durable paper cover sheets, and print suitable titles, dates and other identification on the cover of each set.

1. Maintenance manuals.
2. Record documents.
3. Spare parts and materials.
4. Lubricants.
5. Fuels.
6. Identification systems.
7. Control sequences.
8. Hazards.
9. Cleaning.
10. Warranties and bonds.

B. As part of instruction for operating equipment, demonstrate the following procedures:

1. Start-up.
2. Shutdown.
3. Emergency operations.
4. Noise and vibration adjustments.
5. Safety procedures.

3.2 FINAL CLEANING

A. General: General cleaning during construction is required by the General Conditions and included in Section "Temporary Facilities".

B. Cleaning: Employ experienced workers or professional cleaners for the final cleaning. Clean each surface or unit to the condition expected in a normal, commercial building cleaning and maintenance program. Include cleaning of all existing surfaces within the limit of work. Comply with manufacturer's instructions.

1. Complete the following cleaning operations before requesting inspection for Certification of Substantial Completion.

a. Remove labels that are not permanent labels.

SECTION 01740

WARRANTIES AND BONDS

PART 1-GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section specifies general administrative and procedural requirements for warranties and bonds required by the Contract Documents, including manufacturers standard warranties on products and special warranties.

1. Refer to the General Conditions for terms of the Contractor's special warranty of workmanship and materials.

2. General closeout requirements are included in Section "Project Closeout."

3. Specific requirements for warranties for the Work and products and installations that are specified to be warranted, are included in the individual Sections of Division-2 through 16.

4. Certifications and other commitments and agreements for continuing services to Owner are specified elsewhere in the Contract Documents.

B. Disclaimers and Limitations: Manufacturer's disclaimers and limitations on product warranties do not relieve the Contractor of the warranty on the Work that incorporates the products, nor does it relieve suppliers, manufacturers, and subcontractors required to countersign special warranties with the Contractor.

1.3 WARRANTY REQUIREMENTS

A. Related Damages and Losses: When correcting warranted Work that has failed, remove and replace other Work that has been damaged as a result of such failure or that must be removed and replaced to provide access for correction of warranted Work.

B. Reinstatement of Warranty: When Work covered by a warranty has failed and been corrected by replacement or rebuilding, reinstate the warranty by

2. When operating and maintenance manuals are required for warranted construction, provide additional copies of each required warranty, as necessary, for inclusion in each required manual.

PART 2-PRODUCTS (Not Applicable)

PART 3-EXECUTION (Not Applicable)

END OF SECTION

SECTION 02110

SITE CLEARING

PART 1-GENERAL

1.1 RELATED DOCUMENTS

A. drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

B. Section 02200 Earthwork.

1.2 SUMMARY

A. This Section includes the following.

1. Protection of existing trees indicated to remain
2. Removal of trees and other vegetation
3. Topsoil stripping.
4. Clearing and grubbing.
5. Removing above-grade improvements.
6. Removing below-grade improvements.

1.3 PROJECT CONDITIONS

A. Traffic: Conduct site-clearing operations to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities. Do not close or obstruct streets, walks, or other occupied or used facilities without permission from authorities having jurisdiction.

B. Protection of Existing Improvements: Provide protections necessary to prevent damage to existing improvements indicated to remain in place.

1. Protect improvements on adjoining properties and on Owner's property owners.

2. Restore damaged improvements to their original condition, as acceptable to property owners.

A. Protection of Existing Trees and Vegetation: Protect existing trees and other vegetation indicated to remain in place against unnecessary cutting, breaking or skinning of roots, skinning or bruising of bark, smothering of trees by stockpiling construction materials or excavated materials within drip line, excess foot or

1. Strip topsoil to whatever depths encountered in a manner to prevent intermingling with underlaying subsoil or other objectionable material. Remove heavy growths of grass from areas before stripping. Where existing trees are indicated to remain, leave existing topsoil in place within drip lines to prevent damage to root systems.

2. Stock pile topsoil in storage piles in areas indicated or directed. Construct storage pile to provide free drainage of surface water. Cover storage piles, if required, to prevent wind erosion.

3. Dispose of unsuitable or excess topsoil as specified for disposal of waste materials.

C. Clearing and Grubbing: Clear site of trees, shrubs, and other vegetation, except for those indicated to be left standing.

1. Completely remove stumps, roots, and other debris protruding through ground surface.

2. Use only hand methods for grubbing inside drip line of trees indicated to remain.

3. Fill depressions caused by clearing and grubbing operations with satisfactory soil material, unless further excavation or earthwork is indicated.

a. Place fill material in horizontal layers not exceeding 6 inches loose depth, and thoroughly compact each layer to a density equal to adjacent original ground.

4. Removal of Improvements: Remove existing above-grade improvements as indicated and as necessary to facilitate new construction.

3.2 DISPOSAL OF WASTE MATERIALS

A. Burning on Owner's Property: Burning is not permitted on Owner's property.

B. Removal to Owner's Spoil Area: Transport waste materials and unsuitable topsoil materials to designated spoil areas on Owner's property and dispose of as directed.

END OF SECTION

SECTION 02200

EARTHWORK

PART 1-GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

B. Section 02450 Erosion and Sediment Control.

1.2 SUMMARY

A. This Section includes the following.

1. Preparing and grading subgrades for foundations and slab on grade.

2. Excavating and backfilling for utilities, pavement structures, and site improvements.

1.3 DEFINITIONS

A. Excavation consists of the removal of material encountered to subgrade elevations and the reuse or disposal of materials removed.

B. Subgrade: the uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase, drainage fill, or topsoil materials.

C. Borrow: Soil material obtained off-site when sufficient approved soil material is not available from excavations.

D. Drainage Fill: Course or washed granular material supporting slab-on-grade placed to cut off upward capillary flow of pore water.

E. Unauthorized excavation consists of removing materials beyond indicated subgrade elevations or dimensions without direction by the Architect. Unauthorized excavation, as well as remedial work directed by the Architect, shall be at the Contractor's expense.

F. Structures: Buildings, footings, foundations, slabs, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below ground surface.

G. Structural fill: clean, well-graded gravel, or course sand.

1.4 QUALITY ASSURANCE

B. Protect structures, utilities, sidewalks, pavements, trees and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.

3.2 DEWATERING

A. Prevent subsurface or ground water from entering excavations, from pounding on prepared subgrades, and from flooding Project site and surrounding area.

B. Protect subgrades and foundation soils from softening and damage by water accumulation.

3.3 EXCAVATION

A. Explosives: Do not use explosives.

B. Classified Excavation: Excavation is classified and includes excavation to required subgrade elevations. Excavation will be classified as earth excavation or rock excavation as follows:

1. Earth excavation includes excavation of pavements and other obstructions visible on the surface ; underground structures, utilities, and other items indicated to be demolished and removed; together with soil and other materials encountered that are not classified as rock or unauthorized excavation

2. Rock excavation includes removal and disposal of rock material and obstructions encountered that must be removed by jackhammering.

    a. Rock material includes boulders 1/2cu. Yd. or more in volume and rock in beds, ledges, unstratified masses, and conglomerate deposits.

3. No excavation of rock is expected in this project however, if encountered, no additional expense will be paid by the owner. The Contractor is advised to include whatever contingency he sees fit in his bid.

3.4 STABILITY OF EXCAVATIONS

A. Comply with local codes, ordinances, and requirement of authorities having jurisdiction to maintain stable excavations.

B. Contractor is required to confirm to OSHA (29 CFR Part 1926.650-652) subpart P "Construction Standard for Excavations."

3.5 EXCAVATION FOR STRUCTURES

A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 0.10 foot. Extend excavations a sufficient distance from structures for placing

3. Removal of trash and debris from excavation.

4. Installation and inspection of utilities with approval from Architect or governing utility company.

3.10 FILL

A. Preparation: Remove debris, wet, and unsatisfactory soil materials, obstructions, and deleterious materials from ground surface prior to placing fills.

1. Plow strip, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing surface.

B. When subgrade or existing ground surface to receive fill has a density less than that required for fill, break up ground surface to depth required, pulverize, moisture-condition or aerate soil and recompact to required density.

C. Place fill material in layers to required elevation for each location listed below.

1. Under building slabs, use drainage fill material.

2. Under parking areas including shoulders and site improvements, use satisfactory excavated or borrow soil materials.

3.11 MOISTURE CONTROL

A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill layer before compaction to within 2 percent of optimum moisture content.

3.12 Compaction

A. Place backfill and fill materials in layers not more than 4 inches in loose depth for material compacted by hand operated tampers, or 12 inches with proven large ride-on equipment.

B. Proof roll subgrade prior to slab construction, provide structural fill meeting the gradation specified herein for fill materials below the slab, maximum percetnt passing 200 sieve = 7%.

C. Compact controlled structural fills in accordance with the following schedule and ASTM D1557. Use only hand operated equipment adjacent to walls. Fill both sides of walls to equal elevations before compacting. Moisture adjust as needed.

Degree of Compaction: Compact to the following minimum densities:

FILL AND BACKFILL LOCATION	DENSITY
Under structure foundations	95% of max
Top 2 feet under pavement	95%
Below top 2 feet under pavement	92%

1. Perform field in-place tests according to ASTM D 1556 (sand cone method), ASTM D 2167 (rubber-balloon method), or ASTM D 2937 (drive cylinder method), as applicable.

    a. Field in-place density tests may also be performed by the nuclear method according to ASTM D 2922, provided that calibration curves are periodically checked and adjusted to correlate to tests performed using ASTM D 1556. With each density calibration check, check the calibration curves furnished with the moisture gages according to ASTM D 3017.

    b. When field in-place density tests are performed using nuclear methods, make calibration checks of both density and moisture gages at beginning of work, on each different type of material encountered, and at intervals as directed by the Architect.

D. When testing agency reports that subgrades, fills, or backfills are below specified density, scarify and moisten or aerate, or remove and displace soil to the depth required, recompact and retest until required density is obtained.

3.15 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Provide site grading for site and around perimeter of building to provide positive drainage away from the foundation during and after construction in conformance with Site Plan sheet C1 prepared by Associated Design Partners, Inc.

B. Disposal: Remove surplus satisfactory soil and waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it off the Owner's property.

3.16 GEOTECHNICAL REQUIREMENTS

A. All earthwork, excavation, and foundation work shall be in accordance with the recommendations in the following geotechnical report no. 98-037 S prepared by S.W. Cole Inc. dated February 9, 1998. The attached report is hereby made a part of these specifications in this section 02200:

END OF SECTION

GEOTECHNICAL ENGINEERING SERVICES
PROPOSED MAINTENANCE GARAGE
RIVERSIDE STREET
PORTLAND, MAINE

98-037 S February 9, 1998

TABLE OF CONTENTS

S.W.COLE
ENGINEERING, INC.
GEOTECHNICAL CONSULTANTS

Gray Plaza, P.O. Box 378, Gray, ME 04039 TEL (207) 657-2866 FAX (207) 657-2840
Six Liberty Drive, Bangor, ME 04401 TEL (207) 848-5714 FAX (207) 848-2403
161 Water St., P.O. Box 220, Caribou, ME 04736 TEL (207) 496-1511 FAX (207) 496-1501

98-037 S

February 9, 1998

City of Portland
C/O Port City Architecture
Attn: Mr. Andrew Hyland
71 Federal Street
Portland, ME 04101

Subject: Geotechnical Engineering Services
Proposed Maintenance Garage
Riverside Street
Portland, Maine

Dear Mr. Hyland:

In accordance with our Proposal dated January 26, 1998, we have made a subsurface investigation at the proposed maintenance garage addition at the Riverside Golf Course Facility in Portland, Maine.

1.0 INTRODUCTION

1.1 Scope of Work

The purpose of the investigation was to explore the subsurface conditions at the site and provide recommendations relative to soil bearing capacity, foundation drainage, subgrade preparation and potential for settlement. The investigation included the making of five test pit explorations, laboratory testing, and a geotechnical evaluation of the findings as they relate to the proposed construction. The contents of this report are subject to the limitations set forth in Attachment A.

1.2 Proposed Construction

We understand that the proposed building will be one story, wood framed measuring approximately 50 by 100 feet in plan dimensions. The structure is to be slab-on-grade with a finish floor elevation of 108. The site will require a cut of about 5 feet throughout a majority of the proposed building with the exception of the northeast corner which will require up to 1 foot of fill to achieve bottom of slab grade. We understand that the

Test Pits TP-1 and TP-2 made on the southerly side of the proposed building generally encountered 4 inches of grass and roots, overlying about 2 feet of dark brown topsoil with organics. The topsoil overlies very stiff to stiff grayish brown silty clay. Test Pits TP-1 and TP-2 were terminated in the silty clay at depths of 9.0 and 10.0 feet, respectively.

Test Pits TP-3 through TP-5 were made generally on the northerly side of the proposed building. Test Pits TP-3 and TP-4 generally encountered 4 inches of grass and roots or forest duff overlying 0.5 to 1.0 foot of dark brown topsoil with organics. The topsoil overlies very stiff grayish brown silty clay. Test Pits TP-3 and TP-4 were terminated in the silty clay at depths of 7.0 and 6.0 feet, respectively. Test Pit TP-5 was made to determine the extent of fill soils on the northerly side of the proposed building. Test Pit TP-5 encountered about 2 feet of dark brown topsoil (fill) overlying native grayish brown silty clay. Test Pit TP-5 was terminated in the silty clay at a depth of 3.0 feet.

3.3 Groundwater

Groundwater was not observed in the test pits at the time of exploration work. However the soils were generally moist at depths of 2 feet and greater. Due to the short time period of exploration work and relatively impermeable and slow draining soils that were encountered, accurate groundwater levels could not be obtained. Long term groundwater information is not available.

4.0 EVALUATION AND RECOMMENDATIONS

4.1 Site Suitability & Site Preparation

Based on the findings at the exploration locations and our understanding of the project, it is our opinion that the proposed building site is suitable from a soils standpoint. The stiff to very stiff grayish brown silty clay will provide adequate support of the proposed structure. We recommend site preparation begin with the removal of all organics and topsoil from areas of construction.

select fill. We also recommend that at least 8 inches of select fill be placed directly below the floor slab in the heated area of the building. On the cold storage side of the building 4.5 feet of select fill should be placed directly under the slab to prevent heaving and cracking. Alternatively a 2 inch layer of rigid extruded polystyrene subgrade insulation could be utilized to reduce the amount of clean fill required. The insulation should be placed beneath 18" of select fill placed directly beneath the floor slab. We further recommend that the insulation extend at least 4 feet into the heated area of the building. General insulation details are provided on Sheet 6. Select fill should meet the following gradation specification:

Sieve Size	Percent Finer By Weight Select Fill
6 Inches	
4 Inches	100
3 Inches	90-100
¼ Inch	25-90
#40	0-30
#200	0-5

Sub-slab fill and any fill placed below footing areas should be compacted to at least 95 percent of its maximum dry density as determined by ASTM D-1557. Exterior foundation backfill should be compacted to at least 90 percent of ASTM D-1557, provided it is not under paved or structural areas. Exterior foundation backfill should be compacted to at least 95 percent beneath paved areas are entrance slabs.

4.5 Control Joints

Site preparation will require up to 5 feet of cut throughout the majority of the building footprint. The proposed building is to be relatively light compared to the existing soils being removed. Based on observations made at the site the clay soils appear to be over

construction. We would be pleased to assist in developing a scope of services and budget for construction quality control and laboratory materials testing services.

5.0 CLOSURE

We request that S. W. COLE ENGINEERING, INC. be provided the opportunity to review the final design and specifications to determine that our earthwork and foundation recommendations have been properly interpreted and implemented.

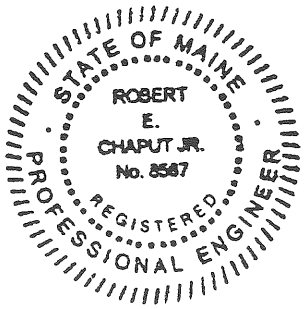
It has been a pleasure to be of assistance to you with this phase of your project. If you have any questions or if we may be of further assistance, please do not hesitate to contact us.

Very truly yours,

S. W. COLE ENGINEERING, INC.

Michael W. Koppang, Soils Engineer

Robert E. Chaput, Jr., P.E.



Attachment A
Limitations

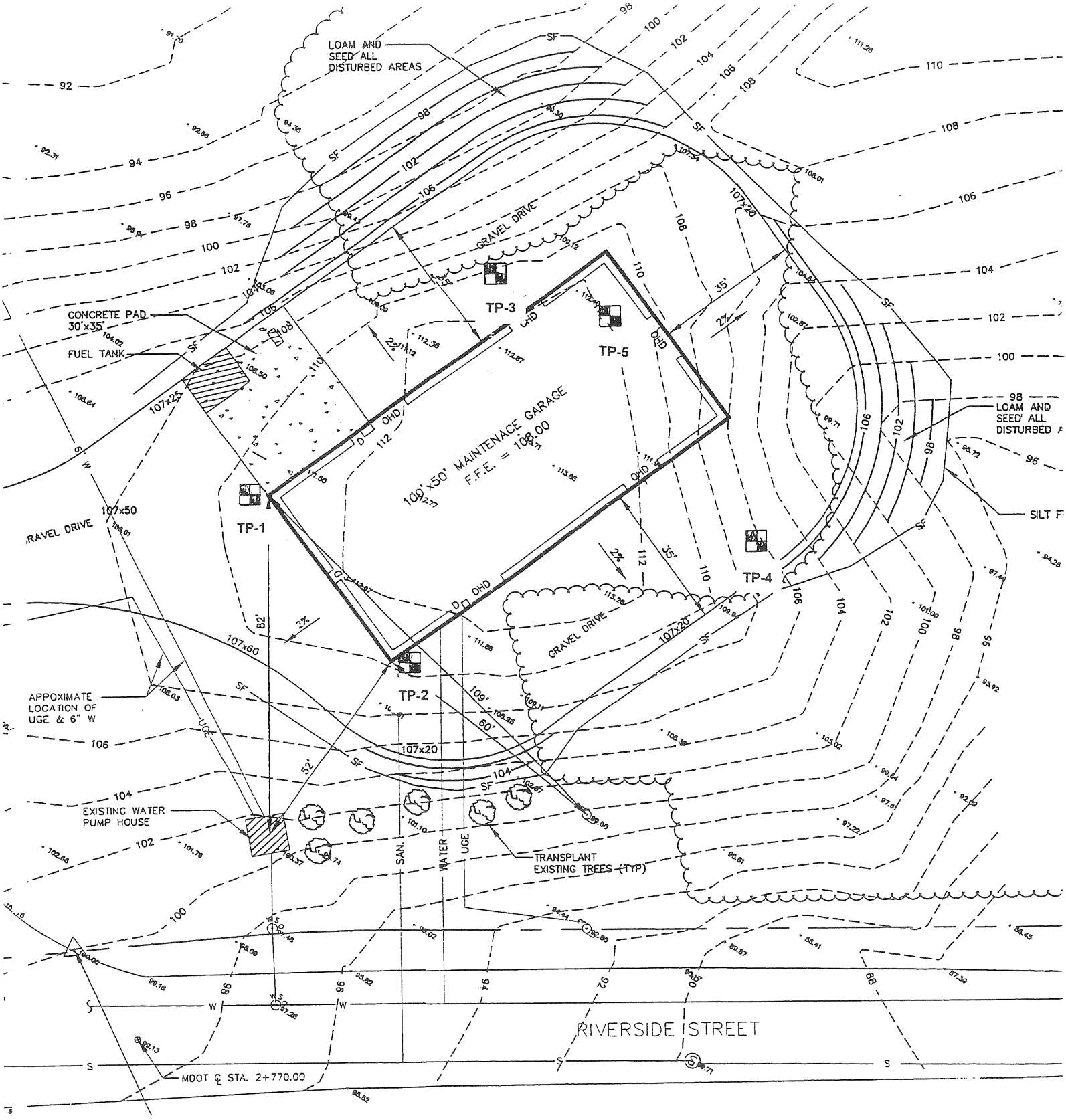
This report has been prepared for the exclusive use of the City of Portland C/O Port City Architects for specific application for the proposed maintenance garage on Riverside Street in Portland, Maine. S. W. COLE ENGINEERING, INC. has endeavored to conduct the work in accordance with generally accepted soil and foundation engineering practices. No other warranty, expressed or implied, is made.

The soil profiles described in the report are intended to convey general trends in subsurface conditions. The boundaries between strata are approximate and are based upon interpretation of exploration data and samples.

The analyses performed during this investigation and recommendations presented in this report are based in part upon the data obtained from subsurface explorations made at the site. Variations in subsurface conditions may occur between explorations and may not become evident until construction. If variations in subsurface conditions become evident after submission of this report, it will be necessary to evaluate their nature and to review the recommendations of this report.

Observations have been made during exploration work to assess site groundwater levels. Fluctuations in water levels will occur due to variations in rainfall, temperature, and other factors.

Recommendations contained in this report are based substantially upon information provided by others regarding the proposed project. In the event that any changes are made in the design, nature, or location of the proposed project, S. W. COLE ENGINEERING, INC. should review such changes as they relate to analyses associated with this report. Recommendations contained in this report shall not be considered valid unless the changes are reviewed by S. W. COLE ENGINEERING, INC.



S. W. COLE ENGINEERING, INC. GEOTECHNICAL CONSULTANT	
CITY OF PORTLAND **EXPLORATION LOCATION PLAN** PROPOSED MAINTENANCE BUILDING RIVERSIDE GOLF COURSE, RIVERSIDE STREET PORTLAND, MAINE	
Job No. 98-037 S Date 2/4/98	Scale: Sheet: 1

LEGEND

Approximate test pit Location

NOTES:

Base plan provided by Port City Architecture

S. W. COLE ENGINEERING, INC

TEST PIT LOG

PROJECT/CLIENT: RIVERSIDE GOLF COURSE / CITY OF PORTLAND
LOCATION: RIVERSIDE STREET PORTLAND, MAINE
PROJECT NO. 98-037 S

TEST PIT TP-3

DATE: 2/3/98 SURFACE ELEVATION: 110.0+/- LOCATION: SEE SHEET 1

SAMPLE NO.	SAMPLE DEPTH	DEPTH (FT)	STRATUM DESCRIPTION	TEST RESULTS
		4"+/-	GRASS AND ROOTS	
			GRAYISH BROWN SILTY CLAY	qp = 8.0 ksf
S-1	4.0'		~VERY STIFF~	w = 31.7% qp = 8.0 ksf
		7.0'		qp = 9.0 ksF
			BOTTOM OF EXPLORATION @ 7.0'	

COMPLETION DEPTH: 7.0' DEPTH TO WATER: NO FREE WATER OBSERVED
SOILS GENERALLY MOIST

TEST PIT TP-4

DATE: 2/3/98 SURFACE ELEVATION: 106.0+/- LOCATION: SEE SHEET 1

SAMPLE NO.	SAMPLE DEPTH	DEPTH (FT)	STRATUM DESCRIPTION	TEST RESULTS
		4"+/-	FOREST DUFF	
		1.0'	DARK BROWN TOPSOIL W/ORGANICS	
			GRAYISH BROWN SILTY CLAY	qp = 8 TO 9 ksf
		6.0'	~VERY STIFF~	
			BOTTOM OF EXPLORATION @ 6.0'	

COMPLETION DEPTH: 6.0' DEPTH TO WATER: NO FREE WATER OBSERVED
SOILS GENERALLY MOIST

KEY TO THE NOTES & SYMBOLS
Test Boring and Test Pit Explorations

All stratification lines represent the approximate boundary between soil types and the transition may be gradual.

Key to Symbols Used:

w	-	water content, percent (dry weight basis)
q_u	-	unconfined compressive strength, kips/sq. ft. - based on laboratory unconfined compressive test
S_v	-	field vane shear strength, kips/sq. ft.
L_v	-	lab vane shear strength, kips/sq. ft.
q_p	-	unconfined compressive strength, kips/sq. ft. based on pocket penetrometer test
O	-	organic content, percent (dry weight basis)
W_L	-	liquid limit - Atterberg test
W_P	-	plastic limit - Atterberg test
WOH	-	advance by weight of hammer
WOM	-	advance by weight of man
WOR	-	advance by weight of rods
HYD	-	advance by force of hydraulic piston on drill
RQD	-	Rock Quality Designator - an index of the quality of a rock mass. RQD is computed from recovered core samples.

Description of Proportions:

0 to 5% TRACE
5 to 12% SOME
12 to 35% "Y"
35+% AND

REFUSAL: **Test Boring Explorations** - Refusal depth indicates that depth at which, in the drill foreman's opinion, sufficient resistance to the advance of the casing, auger, probe rod or sampler was encountered to render further advance impossible or impracticable by the procedures and equipment being used.

REFUSAL: **Test Pit Explorations** - Refusal depth indicates that depth at which sufficient resistance to the advance of the backhoe bucket was encountered to render further advance impossible or impracticable by the procedures and equipment being used.

Although refusal may indicate the encountering of the bedrock surface, it may indicate the striking of large cobbles, boulders, very dense or cemented soil, or other buried natural or man-made objects or it may indicate the encountering of a harder zone after penetrating a considerable depth through a weathered or disintegrated zone of the bedrock.

SECTION 02450 - EROSION AND SEDIMENTATION CONTROL

PART 1 - GENERAL

1.01 RELATED DOCUMENTS: The general provisions of the contract, including General and supplementary Conditions and General Requirements (if any) apply to the work specified in this Section.

1.02 RELATED WORK SPECIFIED ELSEWHERE:

A. Earthwork: Section 02200

B. Riprap: Section 02541

C. Contract Drawings

1.03 DESCRIPTION OF WORK:

A. The Contractor shall provide all materials, equipment, and labor necessary for the diversion of surface water from the construction area and provision of temporary and permanent erosion and sedimentation control structures and measures as shown on the plans and/or set forth in these Specifications, and as designated in the "Erosion and Sediment Control Plan" appended to these specifications.

B. Erosion and sedimentation controls shall be provided in accordance with these Specifications for all areas within the limits of this Contract where existing earth and vegetation will be disturbed by construction.

1.04 EROSION AND SEDIMENTATION CONTROL GUIDELINES:

A. U.S. Environmental Protection Agency Publication 430/9-73-007, Processes, Procedures and Methods to Control Pollution Resulting From All Construction Activity, Washington, D.C., October 1973.

B. U.S. Department of Agriculture Soil Conservation Service Publication, Standards and Specifications for Soil Erosion and Sediment Control in Developing Areas, Maryland, July 1975.

1.05 CONFORMANCE WITH ENVIRONMENTAL LICENSING REQUIREMENTS:

All construction under this project shall be subject to review and/or inspection by local, State, and Federal agencies for the adequacy of erosion and sedimentation

2. Perimeter dikes around the downslope periphery of areas to be disturbed by construction, outletting to sediment traps or sediment basins.

3. Temporary seeding and mulching of soil stockpiles or disturbed areas.

4. Other temporary practices as approved by the Engineer.

C. Permanent measures for controlling erosion and sedimentation shall be provided as shown on the plans or required by these Specifications.

D. Where disturbed areas cannot be permanently stabilized within 90 days of exposure of the soil, the areas shall be temporarily seeded and mulched as specified under Section 02800, or otherwise stabilized as approved by the Engineer.

E. Permanent soil stabilization measures for all slopes, channels, ditches, or any disturbed land area shall be completed within 30 calendar days after final grading has been completed. Where such permanent erosion control measures are not possible or practical to implement, and upon approval by the Engineer, temporary stabilization practices shall be applied as in 3.01.D above.

F. All temporary and permanent control measures shall be periodically inspected and maintained by the Contractor for the duration of the construction and warranty period of this Contract. Sediment collection devices shall be cleaned periodically as required, and the removed material reused or disposed of at an approved disposal area.

3.02 DIVERTING SURFACE WATER:

A. Build, maintain, and operate all cofferdams, channels, flumes, sumps, and other temporary diversion and protection works needed to divert streamflow and other surface water through or around the construction site and away from the construction work while construction is in progress.

B. Outlet diverted stormwater to sedimentation trap or basin or other approved sedimentation control measure.

3.03 SILTATION FENCE:

A. Construct siltation fences at the locations and to the dimensions shown on the Drawings, and as required to meet specified criteria.

SECTION 03001 - CONCRETE

PART 1: GENERAL

1.01 RELATED DOCUMENTS

A. The drawings and the General Provisions including Parts B, C, and D of the specifications are hereby made a part of the work of this section.

1.02 WORK INCLUDED

A. Furnish all labor, equipment, and materials, and perform all operations necessary to complete the concrete work in accordance with the drawings and specifications.

B. The work includes, but is not limited to, the following:

1. Formwork, Shoring, Bracing, and Anchorage
2. Concrete Reinforcement and Accessories
3. Cast-in-Place Concrete
4. Footings
5. Walls
6. Concrete Pads
7. Floor Slabs

1.03 RELATED WORK

A. Section 06100 - Rough Carpentry

B. Section 07160 - Bituminous Damp-proofing

C. Section 07200 - Insulation, Vapor Barrier and Moisture Barrier

D. Section 07900 - Joint Sealants

1.04 QUALITY ASSURANCE

A. Perform work in accordance with ACI 301.

B. Maintain copy of ACI 301 on site.

C. Concrete field quality control testing shall be performed only by technicians certified by (1) the Maine Concrete Technicians Certification Board, or (2) another body having a certification reciprocity agreement with the Maine Concrete Technicians Certification Board.

D. Testing:

B. American Society for Testing and Materials (ASTM):

1. A 185 - Welded Steel Wire Fabric for Concrete Reinforcement
2. A 615 - Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
3. C 33 - Concrete Aggregate
4. C 39 - Compressive Strength of Cylindrical Concrete Specimens
5. C 94 - Ready-Mixed Cement
6. C 150 - Portland Cement
7. C 260 - Air-Entraining Admixtures for Concrete
8. C 309 - Liquid Membrane-Forming Compounds for Curing Concrete
9. C 494 - Chemical Admixtures for Concrete
10. C 1018 - Standard Test Method for Flexural Toughness and First-Crack Strength of Fiber-Reinforced Concrete (Using Beam with Third-Point Loading)
11. C 1116 - Type III - Sections 4.1.3 and 4.2, and Performance Level I, Toughness Index I5 outlined in Section 21, Note 17, Standard Specification for Fiber-Reinforced Concrete and Shotcrete
12. C989 -Groud granulated blast - furnace slag for use in concrete and mortars.

C. Federal Specifications (FS):

1. TT-C-800 -Curing Compound, Concrete, for New and Existing Surfaces

D. Concrete Reinforcing Steel Institute (CRSI):

1. CRSI -Manual of Standard Practice and Recommended Practice for Placing Reinforcing Bars

E. American Welding Society (AWS)

F. Scaffolding and Shoring Institute (SSI):

1. Scaffolding and Shoring Safety Rules

1.06 SUBMITTALS

A. Submit six (6) copies of reinforcing shop drawings for Architect/Engineer's general check and review. Shop drawings must indicate reinforcement placement, sizes, handling and cutting schedules, splicing, supporting and spacing devices. Follow the Building Code, ACI 318, and "Recommended Standard Practice for Detailing Reinforcing Concrete Structures," ACI 315.

B. Submit six (6) copies of the cement manufacturer's letter of certification and chemical content test results stating that the Portland cement is in compliance with ASTM designation C 150 and ASTM C 114.

exposed perimeter strip adhesive.

7. Roll out Vaporshield barrier material, overlapping edge rolls and all seams by 3". Tape all seams with Vaporshield seaming tape.

8. All tears, punctures, etc. to be repaired and taped as required to maintain the watertight integrity of the vapor barrier system.

3.21 SPECIAL NOTE

A. Additives for concrete may be used only with the written consent of the Architect/Engineer.

END OF SECTION

SECTION 05500

METAL FABRICATIONS

PART 1-GENERAL

1.1 WORK INCLUDED

A. Furnish all items and assemblies fabricated from structural steel shapes and other materials as shown and specified. Items included, but no limited to, are as follow:

1. Miscellaneous Framing and Supports (including canopy supports)
2. Miscellaneous Steel Shapes
3. Bollards
4. Guardrails and Handrails
5. Steel Protection plate for work bench.

1.2 RELATED WORK

1. Section 09900- Painting.

1.3 REFERENCES

A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by basic designation only.

1. American Society for Testing and Materials (ASTM):

A36-74	Structural Steel
A123-78	Rolled, Pressed and Forged Steel Shapes, Plates, Bars and Strip

2. American Welding Society (AWS):

D1.1-88	Structural Welding Code – Steel

3. The National Association of Architectural Metal Manufacturers (NAAMM):

Metal Finishes Manual

B. Structural Steel Painting Council (SSPC)

SSPC-SP 1-63	NO. 1, SOLVENT CLEANING
SSPC-SP 2-63	NO. 2, HAND TOOL CLEANING

2. Metal Surfaces, General: For fabrication of miscellaneous metal work which will be exposed to view, use only materials which are smooth and free of surface blemishes including pitting, seam marks, roller marks, roller trade names and roughness,

3. Steel Plates, Shapes, and Bars: ASTM A 36/A 36m.

4. Cold-Rolled Sheet Steel: ASTM A 366, Class 1 matte finish.

5. Channels, lintels, bridging, hangers, separators, plates, stiffeners, brackets, bearing plates, anchors, bolts and nuts and all connections including holes and clip angles for securing blocking as required to complete the work of other divisions, shall conform to ASTM Specification for Bridges and Buildings, Serial Designation A-36, as amended to date.

6. Steel Tubing: Product type (manufacturing method) and as follows:

a. Cold-Formed Steel Tubing: AST A 500.

b. Hot-Formed Steel Tubing: ASTM A 501.

c. For exterior installations and where indicated, provide tubing with hot-dip galvanize coating per ASTM A 53.

B. Fasteners:

1. General: Provide zinc-coated fasteners for exterior use or where built into exterior walls. Select fasteners for the type, grade and class required.

2. Bolts and Nuts: Regular hexagon head type, ASTM A 307, Grade A.

3. Lag Bolts: Square head type, FS FF-B-561.

4. Machine Screws: Cadmium plated steel, FS FF-S=92.

5. Wood Screws: Flat head carbon steel, FS FF-S-111.

6. Plain Washers: Round, carbon steel, FS FF-w-92.

7. Masonry Anchorage Devices: Expansion shields, FS FF-S-325.

8. Toggle Bolts: Tumble-wing type, FS FF-B-588, type, class and style as required.

9. Lock Washers: Helical spring type carbon steel, FS FF-W-84.

C. Paint:

1. Metal Primer Paint: 37-78 Grey Chem-Prime by TNEMEC or approved equal. No primers containing lead or chromates will be acceptable. Primer shall be compatible with paint finish.

5. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners wherever possible. Use exposed fasteners of type shown or, if not shown, Phillips flat-head (countersunk) screws or bolts.

6. Provide for anchorage of type shown, coordinated with supporting structure. Fabricate and space anchoring devices to provide adequate support for intended use.

7. Cut, reinforce, drill and tap miscellaneous metal work as indicated to receive finish hardware and similar items.

8. Fabricate joints which will be exposed to weather in a manner to exclude water or provide weep holes where water may accumulate.

B. Shop Painting:

1. Shop paint miscellaneous metal work, except members or portions of members to be embedded in concrete or masonry, surfaces and edges to be field welded, and galvanized surfaces, unless otherwise specified.

2. Remove scale, rust and other deleterious materials before applying shop coat. Clean off heavy rust and loose mills scale in accordance with SSPC-SP-2 "Hand Tool Cleaning", SSPC SP-3 "Power Tool Cleaning", or SSPC SP-7 "Brush-Off Blast Cleaning".

3. Remove oil, grease and similar contaminants in accordance with SSPC SP-1 "Solvent Cleaning".

4. Immediately after surface preparation, brush or spray on primer in accordance with manufacturer's instructions, and at a rate to provide uniform dry film thickness of 2.o mils for each coat. Use painting methods with will result in full coverage of joints, corners, edges and exposed surfaces.

5. Apply one shop coat to fabricated metal items, except apply two coats of paint to surfaces inaccessible after assembly or erection. Change color of second coat to distinguish it from the first.

C. Welding: Remove slag and grind all welds smooth.

2.5 MISCELLANEOUS METAL FABRICATIONS

A. Rough Hardware:

1. Furnish bent or otherwise custom fabricated bolts, plates anchors, hangers, dowels and other miscellaneous steel and iron shapes as required for framing and supporting woodwork, and for anchoring or securing woodwork to concrete or other structures. Straight bolts and other stock rough hardware items are specified in Division 6.

established lines and levels. Provide temporary bracing or anchors in formwork for items which are to be built into concrete, masonry or similar construction.

3. Fit exposed connections accurately together to form tight hairline joints. Weld connections which are not to be left as exposed joints, but cannot be shop welded because of shipping size limitations. Grind exposed joints smooth and touch-up shop paint coat. Do not weld, cut or abrade the surfaces of exterior units which have been hot-dip galvanized after fabrication and are intended for bolted or screwed field connections.

4. Field Welding: Comply with AWS Code for procedures of manual shielded metal-arc welding, appearance and quality of welds made, and methods used in correcting welding work

3.3 ADJUST AND CLEAN

A. Touch-Up Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with same material as used for shop painting. Apply by brush or spray to provide a minimum dry film thickness of 2.0 mils.

B. For galvanized surfaces, clean welds, bolted connections, and abraded area, and apply galvanizing repair paint to comply with ASTM A 780.

END OF SECTION

SECTION 06200

FINISH CARPENTRY

PART1-GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division I Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Interior standing and running trim and rails (window sills, etc.).
2. Wood Wainscots.
3. Wood Stairs.
4. Work benches and shelving.

B. Related Sections: The following Sections contain requirements that relate to this Section:

1. Division 7 Section "Joint Sealants" for sealants.
2. Division 9 Section "Painting" for back priming and finishing of finish carpentry.

1.3 SUBMITTALS

A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.

B. Product data for each type of factory-fabricated product and process specified, including details of construction relative to materials, dimensions of individual components, and profiles.

1.4 QUALITY ASSURANCE

Installer Qualifications: Arrange for installation of finish carpentry by firm that can demonstrate successful experience in installing finish carpentry items similar in type and quality to those required for this Project.

2. Moisture Content of Softwood Lumber: Provide kiln-dried (KD) lumber having a moisture content from time of manufacture until time of installation not greater than values required by the applicable grading rules of the respective grading and inspecting agency for the species and product indicated.

3. Moisture Content of Hardwood Lumber: Provide kiln-dried (KD) lumber having a moisture content from time of manufacture until time of installation within the ranges required in the referenced woodworking standard.

4. Lumber for Natural Finish (Clear): Use pieces made of solid lumber stock.

5. Lumber for Painted Finish: At Contractor's option, use pieces which are either glued-up lumber or made of solid lumber stock.

6. Standing and Running Trim for Painted Finish: Any softwood species graded and inspected by WWPA complying with following :

    a. Grade for Standard Sizes and Patterns: "C Select" or "Choice" for Eastern White Pine.

    b. Grade for Special (Custom) sizes and Patterns: Custom for quality of materials and manufacture as required in referenced woodworking standard.

2.3 MISCELLANEOUS MATERIALS

A. Fasteners for Interior Finish Carpentry: Nails, screws, and other anchoring devices of type, size, material, and finish required for application indicated to provide secure attachment, concealed where possible.

    1. Countersink nails, fill surface flush, and sand where face nailing, is unavoidable.

B. Sealants: Comply with requirements of Division 7 Section "Joint Sealants" for materials required for sealing, siding work.

2.4 FABRICATION

A. Wood Moisture Content: Comply with requirements of specified inspection agencies and manufacturer's recommendations for moisture content of finish carpentry in relation to relative humidity conditions existing during, time of fabrication and in installation areas. Provide finish carpentry with moisture content that is compatible with Project requirements.

B. Fabricate finish carpentry to dimensions, profiles and details indicated. Ease edges to radius indicated for the following:

D. Refer to Division 9 Sections for final finishing, of finish carpentry.

E. Standing and Running Trim and Rails: Install with minimum number of joints practical, using full-length pieces from maximum lengths of lumber available. Stagger joints in adjacent and related standing and running trim and rails. Cope at returns and miter at corners to produce tight-fitting joints with full -surface contact throughout length of joint. Use scarf joints for end-to-end joints. Plane back of casings to provide uniform thickness across joints if required.

F. Install trim after drywall joint finishing, operations are completed. Drill pilot holes in hardwood prior to nailing or fastening to prevent splitting. Fasten to prevent movement or warping. Countersink nail heads on exposed carpentry work and fill holes.

G. Anchor finish carpentry work to anchorage devices or blocking built-in or directly attached to substrates. Secure to grounds, stripping and blocking with countersunk, concealed fasteners and blind nailing as required for a complete installation. Except where prefinished matching fasteners heads are required, use fine finishing nail for exposed nailings, countersunk and filled flush with finished surface, and matching final finish were transparent is indicated.

3.4 ADJUSTING

A. Repair damaged or defective finish carpentry where possible to eliminate functional or visual defects. Where not possible to repair, replace finish carpentry. Adjust joinery for uniform appearance.

3.5 CLEANING

A. Clean finish carpentry on exposed and semiexposed surfaces. Touch up factory-applied finishes to restore damaged or soiled areas.

3.6 PROTECTION

A. Provide final protection and maintain conditions that ensure finish carpentry is without damage or deterioration at time of Substantial Completion.

END OF SECTION

SECTION 07160

BITUMINOUS DAMPPROOFING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Hot-applied asphalt dampproofing or Cold-applied, cut-back asphalt dampproofing at contractors option.

1.3 SUBMITTALS

A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.

B. Product data for each type of product specified, including data substantiating that materials comply with requirements for each dampproofing material specified. Include recommended method of application, recommended primer, number of coats, coverage or thickness, and recommended protection course.

1.4 QUALITY ASSURANCE

A. Single-Source Responsibility: Obtain primary dampproofing materials and primers from one source and by a single manufacturer. Provide secondary materials only as recommended by manufacturer of primary materials.

1.5 PROJECT CONDITIONS

A. Substrate: Proceed with dampproofing only after substrate construction and penetrating work have been completed.

B. Weather Limitations: Proceed with dampproofing only when existing and forecasted weather conditions will permit work to be performed according to manufacturer's recommendations and warranty requirements.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:

1. Hot-Applied Asphalt Dampproofing:

a. Meadows: W.R. Meadows, Inc.
b. Owens-Corning Fiberglas Corp.; Trumbull Division.

1. Exterior, below-grade surfaces of exterior concrete or masonry walls in contact with earth or other backfill and where space is enclosed on opposite side.

2. Where indicated on the Drawings.

C. Hot-Applied Asphalt Dampproofing: Apply on exterior below grade surfaces only.

Or

D. Cold-Applied Asphalt Dampproofing: For exterior below grade surfaces, provide either emulsified or cut-back.

E. Bituminous Cant Strips: Install 2-by-2-inch (50-by-50-mm) cant strip of bituminous grout at base of vertical dampproofing where it meets horizontal surface.

F. Apply vertical dampproofing down walls from finished-grade line to top of footing, extend over top of footing, and down a minimum of 6 inches (150 mm) over outside face of footing. Extend 12 inches (300 mm) onto intersecting walls and footings, but do not extend onto surfaces exposed to view when the Project is completed.

3.3 HOT-APPLIED ASPHALT DAMPPROOFING

A. Do not apply hot asphalt when substrate condition causes foaming.

B. Apply a coat of hot asphalt by mopping or spraying at a rate of 20 lb or 2.5 gal./100 sq. ft. (98 kg or 1 L/sq. m), to produce a uniform film thickness of not less than 30 mils (0.8 mm).

3.4 COLD-APPLIED, CUT-BACK ASPHALT DAMPPROOFING

A. Spray Grade: Brush or spray apply a coat of dampproofing at a rate of 1.25 to 2 gal./100 sq. ft. (0.5 to 0.8 L/sq. m), depending on substrate texture, to produce a uniform, dry-film thickness of not less than 12 mils (0.3 mm).

3.5 PROTECTION AND CLEANING

A. Protect exterior, below-grade dampproofing membrane from damage until backfill is completed. Remove overspray and spilled materials from surfaces not intended to receive dampproofing.

END OF SECTION 07160

SECTION 07210
BUILDING INSULATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Foundation wall insulation and under-slab insulation.

2. Concealed building insulation.

B. Related Sections: The following Sections contain requirements that relate to this Section:

1. Division 2 Section "Foundation Drainage System" for insulated drainage panel.

2. Division 9 Section indicated below for insulation installed as part of metal-framed wall and partition assemblies:

a. "Gypsum Board Assemblies."

1.3 SUBMITTALS

A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.

B. Product Data for each type of insulation product specified.

1.4 QUALITY ASSURANCE

A. Single-Source Responsibility for Insulation Products: Obtain each type of building insulation from a single source with resources to provide products complying with requirements indicated without delaying the Work.

B. Fire-Test-Response Characteristics: Provide insulation and related materials with the fire-test-response characteristics indicated on Drawings or specified elsewhere in this Section as determined by testing identical products per test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency.

1. Surface-Burning Characteristics: ASTM E 84.

2. Fire-Resistance Ratings: ASTM E 119.

C. Unfaced Mineral-Fiber Blanket Insulation: Thermal insulation combining mineral fibers of type and described below with thermosetting resins to comply with ASTM C 665, Type I (blankets without membrane facing):

1. Mineral-Fiber Type: Fibers manufactured from Glass.

2. Surface-Burning Characteristics: Maximum flame-spread and smoke-developed indices of 25 and 50, respectively.

2.3 VAPOR RETARDERS

A. Polyethylene Vapor Retarder: ASTM D 4397, 6 mils (0.15 mm) thick, with maximum permeance rating of 0.13 perm (7.5 ng/Pa x s x sq. m).

B. Vapor-Retarder Tape: Pressure-sensitive tape of type recommended by vapor retarder manufacturer for sealing joints and penetrations in vapor retarder.

2.4 AUXILIARY INSULATING MATERIALS

A. Adhesive for Bonding Insulation: Product with demonstrated capability to bond insulation securely to substrates indicated without damaging insulation and substrates.

B. Preformed Filler: Premolded, semi-rigid asphalt/fiber composition board, 1/4 inch (6 mm) thick, formed under heat and pressure, standard sizes.

C. Eave Ventilation Troughs: Preformed rigid fiberboard or plastic sheets designed and sized to fit between roof framing members and to provide cross ventilation between insulated attic spaces and vented eaves.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements of Sections in which substrates and related work are specified and to determine if other conditions affecting performance of insulation are satisfactory. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean substrates of substances harmful to insulations or vapor retarders, including removing projections capable of puncturing vapor retarders or that interfere with insulation attachment.

3.3 INSTALLATION, GENERAL

A. Comply with insulation manufacturer's written instructions applicable to products and application indicated.

C. Firmly attach vapor retarders to substrates with mechanical fasteners or adhesives as recommended by vapor retarder manufacturer.

D. Seal joints caused by pipes, conduits, electrical boxes, and similar items penetrating vapor retarders with vapor-retarder tape to create an airtight seal between penetrating objects and vapor retarder.

E. Repair any tears or punctures in vapor retarders immediately before concealment by other work. Cover with vapor-retarder tape or another layer of vapor retarder.

3.7 PROTECTION

A. General: Protect installed insulation and vapor retarders from damage due to harmful weather exposures, physical abuse, and other causes. Provide temporary coverings or enclosures where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

END OF SECTION 07210

SECTION 07270

FIRESTOPPING

PART 1-GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section requires firestopping for the following:

1. Penetrations through fire-resistance-rated floor and roof construction including both empty openings and openings containing cables, pipes, ducts, conduits, and other penetrating items.

2. Penetrations through fire-resistance-rated walls and partitions including both empty openings and openings containing cables, pipes, ducts, conduits, and other penetrating items.

3. Sealant joints in fire-resistance-rated construction

1.3 SYSTEM PERFORMANCE REQUIREMENTS

A. General: Provide firestopping systems that are produced and installed to resist the spread of fire, according, to requirements indicated, and the passage of smoke and other gases.

B. Fire-Resistive Joint Sealants: Provide joint sealants with fire-resistance ratings indicated, as determined per ASTM E 119, but not less than that equaling or exceeding the fire-resistance rating of the construction in which the joint occurs.

1.4 SUBMITTALS

A. Product certificates signed by manufacturers of firestopping products certifying that their products comply with specified requirements.

1.5 QUALITY ASSURANCE

A. Fire-Test-Response Characteristics: Provide firestopping that complies with the following requirements and those specified under the "System Performance Requirements" article.

b. Ceramic fiber.

c. Sealants used in combination with other forming/damming materials to prevent leakage of fill materials in liquid state.

d. Fire-rated formboard.

e. Joint fillers for joint sealants.

2. Temporary forming materials.

3. Substrate primers.

4. Collars.

5. Steel sleeves.

C. Applications: Provide firestopping systems composed of materials specified in this Section that comply with system performance and other requirements.

2.2 FILL MATERIALS FOR THROUGH-PENETRATION FIRESTOP SYSTEMS

A. Ceramic-Fiber and Mastic Coating: Ceramic fibers in bulk form formulated for use with mastic coating, and ceramic fiber manufacturer's mastic coating.

B. Ceramic-Fiber Sealant: Single-component formulation of ceramic fibers and inorganic binders.

C. Endotbermic, Latex Compound Sealant: Single-component intumescent, latex formulation.

D. Intumescent, Latex Sealant: Single-component, intumescent, latex formulation.

E. Intumescent Putty: Nonhardening, dielectric, water-resistant putty containing no solvents, inorganic fibers, or silicone compounds.

2.3 FIRE-RESISTIVE ELASTOMERIC JOINT SEALANTS

A. Elastomeric Sealant Standard: Provide manufacturer's standard chemically curing, elastomeric sealants of base polymer indicated that complies with ASTM C 920 requirements, including those referenced for Type, Grade, lass, and Uses, and, requirements specified in this Section applicable to fire-resistive joint sealants.

B. Single-Component, Neutral-Curing Silicone Sealant: Type S; Grade NS; Class 25; exposure-related Use NT, and joint-substrate-related Uses M, G, A, and (as applicable to joint substrates indicated) 0.

1. Additional Movement Capability: Provide sealant with the capability to withstand the following percentage chances in joint width existing at time of installation, when tested for adhesion and cohesion under maximum cyclic movement per

primers to areas of bond; do not allow spillage and migration onto exposed surfaces.

C. Masking Tape: Use masking tape to prevent firestopping from contacting adjoining surfaces that will remain exposed upon completion of Work and that would otherwise be permanently stained or damaged by such contact or by cleaning methods used to remove smears from firestopping materials. Remove tape as soon as it is possible to do so without disturbing firestopping's seal with substrates.

3.3 INSTALLING THROUGH-PENETRATION FIRESTOPS

A. General: Comply with the "System Performance Requirements" article in Part 1 and the through penetration firestop manufacturer's installation instructions and drawings pertaining to products and applications indicated.

B. Install forming/damming materials and other accessories of types required to support fill materials during their application and in the position needed to produce the cross-sectional shapes and depths required to achieve fire ratings of designated through-penetration firestop systems. After installing fill materials, remove combustible forming materials and other accessories not indicated as permanent components of firestop systems.

C. Install fill materials for through-penetration firestop systems by proven techniques to produce the following results:

1. Completely fill voids and cavities formed by openings, forming materials, accessories, and penetrating items.

2. Apply materials so they contact and adhere to substrates formed by openings and penetrating items.

3. For fill materials that will remain exposed after completing Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

3.4 INSTALLING FIRE-RESISTTVE JOINT SEALANTS

A. General: Comply with the "System Performance Requirements" article in Part f, - with ASTM C 1193, and with the sealant manufacturer's installation instructions and drawings pertaining to products and applications indicated.

B. Install joint fillers to provide support of sealants during application and at position required to produce the cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability and develop fire-resistance rating required.

C. Install sealants by proven techniques that result in sealants directly contacting and fully wetting joint substrates, completely recesses provided for each joint configuration, and providing uniform, cross-sectional shapes and depths relative

SECTION 07901
JOINT SEALANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes joint sealants for the following locations:

1. Exterior joints in vertical surfaces and nontraffic horizontal surfaces as indicated below:

a. Control and expansion joints in cast-in-place concrete.

b. Joints between dissimilar materials

c. Perimeter joints between materials listed above and frames of doors and windows.

d. Other joints as indicated.

2. Interior joints in vertical surfaces and horizontal nontraffic surfaces as indicated below:

a. Perimeter joints of exterior openings where indicated.

b. Perimeter joints between interior wall surfaces and frames of interior doors, windows, and elevator entrances.

c. Other joints as indicated.

B. Related Sections: The following Sections contain requirements that relate to this Section:

1. Division 7 Section "Exterior Insulation and Finish Systems - Class PB" for sealing system joints.

2. Division 7 Section "Exterior Insulation and Finish Systems - Class PM" for sealing system joints.

C. Joint Substrate Conditions: Do not proceed with installation of joint sealants until contaminants capable of interfering with their adhesion are removed from joint substrates.

1.8 SEQUENCING AND SCHEDULING

A. Sequence installation of joint sealants to occur not less than 21 nor more than 30 days after completion of waterproofing, unless otherwise indicated.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

A. Compatibility: Provide joint sealants, joint fillers, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.

B. Colors: Provide color of exposed joint sealants to comply with the following:

1. Provide selections made by Architect from manufacturer's full range of standard colors for products of type indicated.

2.2 ELASTOMERIC JOINT SEALANTS

A. Description of Joint Construction and location where sealant is typically applied:
1. Exterior and interior joints in vertical surfaces, between concrete masonry, between metal and concrete, mortar, or stone: interior and exterior perimeter joints of metal frames in exterior wall, exterior overhead joints.

B. Elastomeric Sealant Standard: Provide manufacturer's standard chemically curing elastomeric sealants that comply with ASTM C 920 and other requirements indicated on each Elastomeric Joint Sealant Data Sheet at end of this Section, including those requirements referencing ASTM C 920 classifications for Type, Grade, Class, and Uses.

1. Additional Movement Capability:_ Where additional movement capability is specified in Elastomeric Joint Sealant Data Sheet, provide products with the capability, when tested for adhesion and cohesion under maximum cyclic movement per ASTM C 719, to withstand the specified percentage change in the joint width existing at time of installation and remain in compliance with other requirements of ASTM C 920 for Uses indicated.

C. Available Products: Subject to compliance with requirements, elastomeric sealants that may be incorporated in the Work include, but are not limited to, the products specified in each Elastomeric Sealant Data Sheet.

D. Products: Subject to compliance with requirements, provide one of the products specified in each Elastomeric Joint Sealant Data Sheet.

b. "Sonolac," Sonneborn Building Products Div., ChemRex, Inc.

c. "Tremco Acrylic Latex 834," Tremco, Inc.

2. Silicone-Emulsion Sealant:

a. "Trade Mate Paintable Glazing Sealant," Dow Corning Corp.

2.5 JOINT SEALANT BACKING

A. General: Provide sealant backings of material and type that are nonstaining; are compatible with joint substrates, sealants, primers and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

B. Plastic Foam Joint Fillers: Preformed, compressible, resilient, nonstaining, nonwaxing, nonextruding strips of flexible plastic foam of material indicated below and of size, shape, and density to control sealant depth and otherwise contribute to producing optimum sealant performance:

1. Open-cell polyurethane foam.

2. Closed-cell polyethylene foam, nonabsorbent to liquid water and gas, nonoutgassing in unruptured state.
3. Proprietary, reticulated, closed-cell polymeric foam, nonoutgassing, with a density of 2.5 pcf and tensile strength of 35 psi per ASTM D 1623, and with water absorption less than 0.02 gms/cc per ASTM C 1083.

4. Any material indicated above.

C. Elastomeric Tubing Joint Fillers: Neoprene, butyl, EPDM, or silicone tubing complying with ASTM D 1056, nonabsorbent to water and gas, capable of remaining resilient at temperatures down to -26 deg F (-32 deg C). Provide products with low compression set and of size and shape to provide a secondary seal, to control sealant depth, and otherwise contribute to optimum sealant performance.

D. Bond-Breaker Tape: Polyethylene tape or other plastic tape as recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

2.9 MISCELLANEOUS MATERIALS

A. Primer: Material recommended by joint sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint sealant-substrate tests and field tests.

recommendations. Confine primers to areas of joint sealant bond; do not allow spillage or migration onto adjoining surfaces.

C. Masking Tape: Use masking tape where required to prevent contact of sealant with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALANTS

A. General: Comply with joint sealant manufacturer's printed installation instructions applicable to products and applications indicated, except where more stringent requirements apply.

B. Sealant Installation Standard: Comply with recommendations of ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

C. Acoustical Sealant Application Standard: Comply with recommendations of ASTM C 919 for use of joint sealants in acoustical applications as applicable to materials, applications, and conditions indicated.

D. Installation of Sealant Backings: Install sealant backings to comply with the following requirements:

1. Install joint fillers of type indicated to provide support of sealants during application and at position required to produce the cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

    a. Do not leave gaps between ends of joint fillers.

    b. Do not stretch, twist, puncture, or tear joint fillers.

    c. Remove absorbent joint fillers that have become wet prior to sealant application and replace with dry material.

2. Install bond breaker tape between sealants where backer rods are not used between sealants and joint fillers or back of joints.

D. Installation of Sealants: Install sealants by proven techniques that result in sealants directly contacting and fully wetting joint substrates, completely filling recesses provided for each joint configuration, and providing uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability. Install sealants at the same time sealant backings are installed.

E. Tooling of Nonsag Sealants: Immediately after sealant application and prior to time skinning or curing begins, tool sealants to form smooth, uniform beads of configuration indicated, to eliminate air pockets, and to ensure contact and adhesion of sealant with sides of joint. Remove excess sealants from surfaces

SECTION 08111

STEEL DOORS AND FRAMES AND WOOD DOORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following products manufactured in accordance with SDI & AWI Recommended Standards:

1. The following products manufactured in accordance with SDI & AWI recommendation standards.

a. Frames: Pressed steel frames for doors, borrowed lights, and other openings of following type:

1) Welded unit type.

2) Knockdown field assembled type only where specifically indicated.

b. Assemblies: Provide standard steel door and frame assemblies as required for the following:

1) Labeled and fire rated.

c. Provide factory primed frames and metal doors to be field painted.

2. Wood flush doors.

B. Related Sections: The following sections contain requirements that relate to this section

1. Painting primed doors and frames and clear coating wood doors is specified in Division 9 Section "Painting."

2. Door hardware is specified in another Division 8 Section.

3. Glass and Glazing are specified in another Division 8 Section.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering standard steel doors and frames which may be incorporated in the work include; but are not limited to, the following:

1. Standard Steel Doors and Frames:

a. Ceco Corp.

b. Curries Company.

c. Fenestra Corp.

d. Kewanee Corp.

e. Republic Builders Products.

f. Steelcraft Manufacturing Co.

2. Wood Flush Doors

a. Mohawk

2.2 MATERIALS

A. Cold-Rolled Steel Sheets: Commercial quality carbon steel, complying with ASTM A 366 and ASTM A 568.

B. Supports and Anchors: Fabricate of not less than 18-gage sheet steel; galvanized where used with galvanized frames.

C. Inserts, Bolts, and Fasteners: Manufacturer's standard units. Where items are to be built into exterior walls, hot-dip galvanize in compliance with ASTM A 153, Class C or D as applicable.

D. Shop Applied Paint: Apply after fabrication.

1. Primer: Rust-inhibitive enamel or paint, either air-drying or baking, suitable as a base for specified finish paints complying with ANSI A224.1, "Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames."

2.3 FRAMES

A. Provide metal frames for doors, transoms, sidelights, borrowed lights, and other openings, of types and styles as shown on drawings and schedules. Conceal

B. Fabricate exposed faces of doors and panels from only cold rolled steel sheet

C. Tolerances: Comply with SDI 117 "Manufacturing Tolerances Standard Steel Doors and Frames."

D. Fabricate concealed stiffeners, reinforcement, edge channels, louvers and moldings from either cold-rolled or hot-rolled steel.

E. At all exterior locations fabricate doors, panels, & frames from galvanized steel sheet according to SDI 112. Close top and bottom edges of doors with .0635 inch thick galvanized channels with channel webs placed even with top & bottom edges. Seal joints against water penetration.

F. Exposed Fasteners: Unless otherwise indicated, provide countersunk flat or oval heads for exposed screws and bolts.

G. Hardware Preparation: Prepare doors and frames to receive mortised and concealed hardware in accordance with final Door Hardware Schedule and templates provided by hardware supplier. Comply with applicable requirements of ANSI A115 Series Specifications for door and frame preparation for hardware.

H. Reinforce doors and frames to receive surface applied hardware. Drilling and tapping for surface applied hardware may be done at project site.

I. Locate hardware as indicated on final shop drawings or, if not indicated, in accordance with "Recommended Locations for Builder's Hardware on Standard Steel Doors and Frames," published by Door and Hardware Institute.

J. Shop Painting: Clean, treat, and paint exposed surfaces of steel door and frame units, including galvanized surfaces.

1. Clean steel surfaces of mill scale, rust, oil, grease, dirt, and other foreign materials before application of paint.

2. Apply shop coat of prime paint of even consistency to provide a uniformly finished surface ready to receive finish paint.

K. Glazing Stops: Minimum 20 gage steel or .040-inch-thick aluminum.

1. Provide non-removable stops on outside of exterior doors and on secure side of interior doors for glass, louvers, and other panels in doors.
2. Provide screw applied removable glazing beads on inside of glass, louvers, and other panels in doors.

2.5 FLUSH WOOD DOORS

A. Quality Standard: Comply with AWI Section for Flush Wood Doors.

B. Wood Flush Doors: Comply with the following requirements:

1. Install fire-rated doors with clearances as specified in NFPA Standard No. 80.

3.2 ADJUST AND CLEAN

A. Prime Coat Touch-up: Immediately after erection, sand smooth any rusted or damaged areas of prime coat and apply touch-up of compatible air-drying primer.

B. Protection Removal: Immediately prior to final inspection, remove protective plastic wrappings from prefinished doors.

C. Final Adjustments: Check and readjust operating hardware items, leaving steel doors and frames undamaged and in complete and proper operating condition.

End Of Section

SECTION 08305

ACCESS DOORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following types of access doors for installation in the following types of construction:

1. Gypsum drywall.

1.3 SUBMITTALS

A. General: Submit each item in this Article according to the Conditions of Contract and Division 1 Specification Sections.

1. Product data for each type of access door assembly specified, including details of construction relative to materials, individual components, profiles, finishes, and fire-protection ratings (if required).

a. Include complete schedule, including types, general locations, sizes, wall and ceiling construction details, latching or locking provisions, and other data pertinent to installation.

1.4 QUALITY ASSURANCE

A. Single-Source Responsibility: Obtain access doors for entire Project from one source and by a single manufacturer.

B. Fire Resistance Rating: Wherever a fire resistance classification is indicated, provide access door assembly with panel door, frame, hinge, and latch from manufacturer listed in Underwriters Labrotories, Inc. "s " Building Materials Directory" for rating shown.

C. Size Variations: Obtain Architect's acceptance of manufacturer's standard size units, which may vary slightly from sizes indicated.

D. Flush Panel Doors: Fabricate from not less than 14 gage sheet steel, with concealed spring hinges or concealed continuous piano hinge set to open 175 degrees. Finish with manufacturer's factory applied prime paint.

E. Locking Devices: Furnish flush, screwdriver operated cam locks of number required to hold door in flush, smooth plane when closed.

PART 3 - EXECUTION

3.1 EXECUTION

A. Furnish access doors of appropriate size at all locations where access of concealed plumbing or mechanical devices is required by code and where ever else indicated

B. Comply with manufacturer's instructions for installing access doors.

C. Coordinate installation with work of other trades.

3.2 ADJUST AND CLEAN

A. Adjust hardware and panels after installation for proper operation.

B. Remove and replace panels or frames that are warped, bowed, or otherwise damaged.

End Of Section

SECTION 08360

SECTIONAL OVERHEAD DOORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawing and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this section.

1.2 SUMMARY

A. This Section includes sectional overhead doors, as follows:

1. Steel frame and steel panels.

2. Manually operated doors.

1.3 SUBMITTALS

A. General: Submit the following according to Conditions of the Contract and Division 1 Specification Sections.

B. Product data, roughing-in diagrams, and installation instructions for each type and size of overhead door. Include manufacturer's operating instructions and maintenance data.

C. Shop drawings for special components and installations which are not fully dimensioned or detailed in manufacturer's data.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: Provide each sectional overhead door as a complete unit produced by a single manufacturer, including frames, sections, brackets, guides, tracks, counterbalance mechanisms, hardware, operators, and installation accessories.

B. Inserts and Anchorages: Provide setting drawings, templates, and directions for installation of anchorage devices. Coordinate delivery with other work to avoid delay.

E. Insulate inner core of steel sections where indicated with manufacturer's standard polystyrene, or polyurethane-foam type insulation.

1. Enclose insulation with manufacturer's standard steel sheet secured to door panel.

F. Finish door sections as follows:

1. Apply manufacturer's standard prime and finish coats, applied to interior and exterior door faces.

2. Color white.

G. At doors **108E** and **108G** provide manufacturer's complete exhaust ventilation kits designed to direct vehicle exhaust through a flexible tube through a small diameter hole in the overhead door. Provide hole closures when not in use.

2.3 TRACKS, SUPPORTS, AND ACCESSORIES

A. Tracks: Provide manufacturer's standard, galvanized-steel track system, sized for door size and weight, and designed for clearances shown. Provide complete track assembly including brackets, bracing and reinforcing for rigid support of ball-bearing roller guides for required door type and size. Slot vertical sections of track at 2 inches o.c. for door-drop safety device. Slope tracks at proper angle from vertical, or otherwise design to ensure tight closure at jambs when door unit is closed. Weld or bolt to track supports.

B. Track Reinforcement and Supports: Provide galvanized-steel track reinforcement and support members. Secure, reinforce and support tracks as required for size and weight of door to provide strength and rigidity without sag, sway, and vibration during opening and closing of doors.

C. Support and attach tracks to opening jambs with continuous angle welded to tracks and attached to wall. Support horizontal (ceiling tracks) with continuous angle welded to track and supported by laterally braced attachments to overhead structural members at curve and end of tracks.

D. Weather Seals: Provide continuous rubber, neoprene, or flexible vinyl adjustable weather-strip gasket at tops and compressible astragal on bottoms of each overhead door.

1. In addition, provide continuous flexible seals at door jamb edges for a fully weather-tight installation.

E. Vision Panels: Provide clear float-glass or plastic vision panels in arrangement shown. Set glass in rubber or neoprene channel glazing strips for metal-framed

B. Provide cast-aluminum or grey-iron casting cable drums, grooved to receive cable. Mount counterbalance mechanism with manufacturer's standard ball-bearing brackets at each end of shaft. Provide one additional midpoint bracket for shafts up to 16 feet long and two additional brackets at one-third points to support shafts over 16 feet long, unless closer spacing recommended by door manufacturer.

C. Include a spring-loaded, steel or bronze cam mounted to bottom door roller assembly on each side, designed to automatically stop door if either cable breaks.

D. Provide a spring bumper at each horizontal track to cushion door at end of opening operation.

2.6 MANUAL DOOR OPERATION

A. Push-Up: Provide lift handles and pull rope for raising and lowering doors, operating with not more than 25 lb lift or pull.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General: Install door, track, and operating equipment complete with necessary hardware, jamb and head mold stops, anchors, inserts, hangers, and equipment supports according to shop drawings, manufacturer's instructions, and as specified.

B. Fasten vertical track assembly to framing at not less than 24 inches o.c. Hang horizontal track from structural overhead framing with angle or channel hangers, welded and bolt-fastened in place. Provide sway bracing, diagonal bracing, and reinforcing as required for rigid installation of track and door-operating equipment.

C. After completing installation, including work by other trades, lubricate, test, and adjust doors to operate easily, free from warp, twist, or distortion and fitting weather-tight for entire perimeter.

END OF SECTION 08360

SECTION 08700 - FINISH HARDWARE

PART I - GENERAL

1.01 Work Included:

a. Furnish and install finish hardware for all doors including:

1. Door silencers for all frames
2. Key storage cabinet
3. Weatherstripping and thresholds
4. Door bottoms sound seals

1.02 Related Work:

a. Section 08110 Hollow Metal Work
b. Section 08800 Glazing
c. Section 09900 Painting
d. Division 16 Electrical

1.03 Quality Assurance:

a. The hardware supplier shall have in his employ an architectural hardware consultant (AHC) or a person with equivalent number of years required for AHC qualifications. This person shall be recognized as having the ability to be fully responsible for the scheduling, detailing and execution of this section of the specifications and related items. This qualified consultant shall be responsible for processing all submissions, correspondence, technical matters related to the finish hardware and it's application specified in this section.

1.04 References:

References specified in this section subject to compliance as directed:

a. NFPA-80-1992 - Standard for Fire Doors and Windows
b. NFPA-101-1994 - Life Safety Code
c. ADA, The Americans with Disabilities Act - Title III - Public Accommodations
d. ANSI-A 117.1 - American National Standards Institute - Accessible and Usage Buildings and Facilities
e. ANSI-A156.5 - American National Standards Institute - Auxiliary Locks and Associated Products
f. UFAS - Uniform Federal Accessibility Standards
g. UL - Underwriter's Laboratories

h. WHI - Warnock Hersey International, Division of Inchcape Testing Services

i. State and Local Codes including Authority having Jurisdiction

1.05 Submittals:

a. The hardware supplier shall, if requested, submit for approval one sample of each of the hardware items listed prior to receiving approval of the finish hardware schedule. The approved samples shall be available for installation as part of the project, if the supplier determines it to be in his best interest to do so.

b. The finish hardware supplier shall submit for approval a complete and detailed finish hardware schedule using a vertical typewritten format. The finish hardware schedule shall contain a listing of the name of each manufacturer and the product listing for the series included in the hardware schedule.

c. It shall be the responsibility of the finish hardware supplier to obtain from the owner or the owner's representative, a detailed keying schedule listing the respective key symbol and location for the locksets having the corresponding key symbol.

d. Provide six (6) regular copies of the finish hardware schedule for approval.

1.06 Delivery, Storage and Handling:

a. The finish hardware shall be delivered to the jobsite and received there by the general contractor. The general contractor shall prepare a locked storage room with adequate shelving, for all hardware. The storage room shall be in a dry, secure area, and shall not include storage of other products by other trades.

b. All finish hardware shall have the necessary screws, bolts and other fastenings required for correct installation of each item. The cylinders, locksets, exit devices and door closers shall be clearly marked with the respective individual door or heading number.

5. Refer to finish section for hinge finish.

B. **MORTISE LEVER HANDLE LOCKSETS:**

1. Locksets for this project shall be mortise type with solid cast stainless steel lever handle sectional trim.

2. The lockset case shall be 12 gauge heavy duty wrought steel with zinc dichromate finish.

3. Locksets shall have a simple reversibility of the hand by utilizing a screwdriver without disassembly of the lock case.

4. Latchbolt shall be a stainless steel 3/4" one-piece, anti-friction and reversible.

5. Strikes shall be non-handed curved lip stainless steel ANSI Standard A115.1, 4 7/8" x 1 1/4".

6. Locks and cylinders shall be manufactured and supplied by the same manufacturers. All locksets and cylinders for this project shall be manufactured in the United States of America by a recognized and reputable lock manufacturer.

7. The following is a guide to the manufacturers and designs acceptable for this project.

Schlage	L9000	Series	06L Design
Sargent	8200	Series	LNL Design
Corbin/Russwin	ML2200	Series	NSA Design

8. The following is a list of lock functions as indicated under "hardware sets":

FUNCTION	CORBIN/ RUSSWIN	SARGENT	SCHLAGE
A	57	04	80
B	51	05	53
C	10	15	10
D	55	37	70
E	54	16	60
F	20	65	40

C. **KEYING:**

1. All cylinders and locksets shall be keyed to the existing restricted Sargent keyway per the Owners instructions.

3. The hardware contractor shall insert in the hardware schedule, beside each door listing, the required degree of opening for each door. If the door swing is over 140 degrees, parallel arm type closers shall be used. Door closers mounted on corner brackets, or top jamb application, shall not be permitted.

4. Provide hold open arms, where specified, in accordance with the hardware set numbers.

5. Door closers with cush-n-stop arms shall be provided for all exterior, out-swing doors and other openings as specified under hardware sets. They shall have heavy forged steel parallel arms and soffit plates attached to the frame by six (6) screws. The forged steel arm shall have a positive stop bracket with an adjustable tension hold-open feature controlled with a slotted screw or control knob, permitting adjustment from no hold-open to full restraint of door movement.

6. Where door closers are noted to require delayed action feature, provide closers as specified herein, but having a separate delayed action valve, to permit adjustment of delayed action cycle. When adjusted, the door closer shall close at a controlled rate of speed, through the delayed action cycle range.

7. The installing contractor shall be responsible for proper installation of door closers in accordance with degree of opening indicated on hardware schedule. The installing contractor shall be responsible for adjustment of the three individual valves, for proper control as follows:
   1- closing speed,
   2- latching speed,
   3- delayed action, or backcheck.

   Spring power adjustments, shall also be the responsibility of the installing contractor as set forth in Part III Execution.

8. Where top rail of door is insufficient in width to mount the closer directly to the rail, drop brackets shall be provided.

I. **FLUSH BOLTS:**

1. Extension flush bolts shall have forged bronze face plate with extruded brass lever and with wrought brass guide and strike. Rods for flush bolts shall be 12" steel or brass for doors up to 7'-6" in height. Where doors are over 7'-6" in height the flush bolt rod length shall be increased in increments of 6" for each 6" of additional door height. Plate size shall be 6 3/4" x 1" to meet ANSI A115 and SDI specifications. Bolt projection shall be 5/8".

2. Floor strikes for flush bolts shall be dustproof type cast or extruded bronze with cast bronze floor plate minimum 3 1/2" x 1 5/8" with masonry anchors for concrete floors. Provide a dustproof strike, for sill application, for all bottom flush bolts for all pairs of doors.

3. The following products will be acceptable:

Ives	- 458
Glynn Johnson	- FB6
Hager	- 282D

J. **THRESHOLD - WEATHERSTRIPPING - DOOR BOTTOMS:**

1. For all exterior doors not requiring floor closers, provide a flat extruded or cast aluminum threshold 5" wide by full width of door opening. Threshold shall be 1/2" high and shall have beveled edges and a corrugated surface. Anchor thresholds with no less than four (4) machine screw anchors for 3'0" lengths. Provide #10 1 1/2" FH zinc plated screws.

2. For all exterior hollow metal doors, provide an extruded aluminum perimeter seal with neoprene gasketing material (weatherstripping) for head and jambs. The neoprene seals shall be an airfoil design to permit full and positive closure between door and jamb. The continuous aluminum brackets shall be applied on the stop with stainless steel sheet metal screws at the corner of the rabbett located so as to provide full closure at the head and jamb perimeters. Where the door comes in contact with the frame, the maximum projection for the continuous aluminum weatherstripping brackets shall be no more than 1/4".

HW 2

Opening 101B
Each to Have: Hinges, Lockset (Function D), Closer, Kick Plate, Stop, Silencers

HW 3

Opening 102A
Each to Have: Hinges, Lockset (Function B), Stop, Silencers

HW 4

Opening 103A, 110A
Each to Have: Hinges, Lockset (Function A), Closer, Stop, Silencers

HW 5

Opening 104A, 105A
Each to Have: Hinges, Privacy Lockset (Function E), Stop, Silencers

HW 6

Openings 108G, 108E, 108F, 111B, 1l1C, and 111D
Each to have: Lock Cylinders

HW 7

Opening 108D
Each to Have: Hinges, Latchset (Function 3), Flush Bolts, Stops, Threshold, Weatherstrip, Door Bottom

HW 8

Opening 109A
Each to Have: Hinges, Latchset (Function 3), Flush Bolts, Closers, Stops, Silencers

HW 9

Opening 106A
Each to Have: Cylinder as Required
Balance of Hardware by Security Gate

d. The adjustments for all door closers shall be the contractor's responsibility and these adjustments shall be made at the time of installation of the door closer. The closing speed and latching speed valves, shall be adjusted individually to provide a smooth, continuous closing action without slamming. The delayed action feature or back check valve shall also be adjusted so as to permit the corrected delayed action cycle or hydraulic back check cushioning of the door in the opening cycle. All valves must be properly adjusted at the time of installation. Each door closer has adjustable spring power capable of being adjusted, in the field, from size 2 thru 6. It shall be the contractors responsibility to adjust the spring power for each door closer in exact accordance with the spring power adjustment chart illustrated in the door closer installation sheet packed with each door closer.

e. Installation of all other hardware, including locksets, push-pull latches, overhead holders, door stops, plates and other items, shall be carefully coordinated with the hardware schedule and the manufacturers instruction sheets.

f. Locations for finish hardware shall be in accordance with dimensions listed in the pamphlet "Recommended locations for Builders' Hardware" published by the Door and Hardware Institute.

3.04 FIELD QUALITY CONTROL

a. Upon completion of the installation of the finish hardware, it shall be the responsibility of the finish hardware supplier to visit the project and to examine the hardware for each door on which he has provided hardware and to verify that all hardware is in proper working order. Should he find items of hardware not operating properly, he should make a report, in writing, to the general contractor, advising him of the problem and the measures required to correct the problem.

SECTION 08800

GLAZING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes glazing for the following products, including those specified in other Sections where glazing requirements are specified by reference to this Section:

1. Vision lites. In doors

2. Borrowed lites

B. Vision lites in overhead doors are specified in another Division 8 Specification.

C. Exterior window glazing is specified in another Division 8 Specification.

1.3 DEFINITIONS

A. Manufacturer is used in this Section to refer to a firm that produces primary glass or fabricated glass as defined in the referenced glazing standard.

1.4 SYSTEM PERFORMANCE REQUIREMENTS

A. General: Provide glazing systems that are produced, fabricated, and installed to withstand normal thermal movement, wind loading, and impact loading (where applicable), without failure including loss or glass breakage attributable to the following: defective manufacture, fabrication, and installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; and other defects in construction.

B. Glass Design: Glass thicknesses indicated on Drawings are for detailing only. Confirm glass thicknesses by analyzing Project loads and in-service conditions. Provide glass lites for the various size openings in the thicknesses and strengths (annealed or heat-treated) to meet or exceed the following criteria:

1.5 SUBMITTALS

A. General: Submit the following according to Conditions of Contract and Division 1 Specification Sections.

2.2 PIMARY FLOAT GLASS PRODUCTS

A. Float Glass: ASTM C 1036, Type I (transparent glass, flat). Class as indicated below, and Quality q3 (glazing select)

B. Clear 1 (clear): unless otherwise indicated,

1. ¼" unless otherwise indicated.

2.3 HEAT TREATED FLOAT GLASS PRODUCTS, GENERAL

A. Fabrication Process: By vertical (tong-held)or horizontal (roller-hearth) process, at manufacturer's option, except provide horizontal process where indicated as tongless or free of tong marks.

2.4 HEAT-TREATED FLOAT GLASS

A. Uncoated, Clear, Heat-Treated Float Glass: ASTM C 1048, Condition A (uncoated surfaces), Type I (transparent glass, flat), Class 1 (clear), Quality q3 (glazing select), kind as indicated below.

1. Kind FT (fully tempered) where indicated and at all door lites and where required by code.

a. ¼" thick, unless otherwise indicated

B. Manufacturers: Subject to compliance with requirements, provide heat-treated glass by one of the following companies.

1. AFG Industries, Inc.
2. Artistic Glass Products Co.
3. Cardinal IG.
4. Saint-Gobain.
5. Falconer Glass Industries.
6. Glasstemp, Inc.
7. Guardian Industries Corp.
8. HGP Industries.
9. PPG Industries, Inc.
10. Spectrum Glass Products, Inc.

b. Schnee-Morehead, Inc.

c. Tremco, Inc.

2.7 MISCELLANEOUS GLAZING MATERIALS

A. General: Provide products of material, size, and shape complying with referenced glazing standard, requirements of manufacturers of glass and other glazing materials involved for glazing application indicated, and with a proven record of compatibility with surfaces contacted in installation.

B. Cleaners, Primers and Sealers: Type recommended by sealant or gasket manufacturer.

2.8 FABRICATION OF GLASS AND OTHER GLAZING PRODUCTS

A. Fabricate glass and other glazing products in sizes required to glaze openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with recommendations of product manufacturer and referenced glazing standard as required to comply with system performance requirements.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine glass framing, with glazier present, for compliance with the following:

1. Manufacturing and installation tolerances, including those for size, squareness, offsets at corners.

2. Minimum required face or edge clearances.

3. Effective sealing between joints of glass-framing members.

B. Do not proceed with glazing until unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings that are not firmly bonded to substrates.

3.3 GLAZING, GENERAL

A. Comply with combined recommendations of manufacturers of glass, sealants, gaskets, and other glazing materials, except where more stringent requirements are indicated, including those in referenced glazing publications.

B. Secure compression gaskets in place with joints located at corners to compress gaskets producing a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.

C. Install gaskets so they protrude past face of glazing stops.

3.5 PROTECTION AND CLEANING

A. Protect glass from breakage after installation. Remove nonpermanent labels, and clean surfaces.

B. Protect glass from contact with contaminating substances resulting from construction operations including weld splatter. If, despite such protection, contaminating substances do come into contact with glass, remove them immediately as recommended by glass manufacturer.

C. Remove and replace glass that is broken, chipped, cracked, abraded, or damaged in any way, including natural causes, accidents and vandalism, during construction period.

D. Wash glass on both faces in each area of Project not more than 4 days prior to date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended by glass manufacturer.

END OF SECTION

SECTION 09255

GYPSUM BOARD ASSEMBLIES

PART I - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Gypsum board assemblies attached to wood framing.

B. Related Sections: The following Sections contain requirements that relate to this Section:

1. Division 6 Section "Rough Carpentry"

2. Division 7 Section "Firestopping" for firestopping systems and fire-resistive-rated joint sealants.

1.3 DEFINITIONS

A. Gypsum Board Construction Terminology: Refer to ASTM C 11 and GA-505 for definitions of terms related to gypsum board assemblies not defined in this Section or in other referenced standards.

1.4 SUBMITTALS

A. General: Submit the following according to Conditions of the Contract and Division 1 Specification Sections.

B. Product data for each type of product specified.

C. Product certificates signed by manufacturers of gypsum board assembly components certifying that their- products comply with specified requirements.

1.5 QUALITY ASSURANCE

A. Fire-Test-Response Characteristics: Where fire-rated gypsum board assemblies are indicated, provide materials and construction identical to those of assemblies tested for fire resistance per ASTME E 119 by an independent testing and inspecting agency acceptable to authorities having Jurisdiction.

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:

1. Gypsum Board and Related Products:

a. Domtar Gypsum.

b. Georgia-Pacific Corp.

c. Gold Bond Building Products Div., National Gypsum Co.

d. United States Gypsum Co.

2.4 GYPSUM BOARD PRODUCTS

A. General: Provide gypsum board of types indicated in maximum lengths available to minimize end-to-end butt joints.

B. Gypsum Wallboard: ASTM C 36 and as follows:

1. Regular unless otherwise noted.

2. Type: Type X where required for fire-resistive-rated assemblies.

3. Thickness: ½" unless otherwise indicated.

4. Thickness: 5/8 inch for type 'X' and at all ceilings.

5. Edges: Tapered.

2.5 TRIM ACCESSORIES

A. Accessories for Interior Installation: Corner beads, edge trim, and control joints complying with ASTM C 1047 and requirements indicated below:

1. Material: Formed metal or metal combined with paper, with metal complying with the following requirement:

a. Sheet steel coated with zinc by hot-dip or electrolytic processes, or with aluminum or rolled zinc.

2. Shapes indicated below by reference to Fig. 1 designations in ASTM C 1047:

a. Corner bead on outside corners, unless otherwise indicated.

A. Latex Acoustical Sealant: Manufacturer's standard nonsag, paintable nonstaining latex sealant complying with ASTM C 834 and the following requirements:

1. Product is effective in reducing airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies per ASTM E 90.

2.8 MISCELLANEOUS MATERIALS

A. General: Provide auxiliary materials for gypsum board construction that comply with referenced standards and recommendations of gypsum board manufacturer.

B. Laminating, Adhesive: Special adhesive or joint compound recommended for laminating gypsum panels.

C. Spot Grout: ASTM C 475, setting-type joint compound recommended for spot grouting hollow metal door frames.

D. Steel drill screws complying with ASTM C 1002 for the following applications:

1. Fastening gypsum board to steel members less than 0.03 inch thick.

2. Fastening gypsum board to gypsum board or plaster.

E. Steel drill screws complying with ASTM C 954 for fastening gypsum board to steel members from 0.033 to 0.112 inch thick.

F. Corrosion-resistant-coated steel drill screws of size and type recommended by board manufacturer for fastening exterior gypsum sheathing.

G. Thermal Insulation: Material indicated below, of thickness and width to fill voids formed by Z-furring members:

1. Unfaced Mineral-Fiber Blanket Insulation: Unfaced mineral fiber blanket insulation produced by combining mineral fibers of type described below with thermosetting resins to comply with ASTM C 665 for Type I (blankets without membrane facing):

a. Mineral-Fiber Type: Fibers manufactured from glass.

H. Wood Blocking: Provide wood blocking where indicated between studs for application of wood trim, and other surface applied items and at openings as indicated.

PART 3 - EXECUIION

J. Cover both faces of stud partition framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chase walls that are braced internally.

1. Except where concealed application is indicated or required for fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. in area.

2. Fit gypsum panels around ducts, pipes, and conduits.

3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by coffers, joists, and other structural members; allow 1/4-to-1/2-inch-wide joints to install sealant.

K. Isolate perimeter of non-load-bearing gypsum board partitions at structural abutments, except floors, as detailed or as follows: Provide 1/4-inch-to-1/2-inch-wide spaces at these locations and trim edges with LC-bead edge trim where edges of gypsum panels are exposed. Seal joints between edges and abutting structural surfaces with sealant.

1. Provide isolation joint at all locations where gypsum board partitions intersect materials other than gypsum board or plaster.

L. Space fasteners in gypsum panels according to referenced gypsum board application and finishing standard and manufacturer's recommendations.

3.3 GYPSUM BOARD APPLICAUON METHODS

A. Single-Layer Application: Install gypsum wallboard panels as follows:

1. On partitions/walls, apply gypsum panels vertically (parallel to framing), unless otherwise indicated, and provide panel lengths that will minimize end joints.

B. Single-Layer Fastening Methods: Apply gypsum panels to supports as follows:

1. Fasten with screws.

C. Double-Layer Fastening Methods: Apply face layer of gypsum panels to existing base layer or plaster as follows:

1. Fasten face layers with screws and adhesive.

3.4 INSTALLING TRIM ACCESSORIES

A. General: For trim accessories with back flanges, fasten to framing with the same fasteners used to fasten gypsum board. Otherwise, fasten trim accessories according to accessory manufacturer's directions for type, length, and spacing of fasteners.

F. For level 4 gypsum board finish, embed tape in finishing compound plus two separate coats applied over joints, angles, fastener heads, and trim accessories using one of the following combinations of joint compounds (not including pre-fill), and sand between coats and after last coat.

G. Where level 1 gypsum board finish is indicated, apply joint compound specified for embedding coat.

3.5 CLEANING AND PROTECTION

A. Promptly remove any residual joint compound from adjacent surfaces.

B. Provide final protection and maintain conditions, in a manner suitable to Installer, that ensures gypsum board assemblies remain without damage or deterioration at time of Substantial Completion.

END OF SECTION

SECTION 09660

Resilient Tile Flooring

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Vinyl composition floor tile.

2. Vinyl wall base.

1.3 SUBMITTALS

A. General: Submit the following in accordance with Conditions of Contract and Division1 Specification Sections.

B. Product data from manufacturers for each resilient tile product required.

C. Samples for initial selection purposes in form of manufacturer's standard samples, consisting of strips of actual products showing full range of colors available, for each product.

D. Maintain data from resilient floor tile, to include in Operating and Maintenance Manual specified in Division 1.

1.4 QUALITY ASSURANCE

A. Single Source Responsibility for Materials: Obtain flooring materials from a single manufacturer for each different product required.

B. Fire Performance Characteristics: Provide resilient floor tile with the following fire performance characteristics as determined by testing products per ASTM test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.

1. Critical Radiant Flux: 0.45 watts per sq. cm. Or more per ASTM E 684.

2. Smoke Density: Less than 450 per ASTM E 662.

A. Products: Subject to compliance with requirements, provide the products specified below. Other manufacturers with products similar in quality, composition, color, and pattern will be allowed with prior consent of the Architect.

2.2 RESILIENT TILE

A. Vinyl Composition Floor Tile: Products complying with ASTM F 1066, Composition 1 (nonasbestos formulated), and with requirements specified in Vinyl Composition Floor Tile Product Data Sheet at end of this Section.

1. VCT1: Provide vinyl composition tile product as follows:

a. Composition: 1, asbestos free

b. Gage: 1/8"

c. Acceptable Mfgs: Armstrong.

d. Color/Pattern: Armstrong Imperial in a 3 color pattern.

2.3 ACCESSORIES

A. Vinyl Wall Base: Provide vinyl base complying with FS SS-W-40, Type II, with matching end stops and molded corner units, and as follows:

1. VB 1: Provide vinyl base as follows:

a. Height: 4"

b. Thickness: 1/8" gage

c. Style: Standard top-set cove

d. Finish: Matte

e. Mfg.: Johnsonite, Armstrong, or equal

f. Color: To be selected by Architect

B. Concrete Slab Primer: Nonstaining type as recommended by flooring manufacturer.

C. Trowelable Underlayments and Patching Compounds: Latex-modified, portland-cement based formulation provided or approved by tile manufacturer for application indicated.

D. Adhesives (cements): Water resistant type recommended by tile manufacturer to suit resilient floor tile products and substrate conditions indicated.

3.3 INSTALLATION

A. General: Comply with the manufacturer's installation directions and other requirements indicated that are applicable to each type of tile installation included in the Project.

B. Lay out tiles from center marks establishes with principal walls, discounting minor offsets, so tiles at opposite edges of room are of equal width. Adjust as necessary to avoid using cut widths at perimeter that equal less than one-half of a tile. Install tiles square with room axis, unless otherwise indicated.

C. Match tiles for color and pattern by selecting tiles from cartons in same sequence as manufactured and packaged, if so numbered. Cut tiles neatly around all fixtures. Discard broken, cracked, chipped, or deformed tiles.

D. Scribe, cut, and fit tiles to butt tightly to vertical surfaces, permanent fixtures, built-in furniture including cabinets, pipes, outlets, edgings, thresholds, and nosings.

E. Extend tiles into toe spaces, door reveals, closets, and similar openings.

F. Maintain reference markers, holes, or openings that are in place or plainly marked for future cutting by repeating on finish flooring as marked on subfloor. Use chalk or other non permanent marking device.

G. Adhere tiles to flooring substrates without producing open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, or other surface imperfections in complete tile installation.

H. Use full spread of adhesive applied to substrate in compliance with the manufacturer's directions including those for trowel notching, adhesive mixing, and adhesive open and working times.

I. Hand roll tiles where required by tile manufacturer.

J. Apply wall base to walls, columns, pilasters, casework, and other permanent fixtures in rooms or areas where base is required. Install base in lengths as long as practicable, with performed corner units, or fabricated from materials with mitered or coped inside corners. Tightly bond base to substrate throughout length of each piece, with continuous contact at horizontal and vertical surfaces.

3.4 CLEANING AND PROTECTION

A. Perform the following operations immediately after completing tile installation:

1. Remove visible adhesive and other surface blemishes using cleaner recommended by tile manufacturers.

SECTION 09900

PAINTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Divisionÿ1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes surface preparation, painting, and finishing of exposed interior and exterior items and surfaces.

1. Surface preparation, priming, and finish coats specified in this Section are in addition to shop-priming and surface treatment specified under other Sections.

B. Paint exposed surfaces whether or not colors are designated in schedules, except where a surface or material is specifically indicated not to be painted or is to remain unfinished. Where an item or surface is not specifically mentioned, paint the same as similar adjacent materials or surfaces. If color or finish is not designated, the Architect will select from standard colors or finishes available.

1. Painting includes field-painting exposed bare and covered pipes and ducts (including color coding), hangers, exposed steel and iron work, and primed metal surfaces of mechanical and electrical equipment.

D. Painting is not required on prefinished items, finished metal surfaces, concealed surfaces, operating parts, and labels.

1. Prefinished items not to be painted include the following factory-finished components:

a. Metal siding and roof.

b. Architectural casework.

c. Break metal trim.

d. Overhead doors (not including frames).

e. Finished mechanical and electrical equipment.

6. Labels: Do not paint over Underwriters Laboratories, Factory Mutual or other code-required labels or equipment name, identification, performance rating, or nomenclature plates.

7. Sealers for concrete floors are specified in Division 3 Section, "Cast In Place Concrete."

1.3 SUBMITTALS

A. General: Submit the following according to Conditions of the Contract and Division 1 Specification Sections.

B. Product data for each paint system specified, including block fillers and primers.

1. Provide the manufacturer's technical information including label analysis and instructions for handling, storage, and application of each material proposed for use.

2. List each material and cross-reference the specific coating, finish system, and application. Identify each material by the manufacturer's catalog number and general classification.

C. Samples for initial color selection in the form of manufacturer's color charts.

1.4 QUALITY ASSURANCE

A. Applicator Qualifications: Engage an experienced applicator who has completed painting system applications similar in material and extent to those indicated for the Project that have resulted in a construction record of successful in-service performance.

B. Single-Source Responsibility: Provide primers and undercoat paint produced by the same manufacturer as the finish coats.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to the job site in the manufacturer's original, unopened packages and containers bearing manufacturer's name and label, and the following information:

1. Product name or title of material.

2. Product description (generic classification or binder type).

3. Manufacturer's stock number and date of manufacture.

4. Contents by volume, for pigment and vehicle constituents.

2.2 PAINT MATERIALS, GENERAL

A. Material Compatibility: Provide block fillers, primers, finish coat materials, and related materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by the manufacturer based on testing and field experience.

B. Material Quality: Provide the manufacturer's highest-quality trade retail paint material of the various coating types specified. Paint material containers not displaying manufacturer's product identification will not be acceptable. (Moore Craft is not acceptable)

C. Colors: Provide custom colors of the finished paint systems to match the Architect's samples.

2.3 MASONRY BLOCK FILLER

A. Filler Coat Materials: Provide the manufacturer's recommended factory-formulated, latex-type concrete masonry block fillers that are compatible with the finish materials indicated.

2.4 PRIMERS

A. Primers: Provide the manufacturer's recommended factory-formulated primers that are compatible with the substrate and finish coats indicated.

B. Products: Subject to compliance with requirements, provide one of the following:

1. Gypsum Drywall and Plaster Primer: White, interior, latex based primer.

    a. Moore: Moore's Latex Quick-Dry Prime Seal #201.

2. Ferrous Metal Primers: Alkyd-type primers.

    a. Moore: IronClad Retardo Rust-Inhibitive Paint #163.

3. Galvanized Metal Primer.

    a. Moore's best quality

2.5 UNDERCOAT MATERIALS

A. Undercoat Materials: Provide the manufacturer's recommended factory-formulated undercoat materials that are compatible with the substrate and finish coats indicated.

B. Products: Subject to compliance with requirements, provide one of the following:

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions under which painting will be performed for compliance with paint application requirements. Surfaces receiving paint must be thoroughly dry before paint is applied.

1. Do not begin to apply paint until unsatisfactory conditions have been corrected.

2. Start of painting will be construed as the Applicator's acceptance of surfaces and conditions within a particular area.

B. Coordination of Work: Review other Sections in which primers are provided to ensure compatibility of the total system for various substrates. On request, furnish information on characteristics of finish materials to ensure use of compatible primers.

1. Notify the Architect about anticipated problems using the materials specified over substrates primed by others.

3.2 PREPARATION

A. General: Remove hardware and hardware accessories, plates, machined surfaces, lighting fixtures, and similar items already installed that are not to be painted, or provide surface-applied protection prior to surface preparation and painting. Remove these items, if necessary, to completely paint the items and adjacent surfaces. Following completion of painting operations in each space or area, have items reinstalled by workers skilled in the trades involved.

B. Cleaning: Before applying paint or other surface treatments, clean the substrates of substances that could impair the bond of the various coatings. Remove oil and grease prior to cleaning. Schedule cleaning and painting so dust and other contaminants from the cleaning process will not fall on wet, newly painted surfaces.

C. Surface Preparation: Clean and prepare surfaces to be painted according to the manufacturer's instructions for each particular substrate condition and as specified.

1. Provide barrier coats over incompatible primers or remove and re-prime. Notify Architect in writing about anticipated problems using the specified finish-coat material with substrates primed by others.

2. Wood: Clean surfaces of dirt, oil, and other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Sand surfaces exposed to view smooth and dust off.

between applications where sanding is required to produce a smooth even surface according to the manufacturer's directions.

4. Apply additional coats if undercoats, stains, or other conditions show through final coat of paint until paint film is of uniform finish, color, and appearance. Give special attention to ensure that surfaces, including edges, corners, crevices, welds, and exposed fasteners, receive a dry film thickness equivalent to that of flat surfaces.

5. The term exposed surfaces includes areas visible when permanent or built-in fixtures, convector covers, covers for finned tube radiation, grilles, and similar components are in place. Extend coatings in these areas, as required, to maintain the system integrity and provide desired protection.

6. Paint surfaces behind movable equipment and furniture the same as similar exposed surfaces. Before the final installation of equipment, paint surfaces behind permanently fixed equipment or furniture with prime coat only.

7. Paint interior surfaces of ducts, where visible through registers or grilles, with a flat, non-specula black paint.

8. Paint back sides of access panels and removable or hinged covers to match exposed surfaces.

9. Sand lightly between each succeeding enamel or varnish coat.

10. Omit primer on metal surfaces that have been shop-primed and touch-up painted.

C. Scheduling Painting: Apply first coat to surfaces that have been cleaned, pretreated, or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.

1. Allow sufficient time between successive coats to permit proper drying. Do not re-coat until paint has dried to where it feels firm, does not deform or feel sticky under moderate thumb pressure, and where application of another coat of paint does not cause the undercoat to lift or lose adhesion.

D. Application Procedures: Apply paints and coatings by brush, roller, spray, or other applicators according to the manufacturer's directions.

1. Brushes: Use brushes best suited for the material applied.

2. Rollers: Use rollers of carpet, velvet back, or high-pile sheep's wool as recommended by the manufacturer for the material and texture required.

3. Spray Equipment: Use airless spray equipment with orifice size as recommended by the manufacturer for the material and texture required.

3.4 CLEANING

A. Cleanup: At the end of each work day, remove empty cans, rags, rubbish, and other discarded paint materials from the site.

1. After completing painting, clean glass and paint-spattered surfaces. Remove spattered paint by washing and scraping. Be careful not to scratch or damage adjacent finished surfaces.

3.5 PROTECTION

A. Protect work of other trades, whether being painted or not, against damage by painting. Correct damage by cleaning, repairing or replacing, and repainting, as acceptable to Architect.

B. Provide "Wet Paint" signs to protect newly painted finishes. Remove temporary protective wrappings provided by others to protect their work after completing painting operations.

1. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.6 EXTERIOR PAINT SCHEDULE

A. General: Provide the following paint systems for the various substrates indicated.

B. Colors Schedule: Listed at the end of section.

C. Zinc Coated Ferrous Metal:

1. Surface to be painted include **but are not limited to**:

a. Bollards.

b. Exterior main doors.

c. Door canopy frames.

d. Other Metal finishes not factory painted or otherwise noted.

2. Full gloss Alkyd Enamel: Two finish coats over primer with total dry film thickness not less than 3.5 mils

a. Primer: Galvanized metal primer.

b. First and Second Coats: Gloss alkyd enamel

2. Three (3) Coats on Fully Exposed Surfaces:

   a. First Coat: Satin Finish Polyurethane Filler Coat on Open Grain Wood.

   b. Second and Third Coat: Satin Finish Polyurethane.

2. Sand lightly after first and second coats of polyurethane and after filler coat.

3. Provide minimum two (2) coats on door top, bottom and jambs.

F. Ferrous Metal:

1. Surfaces include **but are not limited to**:

   a. Interior metal doors and frames.

   b. Borrowed lie frames.

   c. Handrails and guardrails.

   d. Bollards.

2. Semigloss Enamel Finish: two (2) coats over primer with total dry film thickness not less than 2.5 mils

   a. Primer: Synthetic Rust Inhibiting Primer.

   b. Undercoat: Interior Enamel Undercoat

   c. Finish Coat: Interior Semigloss Odorless Alkyd Enamel

3.8 COLOR SCHEDULE

A. Color of finish coats shall be as indicated or specified. Where not indicates or specified, colors shall be selected by the Contracting Officer. Manufacturer's names and color identification are used for the purpose of color identification only. Named products are acceptable for use only if they conform to specified requirements. Products of other manufacturers are acceptable if the colors approximate colors indicated and the product conforms to specified requirements.

B. Color Schedule Based on Benjamin Moore's Paint Colors to be selected by Architect:

1. P0: White

2. P1: To match exterior metal siding (gray)

3. P2: To match exterior metal fascia (blue)

SECTION 10522

FIRE EXTINGUISHERS, CABINETS, AND ACCESSORIES

PART 1 - GENERAL

1.1 DISCRIPTION OF WORK

A. This Section includes the following:

1. Fire Extinguishers.

2. Fire Extinguisher Cabinets

B. Related Sections: The following sections contain requirements that relate to this section:

1. Section 15330, "Fire Protection" for fire protection systems

1.2 SUBMITTALS: Submittals required in this section shall be complete and organized in a clear and concise manner. Incomplete and/or unorganized submittals will not be accepted and will be returned without review.

A. Division 1: Conform to the requirements of Division 1, Section 01300, "Submittals.".

B. Product data for cabinets include rough-in dimensions, details showing mounting methods, relationships of box and trim to surrounding construction, door hardware, cabinet type and materials, trim style, door construction, panel style, and materials.

C. Samples for initial selection purposes in the form of manufacturer's color charts consisting of actual units or sections of units showing full range of colors, textures, and patterns available for each type of cabinet finish indicated or exposed to view.

1.4 QUALITY ASSURANCE

A. Single-Source Responsibility: Obtain extinguishers and cabinets from one source from a single manufacturer.

B. UL-Listed Products: Fire extinguishers shall be UL listed with UL listing mark for type, rating, and classification of extinguisher.

C. FM-Listed Products: Fire extinguishers approved by Factory Mutual Research Corporation for type, rating, and classification of extinguisher with FM marking.

G. Door Glazing: Clear float glass complying with ASTM C 1036, Type I, Class 1, Quality q3.

H. Identify fire extinguisher in cabinet with FIRE EXTINGUISHER lettering applied to door. Provide lettering to comply with authorities having jurisdiction for letter style, color, size, spacing, and location.

1. Application Process: Silk screen.

I. Door Style: Manufacturer's standard design.

1. Duo Panel: Float glass, 1/8 inch thick.

J. Door Hardware: Provide manufacturer's standard door-operating hardware of proper type for cabinet type, trim style, and door material and style indicated. Provide either lever handle with cam-action latch, or exposed or concealed door pull and friction latch. Provide concealed or continuous-type hinge permitting door to open 180 deg.

2.7 STEEL CABINET FINISHES

A. Remove or bend tool and die marks and stretch lines into finish.

1. Grind and polish surfaces to produce uniform directional, textured polished finish indicated, free of cross scratches. Run grain with long dimension of each piece.

B. Bright, Directional Polish: AISI No. 4 Finish.

C. Protect finishes on exposed surfaces from damage by application of strippable, temporary protective covering prior to shipment.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install in locations and at mounting heights indicated or, if not indicated, at heights to comply with applicable regulations of governing authorities.

1. Prepare recesses in walls for cabinets as required by type and size of cabinet and style of trim and to comply with manufacturer's instructions.

2. Securely Fasten mounting brackets and cabinets to structure, square and plumb, to comply with manufacturer's instructions.

3. Where exact location of surface mounted cabinets and bracket mounted fire extinguishers is not indicated, locate as directed by the Contracting Officer.

END OF SECTION

SECTION 10800

Toilet and Bath Accessories

PART I - GENERAL

1.1 DISCRIPTION OF WORK

A. This section includes the following toilet accessory items:

1. Grab Bar.
2. Clothes hooks.
3. Toilet tissue dispenser.
4. Paper towel dispensers.
5. Soap dispenser.

B. Mirror units are specified in Section 10830, "Mirror Units".

1.2 SUBMITTALS: Submittals required by this section shall be complete and organized in a clear and concise manner. Incomplete and/or unorganized submittals will not be accepted and will be returned without review.

A. Division 1: Conform to the requirements of Division 1, Section 01300, "Submittals".

B. Product Data for each toilet accessory item specified, including details of construction relative to materials, dimensions, gages, profiles, method of mounting, specified options, and finishes.

C. Schedule: indicating types, quantities, sizes, and installation locations (by room) for each toilet accessory item to be provided for the project.

D. Setting Drawings: Where cutouts are required in other work, provide templates, substrate preparation instructions, and directions for preparing cutouts and for installation of anchorage devices.

1.3 QUALITY ASSURANCE

A. Inserts and Anchorages: Furnish inserts and anchoring devices that must be set in concrete or built into masonry; coordinate delivery with other work to avoid delay.

B. Single-Source Responsibility: Provide products of same manufacturer for each type of accessory unit and for units exposed to view in same areas, unless otherwise acceptable to the Contracting Officer.

4. Heavy Duty Size: Outside diameter of 1-1 ½ inches.

2.3 PAPER TOWEL DISPENSERS

A. Surface-Mount Towel Dispensers: Fabricate of stainless steel with hinged front equipped with tumbler lockset. Provide pierced slots at sides as refill indicators.

1. Capacity: Not less than either 300 C-fold or 400 multifold paper towels without special adapters.

2.4 TOILET TISSUE DISPENSERS

A. Double-Roll Dispenser: Size to accommodate two separate rolls of core type tissue to 5-inch-diameter roll.

1. Fabrication: Spindleless, chrome-plated, zinc alloy construction with tension-spring delivery control: designed for surface mounting.

2.5 SOAP DISPENSERS

A. Liquid Soap Dispenser, Vertical Tank Type: Fabricate for surface mounting, sized for 40-fluid-ounce minimum capacity. Provide stainless steel piston, springs, and internal parts designed to dispense soap in measured quantity by pump action. Provide cover of type 304 stainless steel in No. 4 finish, with unbreakable window-type refill indicator, concealed wall fastening, and locked hinged stainless steel filler top.

1. Equip unit with front mounted push-type valve for dispensing soap in liquid form.

2. Provide vertically oriented unit at a maximum 5" wide.

2.6 MISCELLANEOUS ACCESSORIES

A. Clothes Hooks: Heavy duty satin finished stainless steel double pronged hook, rectangular wall bracket with backplate for concealed mounting.

2.7 FABRICATION

A. General: Only a maximum 1-1 ½ inch diameter, unobtrusive stamped logo of manufacturer, as approved by the Architect, is permitted on exposed face of toilet or bath accessory units. On either interior surface not exposed to view or back surface, provide additional identification by means of either a printed, waterproof label or a stamped nameplate indicating manufacturer's name and product model number.

B. General: No names or labels are permitted on exposed faces of toilet and bath accessory units. On either interior surface not exposed to view or on back surface, provide identification of each accessory item by either a printed, waterproof label or a stamped nameplate indicating manufacturer's name and product model number.

SECTION 10830

Mirror Units

PART I - GENERAL

1.0 DISCRIPTION OF WORK

A. Extent of mirror units is indicated on drawings.

B. Types of mirror units required include the following:

1. Frameless glass mirrors at vanities

C. Toilet accessories are specified elsewhere in Division 10.

1.2 QUALITY ASSURANCE:

A. General: Provide mirror units produced by single manufacturer for entire project.

1.3 SUBMITTALS: Submittals required by this section shall be complete and organized in a clear and concise manner. Incomplete and/or unorganized submittals will not be accepted and will be returned without review.

A. Product Data: Submit manufacturer's technical data, detail drawings, and installation instructions for mirror units.

B. Schedule: Submit schedule indicating mirror types, quantities, sizes and installation locations for each mirror to be provided for project.

C. Specified Project Warranty:

1. Provide manufacturer's written 5 year warranty against silver spoilage of mirrors, agreeing to replace any mirrors which develop visible defects within warranty period.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

A. Mirror Glass: ¼ inch thick, Type I, Class 1, Quality q2, conforming to FS DD-G-451, with silvering, copper coating, and protective organic coating complying with FS DD-M-411.

B. Galvanized Steel Mounting Devices: ASTM A 386, hot dip galvanized after fabrication.

SECTION 12372

PREFABRICATED CASEWORK

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

A. This Section includes plastic laminate office cabinets and plastic laminate countertops.

B. Related Sections: The following sections contain requirements that relate to this section.

1.2 DEFINITION

A. Exposed Portions of casework include all surfaces including edges visible when doors and drawers are closed. Also included are visible surfaces and visible edges of shelves in open casework or behind glass doors and underside of bottoms of casework more than 4 feet above the floor.

B. Semi-Exposed Portions of casework include surfaces behind opaque doors and drawers including shelves, dividers, interior faces of cabinet ends, backs, tops, and bottoms, drawer sides, backs, and bottoms, and back face of doors. Also included are underside of bottoms of casework between 2 feet and 4 feet from floor and flat top 5 feet 9 inches or more above the floor.

C. Concealed Portions of case work include sleepers, web frames, dust panels, and other surfaces not normally visible after installation, including underside of bottoms of casework less than 2 feet above floor.

1.3 SUBMITTALS: Submittals required by this Section shall be complete and organized in a clear and concise manner. Incomplete and/or unorganized submittals will not be accepted and will be returned without review.

A. General: Submit the following according to the Conditions of the Contract and Division 1 Specification Sections.

B. Product data for each casework type specified.

C. Shop drawings for casework showing location and size, accessories, materials, finishes, and filler panels. Include fully dimensioned plans at ½" = 1'-0", elevations, and anchorage details to countertop and walls.

D. Samples for selection purposes for each color, texture, and pattern specified, showing full range of variations expected in these characteristics.

B. Plastic Laminate: Complying with NEMA LD 3, of thickness, type, and grade designation indicated: in colors or patterns and finishes indicated, or, if not indicated, as selected by Architect form manufacturer's standard selection.

2.2 PLASTIC LAMINATE FACE CASEWORK

A. Doors, Drawer Fronts, Fixed Panels, Toeboards, and Ends: Plastic laminate GP 28 on 5/8-inch-thick particleboard.

1. Color (PL1) s selected by Architect from full range of solid colors.

B. Semiexposed Surfacing Material: 0.020-inch thick, high pressure plastic laminate CL20, in color or pattern and finish matching interior of casework, unless otherwise indicated

C. Concealed Materials: Sound, dry solid lumber, plywood, or particleboard without defects affecting strength, utility, or stability.

D. Treatment of Exposed and Semiexposed Edges: Edge doors and drawer fronts with plastic laminate of same material as exposed faces. Edge top of drawer body with high impact plastic tee edging. Edge remaining portions of casework with high pressure plastic laminate not less than 0.028 inch thick matching adjoining plastic laminate in colors or patterns or finish.

E. Style of Face Construction for base, wall, and full height units, if any, with drawer fronts, doors, and fixed panels as follows:

1. Flush overlay, concealing face frames of cabinet body.

F. Construction as follows:

1. Sides, Dividers, Tops, Bottoms, Shelves, and Stretchers: Not less than ½ inch thick. Provide stretchers at top of base cabinet.

2. Backs: Not less than 1/8 inch thick.

3. Drawers: Not less than 3/8 inch thick on sides, subfronts, and backs. Not less than ¼ inch thick for bottoms. Provide box type construction with front, bottom, and back rabbeted in sides and secured with glue and mechanical fasteners.

4. Joinery: Rabbeted backs flush into end panels and secure with concealed mechanical fasteners. Connect wall cabinet tops and bottoms and base cabinet bottoms and stretchers to ends and dividers by means of mechanical fasteners. Rabbet tops, bottoms, and backs into end panels.

5. Subbase: Not less then ¾ inch thick, of height and relationship to cabinet fronts and exposed ends as indicated.

top and bottom of the door. Magnetic catches and residential type roller catches will not be acceptable.

4. Strike Plate shall be injection molded nylon of almond color, with an integral molded engagement ridge. Strike plate shall also provide a wide face bumper insuring a positive door stop. Doors not provided with bumper stop or having strike plate/bumper stop of material other than impact resisting nylon will not be acceptabel. Color of strike plate/bumper catch shall match cabinet interior.

5. Drawers and slide out shelves shall be suspended on nylon roller, epoxy coated steel sides to insure quiet, smooth operation. Slides shall have 100 LB. Load rating with built in drawer stop and self close feature in the last 1" of travel. Slides other than full side mounted roller type or having capacity less than 100 LB will not be acceptable.

6. Locks shall be cylinder type, diecast, with five disc tumbler mechanism. Each lock shall be provided with a milled brass key as follows. All cabinets will be lockable and keyed alike on a per room basis.

2.5 ACCESSORIES

A. General: Manufacturer's standard accessories of type indicated.

2.6 FABRICATION

A. Fabricate casework to dimensions and profiles and details indicated

B. Assemble units in components as large as practicable to minimize field cutting and jointing.

C. Provide filler strips to match cabinets as needed to fill available space. Fillers to be divided equally on both ends of a run cabinets, maximum width 1 ½".

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install casework with no variations in flushness of adjoining surfaces using concealed shims. Where casework abuts other finished work, scribe and cut for accurate fit. Provide filler strips, scribe strips, and moldings in finish to match casework face.

SECTION 12500

WINDOW TREATMENT

PART 1 – GENERAL

1.1 DESCRIPTION OF WORK

A. The extent of window treatment is indicated below. Types of window treatment work in this section :

1. Horizontal blinds for use on exterior windows and interior borrowed lites.

2. Provide horizontal blinds at all exterior windows and interior borrowed lites.

1.2 QUALITY ASSURANCE

A. General: Provide window treatment units which are complete assemblies produced by one manufacturer, including hardware, accessory items, mounting brackets, and fastenings.

B. Furnish materials in colors and patterns as selected by Contracting Officer from manufacturer's standard colors / patterns.

1.3 SUBMITTALS

Submittals required by this section shall be complete and organized in a clear and concise manner. Incomplete and/or unorganized submittals will not be accepted and will be returned without review.

A. Division 1: Conform to the requirements of Division 1, Section 01300, "Submittal."

B. Product Data: Submit manufacturer's specifications and installation instructions for each type of window treatment unit required. Include methods of installation for each type of opening and supporting structure.

C. Samples for initial selection of color, in form of manufacturers' color charts consisting of sections of exposed components with integral or applied finishes showing full range of colors and materials.

1.4 EXTRA MATERIALS

A. Maintenance Stock: Furnish extra materials matching products installed, packaged with protective covering for storage and identified with labels clearly describing contents.

1. Typical Window Treatment Units: Furnish one (1) typical exterior window treatment unit.

1. Aluminum Slats: Provide manufacturer's standard factory-applied finish system consisting of chemical conversion coating followed by baked-on synthetic resin enamel finish coat.

2. Color shall be selected by Architect from Manufacturer's standard selections.

2.2 FABRICATION AND OPERATION

A. Prior to Fabrication: Verify actual opening dimensions by accurate site measurements. Adjust dimensions for proper fit at openings. Cooperate with other trades for securing brackets to substrates and other finished surfaces. Fabricate window treatment components from non-corrosive, non-staining, non-fading materials which are completely compatible with each other, and which do not require lubrication during normal expected life.
B. Fabricate blind units to completely cover glazing stops by 1" on top, bottom, and sides.
C. Space supporting ladders to comply with manufacturer's standards, unless otherwise indicated.
D. Space slats to provide overlap for light exclusion when in fully closed position.
E. Equip horizontal blind units, unless otherwise indicated for the following operation:

1. Full-tilting operation with slats rotating approximately 180 degrees. Place tilt operating controls on hinged side of doors, unless otherwise indicated.
2. Provide restraints to hold wand and control cords parallel to face of blind units when not in use.
3. Provide Manufacturers' standard hardware to secure bottom rail to doors.

PART 3 – EXECUTION

3.1 INSTALLATION:

A. General: Install window treatment units in manner indicated to comply with manufacturer's instructions. Position units level, plumb, secure, at proper height and location relative to adjoining glazing and other related work. Securely anchor units with proper clips, brackets, anchorages, suited to type of mounting indicated.
B. Provide adequate clearance between door hardware and blinds to permit unencumbered operation of door hardware.
C. Protect installed units to ensure their being in operating condition, without damage, blemishes, or indication of use at completion of project. Repair or replace damaged units as directed by the Contracting Officer.

END OF SECTION 07410

SECTION 13126

PRE-ENGINEERED WOOD BUILDING SYSTEM

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes: Primary and secondary structural framing systems, roofing and exterior wall covering systems, personnel exterior doors, exterior windows, and accessories.

B. Products Supplied But Not Installed Under This Section: Anchor bolts.

C. Related Sections:

1 Section 03310–Cast-in-Place Concrete: Foundations and floor slab.

2 Section 08710–Hardware: Door hardware and keying systems.

D. Maintain the drawings as shown. This includes the following:

1. Maintain headroom of 8'-0" in the offices and 6'-0" in the Mezzanine.
2. A Two step fascia.
3. 3 1/2" wide trims at windows and doors.

1.2 DEFINITIONS

A. Drawings: Contract documents prepared by the Architect.

B. Erection Drawings: Detailed project drawings prepared by the building manufacturer.

C. Primary Framing: Pre-fabricated wood columns and pre-fabricated wood trusses including corner and endwall columns and trusses with required fasteners.

D. Secondary Framing: Wood purlins, girts, sill plate, and bracing.

1.3 SYSTEM DESCRIPTION

A. Design Requirements

1. Building Code: BOCA, National Building Code current Edition.

2. Design Loads:

a. Roof Load: Snow load: 60 psf.
Live load: provided by manufacture.

b. Dead Loads: Truss top chord: provided by manufacture.

2) Manufacturer qualification.
3) Dealer qualification.
4) Installer qualification.

1.5 QUALITY ASSURANCE

A. Qualifications:

1. Manufacturer Qualifications: Minimum five years experience in producing pre-engineered wood buildings of the type specified.

2. Dealer Qualifications: Must be manufacturer authorized dealer; state date authorization granted and expiration if any.

3. Installer Qualifications: Minimum one year experience in erection of pre-engineered wood buildings of the type specified.

B. Structural Engineer Certification: Letter signed by a Professional/Structural Engineer, registered to practice in the state of Maine verifying compliance with specified Design Requirements. Letter must reference specific dead loads, live loads, wind loads, tributary area load reductions (if applicable) collateral loads, seismic loads, end use categories, and governing building code including edition and load applications.

C. Trusses:

1. Comply with TPI "Design Specification for Metal Plate Connected Wood Trusses" and "Quality Standard for Metal Plate Connected Wood Trusses."

2. Manufacturer shall have a third party inspection program to verify compliance

3. Stamp trusses with inspection agency identification.

1.6 DELIVERY STORAGE AND HANDLING

A. Deliver panels and other components so they will not be damaged or deformed. Package wall and roof panels for protection against transportation damage.

B. Handling: Exercise care in unloading, storing, and erecting wall and roof covering panels to prevent bending, warping, twisting, and surface damage.

C. Stack materials on platforms or pallets, covered with tarpaulins or other suitable weathertight ventilated covering. Store metal wall and roof panels so that they will not accumulate water. Do not store panels in contact with other materials that might cause staining, denting, or other surface damage.

1.7 WARRANTY

A. Finish Warranty: Furnish panel manufacturer's written warranty covering failure of factory-applied exterior finish on metal wall and roof panels within the warranty

b. Configuration: 2x4 or 2x6 as required by "Structural Design" requirements specified herein.

1) Girts: Precision cut to fit.
2) Purlins: Precision cut to fit between trusses flush with top of top chord. Provide 20 gauge galvanized purlin saddle hangers.

c. Spacing: As required by "Structural Design" requirements specified herein.

2. Sill Plate:

a. Lumber: No. 2 or Better Southern Yellow Pine, pressure treated with Chromated Copper Arsenate, Type III, to a retention of 0.4 pcf and kiln dried after treating to 19 percent maximum moisture content.
b. Configuration: 2x6, 2x8, or 2x10 dimension lumber as required by "Structural Design" requirements specified herein.

3. Bracing, Wall and Lateral Truss Type (where required by "Structural Design"):

a. Lumber: No. 2 or Better dimension lumber.
b. Configuration: 2x4 or 2x6 as required by "Structural Design" requirements specified herein.

2.3 ROOFING AND SIDING

A. Face Sheets: Fabricate wall and roof panel face sheets to the profile or configuration indicated from 26-gage (0.0239-inch) zinc-coated or aluminum-zinc-coated steel sheets.

1. Wall and roof panel configuration: Nominal 2.5" x 1" corrugated sheets in 36" widths.

B. Lap-Seam Roof Panels: Manufacturer's standard factory-formed lap-seam roof panel system designed for mechanical attachment of panels to roof substrate using exposed fasteners and sealants. Form panels of 26-gage (0.0239-inch) zinc-coated or aluminum-zinc-coated steel sheets.

2.4 PERSONNEL DOORS

A. Refer to section 08111 for all doors. All exterior man doors provided by the building manufacturer.

2.5 WINDOWS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering window units that may be incorporated in the Work include, but are not limited to, the following:

1. Aluminum-Clad Wood Window Units:

a. Weatherstripping Material: Molded, expanded, EPDM or neoprene gaskets complying with ASTM C 509, Grade 4.

6. Glass-Fiber-Mesh Insect Screen: 18-by-14 (1.4-by-1.8-mm) or 18-by-16 (1.4-by-1.6-mm) mesh of plastic-coated glass-fiber threads, woven and fused to form a fabric mesh resistant to corrosion, shrinkage, stretch, impact damage, and weather deterioration. Comply with requirements of ASTM D 3656.

7. Glass and Glazing Materials: Provide manufacturer's standard clear, sealed, insulating glazing material that complies with Division 8 Section "Glazing."

8. Glazing Seal: Provide manufacturer's standard extruded, vinyl, or butyl glazing gasket providing weathertight seal.

C. Hardware, General: Provide manufacturer's standard hardware, necessary to operate, tightly close, and securely lock windows. Do not use aluminum in frictional contact with other metals.

1. Provide solid bronze hardware with plated steel or brass/bronze operating bars and rods.

D. Counterbalancing Mechanism: Comply with AAMA 902.2.

1. Sash-Balance Type: Concealed tape-spring type of size and capacity to hold sash stationary at any open position.

F. Accessories, Insect Screens: Provide insect screens for each operable exterior sash or ventilator. Locate screens on inside or outside of window sash or ventilator, depending upon window type. Design windows and hardware to accommodate screens in a tight-fitting, removable arrangement, with a minimum of exposed fasteners and latches.

1. Screen Frames: Fabricate frames of tubular-shaped, extruded- or formed-aluminum members of 0.040-inch- (1-mm-) minimum wall thickness, with mitered or coped joints and concealed mechanical fasteners. Provide removable PVC spline/anchor concealing edge of screen frame. Comply with requirements of SMA 1004.

a. Finish: White Anodized aluminum or baked-on organic coating.

F. Double-hung Windows, Window Grade: Comply with requirements of NWWDA Performance Grade DP15.

1. Provide window units with tilt-in feature permitting both sides of the sash to be cleaned from interior.

G. Hardware: Provide the following equipment and operating hardware:

1. Sash Balances: Manufacturer's standard, concealed, counterbalancing-mechanism-type sash balances (2 per sash).

nonmigrating sealant.

D. Elastomeric Sealant: Generic type recommended by manufacturer of metal and fabricator of components being sealed and complying with requirements for joint sealants as specified in Division 7 Section "Joint Sealers."

E. Polyethylene Underlayment: Minimum 6-mil carbonated polyethylene film resistant to decay when tested in accordance with ASTM E 154.

F. Metal Accessories: Provide sheet metal clips, straps, anchoring devices, and similar accessory units as required for installation of work, matching or compatible with material being installed, noncorrosive, size and gage required for performance.

G. Roofing Cement: ASTM D 2822, asphaltic.

H. General Metal Fabrication: Shop-fabricate work to greatest extent possible. Comply with details shown and with applicable requirements of SMACNA "Architectural Sheet Metal Manual" and other recognized industry practices. Fabricate for waterproof and weather-resistant performance, with expansion provisions for running work, sufficient to permanently prevent leakage, damage, or deterioration of the work. Form work to fit substrates. Comply with material manufacturer instructions and recommendations for forming material. Form exposed sheet metal work without excessive oil-canning, buckling, and tool marks, true to line and levels indicated, with exposed edges folded back to form hems.

I. Sealant Joints: Where movable, nonexpansion type joints are indicated or required for proper performance of work, form metal to provide for proper installation of elastomeric sealant, in compliance with SMACNA standards.

1. Separations: Provide for separation of metal from noncompatible metal or corrosive substrates by coating concealed surfaces at locations of contact, with bituminous coating or other permanent separation as recommended by manufacturer/fabricator.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that site conditions are acceptable for erection/installation of pre-engineered wood building system.

B. Coordinate with responsible entity to perform corrective work on unsatisfactory conditions.

C. Commencement of work by erector/installer is acceptance of site conditions.

3.2 ERECTION–STRUCTURAL FRAMING

3.4 CLEANING

A. Clean surfaces soiled by work as recommended by manufacturer.

B. Touch up abrasions and other defects on pre-painted metal panel surfaces with same type of primer and paint as original finish.

C. Remove surplus material and debris from site.

END OF SECTION

SECTION 15050 - BASIC MECHANICAL MATERIALS AND METHODS

PART 1: GENERAL

1.01 WORK INCLUDED

A. Basic Mechanical Materials and Methods for Division 15 includes, but is not limited to, the following:

1. Mechanical Insulation - Section 15250
    a. Hot Water Piping - Heating
    b. Hot and Cold Water Piping - Domestic
2. Plumbing - Section 15400
    a. Building Sanitary Piping
    b. Building Storm Piping
    c. Domestic Hot and Cold Water Piping
    d. Drains - Roof and Floor
    e. Cold Water Process Piping
3. Plumbing Fixtures - Section 15440
    a. Fixtures (Water Closets, Lavatory, Security Fixtures, etc.,)
    b. Fixtures Trim (Stops, Escutcheon, etc.,)
    c. Water Coolers, Equipment Access, etc.
4. Plumbing Equipment - Section 15450
    a. Water Heaters (Domestic Hot Water Generators - Steam to Water)
    b. Hot Water Circulating Pump
    c. Sump Pumps
5. Special Systems - Section 15480
    a. Natural Gas Piping System
6. Heating, Ventilating and Air Conditioning - Section 15500
    a. Hot Water Heating and Piping - Heating

2. Fire and Smoke Barriers require sealing around penetrations with fire rated material in accordance with NFPA-101: Two hour partitions, one hour partitions, smoke partitions, and floors. Chase enclosures and partitions above ceilings are included. (Pipe and duct insulation through these penetrations must be a high temperature rated material such as rock wool.)

3. Option or Optional: Contractor's choice of an alternate material or method.

1.02 RELATED WORK

A. Section 02220 - Excavating, Backfilling and Compacting

B. Section 03001 - Concrete

C. Section 05500 - Metal Fabrications

D. Section 07600 - Flashing and Sheet Metal

E. Section 07900 - Sealants

F. Section 09900 - Painting

1.03 QUALITY ASSURANCE

A. Objectionable Noise and Vibrations:

1. Mechanical and electrical equipment shall operate without objectionable noise or vibration, as determined by the Engineer.

2. If such objectionable noise and vibration should be produced and transmitted to occupied portions of building by apparatus, piping, ducts, or any other part of mechanical and electrical work, make necessary changes and additions, as approved, without extra cost to Owner.

B. Products Criteria:

1. Standard Products: Material and equipment shall be the standard products of a manufacturer regularly engaged in the manufacture of the products. Items of equipment shall essentially duplicate equipment that has been in satisfactory use at least two years prior to bid opening. Provide list of users upon request.

2. Equipment Service: Products shall be supported by a service organization which maintains an adequate inventory of repair parts and is located, in the opinion of the Architect/Engineer, reasonably close to the site.

3. Multiple Units: When two or more units of materials or equipment of the same type or class are required, these units shall be products of one manufacturer.

4. Assembled Units: Manufacturer's of equipment assemblies, which use components made by others, assume complete responsibility for the final assembled product.

c. Equipment and materials identification.

d. Firestopping Materials

e. Wall floor and ceiling plates.

3. Maintenance Data and Operating Instructions:

a. Maintenance and operating manuals for systems and equipment.

b. Provide a listing of recommended replacement parts for keeping in stock supply, including sources of supply, for equipment.

4. Substitutions:

a. The bid shall be based on the materials or products as specified. Whenever in the specifications a particular article is specified by proprietary name, names, or "approved equal", the bidder shall base his bid on one of the above. The first name listed in the specifications is the name design was based on and scheduled.

b. Any materials or products not herein specified, but worthy of consideration shall be so noted in a separate letter attached to his Proposal Form stating supplier, manufacturer or name and the amount to be added to or deducted from base bid and his reasons for the suggested substitution. He shall also assume the costs necessary for revision in the project due to this substitution.

1.05 PROJECT CONDITIONS

A. Regulatory Requirements:

1. Obtain and pay for all required permits, inspections, licenses, etc.

2. Execute all work to conform to the requirements of all Local, State and Federal laws, regulations, etc., applicable to the work.

B. Drawings:

1. The general location of the apparatus and the details of the work are shown on the drawings, which form a part of this specification. Exact locations are to be determined at the building as the work progresses, and shall be subject to the Architect/Engineer's approval.

2. Anything shown on the drawings and not mentioned in the specifications or vice versa, shall be furnished as if it were both shown and specified.

3. It is not intended that the drawings shall show every pipe, fitting or appliance, but it shall be a requirement to furnish without additional expense, all material and labor necessary to complete the systems in accordance with the best practice of the trade.

2.02 DRIVE GUARDS

A. For machinery and equipment, provide guards as shown in AMCA 410 for belts, chains, couplings, pulleys, sheaves, shafts, gears and other moving parts regardless of height above the floor. Drive guards may be excluded where motors and drives are inside factory fabricated air handling unit casings.

B. Materials: Sheet steel, cast iron, expanded metal or wire mesh rigidly secured so as to be removable without disassembling pipe, duct or electrical connections to equipment.

C. Access for Speed Measurement: One-inch diameter hole at each shaft center.

2.03 ELECTRIC MOTORS

A. Provide special energy efficient motors as scheduled below. Unless otherwise specified for a particular application, use electric motors with the following requirements.

1. All motors furnished shall meet NEMA requirements and shall have an operating temperature of not to exceed 40 degrees C above ambient temperature and be so marked.

2. All motors shall be of the open drip-proof type, except as noted.Motors may be furnished of fully enclosed type if it is the standard equipment.

3. Energy efficient motors shall be high efficiency design, NEMA design B with NEMA nominal efficiency of the following:

MINIMUM GUARANTEED ELECTRIC MOTOR EFFICIENCIES

HORSEPOWER RATING	PERCENTAGE EFF.- 3600 RPM
1	78
5	86.3
7.5	87.7
10	89.0

4. Starters: Except where specified otherwise, and where furnished with packaged units, manual or magnetic starters shall be provided under Division 16 - Electrical. It shall be the responsibility of this division for proper overload elements sized for protection of the motor in accordance with manufacturer's recommendations. Provide overload protection for each phase conductor. Provide disconnects for each piece of equipment.

2.04 EQUIPMENT AND MATERIALS IDENTIFICATION

A. Use symbols, nomenclature and equipment numbers specified, shown on the drawings and in the maintenance manuals.

B. Interior (Indoor) Equipment: Engraved nameplates, with letters not less than 3/16" high of brass with black-filled letters, or rigid black plastic with white letters permanently fastened to the equipment equal to Seton Style No. 2060 series.

C. Tool Containers: Hardwood or metal, permanently identified for intended service and mounted, or located, where directed.

D. Lubricants: A minimum of one quart of oil, and one pound of grease, of equipment manufacturer's recommended grade and type, in unopened containers and properly identified as to use for each different application.

2.08 ASBESTOS

A. Any equipment or material which has asbestos as a component will not be allowed on this job.

B. In accordance with Division 1 - General Requirements, Contractor shall provide certification that all materials and equipment used for construction under this contract are 100% asbestos free.

PART 3: EXECUTION

3.01 INSTALLATION

A. Coordinate location of piping, sleeves, inserts, hangers, ductwork and equipment. Locate piping, sleeves, inserts, hangers, ductwork and equipment clear of windows, doors, openings, light outlets, and other services and utilities. Follow manufacturer's published recommendations for installation methods not otherwise specified. All work to abide by all codes and intent of drawings and specifications with the best practices of the trade. See Section 01000 - General Conditions.

B. Protection and Cleaning:

1. Equipment and materials shall be carefully handled, properly stored, and adequately protected to prevent damage before and during installation, in accordance with the manufacturer's recommendations. Damaged or defective items shall be replaced.

2. Protect all finished parts of equipment, such as shafts and bearings where accessible, from rust prior to operation by means of protective grease coating and wrapping. Close pipe openings with caps or plugs during installation. Tightly cover and protect fixtures and equipment against dirt, water chemical, or mechanical injury. At completion of all work, thoroughly clean fixtures, exposed materials and equipment.

3. After satisfactory completion of pressure tests, before permanently connecting equipment, strainers, and the like, clean equipment thoroughly, blow and flush piping for a sufficient length of time as directed, so that interiors will be free of foreign matter.

4. Fill, vent and circulate the system with approved solution in accordance with equipment manufacturer's recommendations, allowing it to reach design or operating temperatures. After circulating a few hours, the system should be drained completely.

5. The entire ventilating system installations including apparatus, motors, inside of ducts, etc., shall be left in first-class condition including cleaning, oil and packing.

two (2) delivered to the Owner and the third to the Engineer for record purposes.

3.06 RECORD DRAWINGS

A. The Contractor shall keep on the job, a set of blue-line prints neatly marked in red ink showing any changes to the installation. These shall be given to the Architect/Engineer at the completion of the work.

END OF SECTION

SECTION 15250 - MECHANICAL INSULATION

PART 1: GENERAL

1.01 WORK INCLUDED

A. Furnish all labor, materials, equipment, supplies, and perform all operations necessary to complete the following insulation work, in accordance with the drawings and these specifications which includes but is not limited to:

1. Hot Water Piping - Heating

2. Hot and Cold Water Piping - Domestic

1.02 RELATED WORK

A. Section 15050 - Basic Mechanical Materials and Methods

B. Section 15400 - Plumbing

C. Section 15500 - Heating, Ventilating and Air Conditioning

D. Section 15550 - Heat Generation

E. Section 15750 - Heat Transfer

F. Section 15880 - Air Distribution

1.03 SYSTEM DESCRIPTION

A. Definitions:

1. Air Conditioned Space: Space directly supplied with heated or cooled air.

2 .Cold: Equipment, ductwork or piping handling media at design temperature of 60 degrees F or below.

3. Chilled Water: Piping at design temperature of 45 degrees F or below.

4. Exposed: Piping, ductwork and equipment exposed to view in finished areas including mechanical equipment room.

5. Hot: Ductwork handling air at design temperature above 60 degrees F; equipment or piping handling media to 100 degrees F or above.

6. Pcf: Density, pounds per cubic foot.

7. Runout: Branch pipe connection up to one inch nominal size to a terminal unit such as a fan-coil unit.

8. Thermal Conductance: Heat flow rate through materials.

1.05 SUBMITTALS

A. In accordance with Section 15050 - Basic Mechanical Materials and Methods, furnish the following:

1. Manufacturer's Literature and Data:

a. Insulation Materials: Each type used.

b. Insulation Facings and Jackets: Each type used. Make it clear that white finish will be furnished for exposed equipment.

c. Insulation Accessory Materials: Each type used.

d. Manufacturer's installation and fittings fabrication instructions for flexible unicellular insulation.

e. Make reference: To applicable specification paragraph numbers for coordination.

1.06 REFERENCES

A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by basic designation only.

1. American Society for Testing and Materials (ASTM) (Latest Edition):

C 449-77	Specification for Mineral Fiber Hydraulic-Setting Thermal Insulating and Finishing Cement
C 585-76	Inner and Outer Diameters of Rigid Thermal Insulation for Nominal Sizes of Pipe and Tubing (NPS System)
D781-68	Puncture and Stiffness of Paperboard, Corrugated and Solid Fiberboard, Test
E84-79b	Surface Burning Characteristics of Building Materials Test
E119-78	Fire Tests of Building Construction and Materials
E136-73	Noncombustibility of Elementary Materials, Test

2. National Fire Protection Association (NFPA) (Latest Edition):

NFPA 255	Surface Burning Characteristics of Building Materials - 1976
NFPA 90A	Air Conditioning and Ventilating Systems - 1978

3. Underwriters Laboratories, Inc. (UL):

UL 723	Tests for Surface Burning Characteristics of Building Materials

D. Materials shall be as manufactured by Owens-Corning, Gustin-Bacon, CertainTeed, Johns-Manville or approved equal.

2.03 FLEXIBLE UNICELLULAR INSULATION FOR REFRIGERANT AND DOMESTIC CHILLED WATER (BRANCH RUNOUTS ONLY IN MASONRY WALLS FOR DOMESTIC HOT AND COLD WATER AND HEATING HOT WATER PIPING

A. Piping system shall have k = 0.30. No jacket required. Drain pan condensate piping may also be insulated with unicellular insulation.

1. Material with a flame spread rating of 25 or less may be used in lieu of fiberglass insulation.

2. Entire system piping shall be completely insulated with 1/2" thick insulation.

B. Heat Recovery and Domestic Hot and Cold Water Storage Tanks: Insulate complete unit with two layers of 1/2" thick Armaflex elastmeric thermal insulation.

C. Material shall be as manufactured by Armstrong or approved equal.

2.04 CELLULAR GLASS AND MINERAL FIBER INSULATION FOR PIPE

A. Density 8.5 pcf nominal, k = 0.38 For Cellular glass and density 8 pcf nominal, K = 0.30 for mineral fiber: With thickness increased to provide equal thermal efficiency, cellular glass or mineral fiber may be used in lieu of fiberglass insulation.

B. Material shall be as manufactured by Pittsburgh Corning, Yankee or approved equal.

2.05 INSULATION ACCESSORY MATERIALS

A. Insulation Inserts at Supports on Outside of Insulation:

1. Material: Hydrous calcium silicate, equal to Manville Thermo-12, of same thickness as adjacent insulation.

2. Provide for all Piping: Install with metal insulation shields furnished with pipe supports. Minimum insert length: 10" for up to 3" pipe; 12" for 3" to 6" pipe; and 16" for 8" to 10" pipe.

B. Mechanical Fasteners:

1. Pins, Anchors: Welded pins, or metal or nylon anchors with tin-coated or fiber washer, or clips. Pin diameter shall be as recommended by the insulation manufacturer.

2. Staples: Outward clinching monel or stainless steel.

3. Wire: 18 gauge soft annealed galvanized, or 14 gauge copper clad steel or nickel copper alloy.

4. Bands: 3/4" nominal width, brass, galvanized steel, aluminum or stainless steel.

3. All piping with fluid temperatures between 60 degrees F and 100 degrees F shall not be insulated. (All loop water plant piping.)

4. Steam traps, dirt pockets, nipples and caps, flash tanks and condensate receivers.

5. Vent to atmosphere, discharge from safety and relief valves.

F. Apply insulation materials subject to the manufacturer's recommended temperature limits. Apply adhesives, mastics and coatings at the manufacturer's recommended minimum coverage.

3.02 INSULATION INSTALLATION

A. Fiberglass Board-Plain Board: Chilled Water Pumps - Insulate with removable and replaceable 20 gauge aluminum or galvanized steel covers lined with 1" insulation. Seal closure joints/flanges of covers with gasket material.

B. Molded Fiberglass Pipe and Tubing Covering:

1. Fit insulation to pipe aligning longitudinal joints. Seal longitudinal joint laps and circumferential butt strips by rubbing hard with a nylon sealing tool to assure a positive seal. Staples may be used to assist in securing insulation. Staples shall not penetrate more than one half the insulation thickness. Seal all vapor barrier penetrations with vapor barrier mastic. Provide inserts and install with metal insulation shields at outside pipe supports.

2. Contractor's options for fitting, flange and valve insulation:

a. Insulating and finishing cement for fitting sizes less than 4" operating at surface temperature of 100 degrees F or more.

b. Factory premolded, one piece PVC covers with mineral fiber inserts. Provide two insert layers for pipe temperature below 40 degrees F or above 250 degrees F. Secure first layer of insulation with twine. Seal seam edges with vapor barrier mastic and secure with fitting tape.

c. Factory molded or field mitered sections, joined with adhesive or wired in place. For cold fittings, 60 degrees F or less, vapor seal with a layer of glass fitting tape imbedded between two 1/16" coats of vapor barrier mastic.

d. Fitting tape shall extend over the adjacent pipe insulation and overlap on itself at least two inches.

C. Pipe insulation at penetrations of floors and of fire partitions of walls, including chase walls, fire rated two hours or more:

1. Wrap pipe with rock wool pipe insulation, seal jacket seam and seal end joints to adjacent sections of insulation.

2. Seal opening between insulation and sleeve with firestop material.

SECTION 15400 - PLUMBING

PART 1: GENERAL

1.01 WORK INCLUDED

A. Furnish all labor, materials, equipment and transportation required to completely install the plumbing and water systems, with all connections as shown on the drawings and described in these specifications or as required by the State of Maine Plumbing Code. The accompanying drawings do not show every detail of pipes, valves, fittings, hangers, equipment and fixtures which are necessary for the complete installation, but are provided to show the general arrangement and extent of work to be performed. The plumbing system required for this work includes, but is not necessarily limited to:

1) Building sanitary discharge piping to 8'- 0" outside building foundation as shown on drawings.

2) Building supply water piping for domestic water service to 8'-0" outside building or as indicated.

3) Hot water and cold water piping within building.

4) All soil, waste and plumbing vent lines.

5) Floor Drains.

6) Section 15440 - Plumbing Fixtures.

7) Section 15450 - Plumbing Equipment.

8) Section 15480 - Special Systems (Natural Gas).

9) Testing.

10) All other plumbing items indicated on the drawings, specified herein, or needed for a complete and proper plumbing installation.

1.02 RELATED WORK

A. Division 2 - relative to Water Distribution & Sanitary Sewer.

B. Section 15250 - Mechanical Insulation

C. Division 16 - Electrical

1.03 QUALITY ASSURANCE

A. Qualification of Workmen: Use sufficient licensed journeymen and competent licensed supervisors in the execution of this portion of the work to ensure proper and adequate installation of plumbing throughout.

B. Codes: Work performed by this contractor shall conform to State of Maine Plumbing Code latest edition and revisions. This code is considered a part of these specifications.

b. Neatly typewritten index near the front of the manual, furnishing immediate information as to location in the manual of all emergency data regarding the installation.

c. Complete instructions regarding operation and maintenance of all equipment involved.

d. Complete nomenclature of all replaceable parts, their part numbers, current cost, and name and address of nearest vendor of parts.

e. Copy of all guarantees and warranties issued.

f. Copy of as-built drawings.

g. Where contents of manuals include manufacturer's catalog pages, clearly indicate the precise items included in this installation and delete, or otherwise clearly indicate, all manufacturer's data with which this installation is not concerned.

E. Drawings:

1) Plumbing drawings are diagrammatic and do not show every detail of piping. Contractor shall install work in general as shown on drawings but fixtures and piping may be relocated if necessary to avoid conflict with other trades provided that such relocation be made with consent of the Architect/Engineer and without additional cost to the Owner.

2) Piping shall be installed in pipe spaces, pipe chases, etc., as provided by General Contractor. Check architectural drawings for finish schedule and explicit details.

3) All fixtures shall be piped with waste, hot and/or cold water and vent as required, whether or not such piping is shown on the drawings.

F. Temporary Facilities:

1) The General Contractor is to provide his own source of water, including storage, during entire construction period, in the best manner he sees fit.

2) The General Contractor shall provide ample toilet facilities with proper enclosures for use of workmen employed on the work. These facilities shall be used during construction period. The toilets within the buildings shall not be used by the workmen.

G. Cross Connections: No piping shall be installed in such a manner to permit back-siphonage or flow of any liquid into water service piping under any conditions. Air gaps, funnel type drains and approved vacuum breakers shall be provided as required by the Maine State Plumbing Code the local water purveyor and any requirements of the Town of Poland. Piping to hose end faucets shall have vacuum breakers.

H. Cutting and Patching:

1) The Plumbing Contractor shall be responsible for informing various trades of sizes and locations of all chases, holes and supports, etc., which his work may require within the building structure. He will be responsible for construction and location of above mentioned items, including exact location (horizontal and vertical) of all sleeves.

2.02 PIPE

A. Soil, Waste and Vent Piping and Accessories:

1) Underground pipe and fittings shall be service weight, coated cast iron bell and spigot with either lead and oakum or neoprene compression gaskets.

2) Above ground waste pipe and fittings may be service weight, coated cast iron as in "1." above or hubless cast iron with joints of neoprene gasket and stainless steel clamp; or type "L" copper with joints of 50/50 solder. Fittings to be cast or wrought D.W.V. As an option, Schedule 40 PVC with solvent fused joint, standard socket type fittings may be used for all above ground sanitary piping.

3) Vent piping not buried shall be Schedule 40 rigid PVC plastic pipe and fittings made up with solvent cement meeting ASTM D-2665 or as an option may be schedule 40 galvanized steel pipe.

4) Buried vent piping shall be as specified for soil and waste above.

5) Hubless cast iron pipe fittings shall conform to FS WW-P-401; hub and spigot cast iron pipe shall conform to ASTM A74.

6) At floor penetrations, fitting or piping hubs to show above floor.

B. Domestic Water Piping:

1) All hot and cold water piping above finish floor (not buried) shall be hard-drawn type "L" copper tube with cast or wrought fittings and made up with non-lead bearing solder such as "Silver Brite" or equivalent.

2) All buried cold water piping shall be type "K" soft copper tubing and installed with silver solder joints below floor slab.

3) Service water entrance for domestic to be same material as specified under section 02660 - Water Distribution Systems.

2.03 VALVES

A. General:

1) Valves shall be provided as shown and as required to make the installation and its apparatus complete in operation; locate to permit easy operation, replacement and repair to the domestic water systems..

2) All valves must be so constructed that they may be repacked under pressure while open.

3) Globe, ball or butterfly valves shall be installed in all lines where regulation is required.

4) Check valves shall be installed in all lines where flow may reverse from intended direction.

B. Quality: All valves shall be of one manufacturer and as manufactured by Nibco, Conbraco, Crane, Fairbanks, Jenkins, Milwaukee, or approved equal. The following list is based on Nibco as a means of identifying the

to use, one component acrylic sealant which expands when exposed to heat to provide protection in penetrations for up to 2 hours. Install in strict accordance with manufacturer's instructions and with UL Fire Resistance Directory.

B. Escutcheons: Where piping passes through finish walls, floors, ceilings and partitions, provide and set two piece nickel plated steel floor and ceiling plates. Smooth rough edges around sleeves with plaster or spackling compound.

2.05 HANGERS AND SUPPORTS

A. General:

1) All hangers and supports shall be specially manufactured for that purpose and shall be the pattern, design and capacity required for the location of use.

2) Piping specified herein shall not be supported from piping of other trades.

3) Hangers shall be heavy duty steel adjustable clevis type; plain for steel, cast iron and plastic pipe and copper plated for copper tubing equal to F and S Manufacturing Corp. Fig. 86 (Fig. 86CT copper plated). For special hangers, refer to drawings for details.

4) Exposed vertical risers 3/4" and smaller shall be supported at the mid-point between floor and ceiling with split ring type hangers; copper plated for copper tubing equal to F and S Manufacturing Corp. Fig. 4 (Fig. 4 CT copper plated).

5) Piping suspended from walls and partitions shall be supported by steel support bracket with adjustable clips equal to F and S Manufacturing Corp. Fig. 820 and 820C.

B. Hanger Rods and Attachments:

1) Hanger rods shall be all thread rod in concealed areas, and rods threaded on ends of rod only in finished areas and the Boiler Room. Rod size shall be 3/8" for piping 2" and under; ½" for 2-1/2" to 6"; 5/8" over 6".

2) Provide lag points with rod couplings for fastening to wood, toggle bolts in concrete blocks and compound anchor shields and bolts in poured concrete.

3) Provide and install angle iron supports for pipe hangers in locations as required. Angle iron supports shall be adequate size for span and piping or equipment.

4) Hot and cold water piping at each fixture shall be securely fastened to drain in wall with ABS plastic Pipefix as manufactured by Sumner Corp. or approved equal.

2.06 DRAINAGE SPECIALTIES

A. Carriers:

1) Wall hung lavatories shall be supported with floor-mounted carriers to fit building conditions and fixtures specified. Each carrier shall be provided with a wall finishing frame. All carriers shall be secured to the floor with tie down lugs.

6) Wall mounting bracket.

7) Secondary thermostatic cold water by-pass valve with manifold to open on temperature rise.

8) Outlet dial thermometer (0-140°F, -10-60°C).

9) Top inlets and outlet.

10) Factory assembled and tested.

11) 0.5 to 8.7 GPM (1.8 to 33 1/min).

B. Expansion Compensators: Furnish and install as shown on the plans or where necessary to absorb expansion and contraction in copper, bronze, or brass pipe lines, Flexonics, or equal, Model HB Expansion Compensators having two-ply phosphor bronze bellows and brass shrouds and end fittings as manufactured by Flexonics Division of Calumet and Hecla Inc. Internal parts to be of non-ferrous metals. Size of Expansion Compensator to be in accordance to pipe size as noted on the plans.

C. Hot Water Expansion: Provide and install on domestic water heater; "supply side" expansion tanks equal to Amtrol Therm-X-Trol Model "ST" Series with ASME certification.

D. Miscellaneous Items:

1) Pressure Gauges: Trerice #890 Series 3-1/2" stainless steel case dial range 0-100 psi with 1 psi minor gradations gauge. Cocks Trerice Series #865 or #880.

2) Thermometers: Trerice industrial thermometer 9" adjustable angle brass stem A405 with socket and union hub. Temperature range 30 degrees F to 240 degrees F.

3) Pressure Relief Valves: Relief valves as shown on the drawings for domestic hot water generators shall be provided under Section 15450, Plumbing Equipment 2.01. The following shall be provided by the Plumbing Contractor:

a. All discharge piping shall be copper and the same size as the discharge diameter of the relief valve.

b. Pipe all relief valves to floor drains.

2.08 DOMESTIC COLD WATER SPECIALTIES

A. RPZ - Furnish and install in the mechanical areas where shown, reduced pressure type backflow preventer the equal of FEBCO as described:

SIZE	MODEL
1 1/4"	825Y w/ball valve shutoff with strainer

1) Furnish complete spare check valve and relief valve rubber kit for each reduced pressure backflow preventer.

B. Pressure Gauges: Furnish and install on main cold water supply line at the entrance and other noted locations

A. See Section 15250 - Insulation for information.

2.12 PLUMBING FIXTURES

A. See Section 15440 - Plumbing Fixtures for information.

2.13 PLUMBING EQUIPMENT

A. See Section 15450 - Plumbing Equipment for information.

2.14 SPECIAL SYSTEMS

A. See Section 15480 - Special Systems for information on Natural Gas.

PART 3: EXECUTION

3.01 INSPECTION

A. Prior to all work of this section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.

B. Verify that plumbing may be installed in strict accordance with all pertinent codes and regulations and the approved shop drawings.

C. In the event of discrepancy, immediately notify the Architect/Engineer.

D. Do not proceed with installation in areas of discrepancy until such discrepancies have been fully resolved.

3.02 INSTALLATION OF PIPING AND EQUIPMENT

A. General:

1) Install all piping promptly, capping or plugging all open ends and making pipe generally level and plumb, free from traps, and in a manner to conserve space for other work.

2) Provide uniform pitch of at least 1/8" per foot for all horizontal waste and soil piping within the building. Pitch all vent for proper drainage. Install vent piping with each bend 45 degrees minimum from the horizontal wherever structural conditions will permit.

3) Inspect each piece of pipe, tubing, fittings, and equipment for defects and obstructions. Promptly remove all defective material from the job site.

4) Install pipes to clear all beams and obstructions. Do not cut into or reduce the size of load carrying members without the approval of the Architect/Engineer.

5) Back vent fixtures as shown.

6) All risers and off-sets shall be substantially supported.

7) Pipe hangers shall be placed as follows: bell and spigot pipe - 5-'0" (at hub); steel piping except gas

A. General: Do not cover up or enclose work until it has been properly and completely inspected and approved.

B. Noncompliance: Should any of the work be covered up or enclosed prior to all required inspections and approvals, uncover the work as required and, after it has been completely inspected, make all repairs and replacements with such materials as are necessary to the approval of the Architect/Engineer and at no additional cost to the Owner.

3.05 TESTING

A. General: Tests shall be applied to the plumbing installation as required by codes and where directed by the Architect/Engineer, and in all cases before work is covered by earth fill or pipe covering.

B. Piping:

1) Sanitary systems shall be securely stopped, except at the highest point above the roof, and the entire system filled with water to the point of overflow. All leaks shall be repaired. Cracked pipes and fittings shall be removed and replaced. No doping of soil pipe or fittings will be allowed.

2) Hot and cold water piping shall be subjected to a hydrostatic pressure test of 150 psi and shall be repaired and repeated until work is tight.

3.06 CLEANING

A. Prior to acceptance of the buildings, thoroughly clean all exposed portions of the plumbing installation, removing all labels and all traces of foreign substance, using only a cleaning solution approved by the manufacturer of the plumbing item being careful to avoid all damage to finished surfaces.

END OF SECTION

SECTION 15440 - PLUMBING FIXTURES

PART 1: GENERAL

1.01 WORK INCLUDED

A. Furnish and install all plumbing fixtures shown on the drawings and as hereinafter scheduled. All fixtures are to be white vitreous china where not otherwise specified.

B. Refer to Section 01030 - Alternates to determine extent of, if any, work of this section that will be affected by any alternates if accepted.

1.02 RELATED WORK

A. Section 15400 - Plumbing

B. Section 15450 - Plumbing Equipment

1.03 QUALITY ASSURANCE

A. General requirements for plumbing fixtures, the associated trim and fittings necessary to make a complete installation from wall or floor connections to rough piping, and certain accessories shall conform to Fed. Spec. WW-P-541, unless otherwise indicated. Die-cast zinc alloy will not be accepted. Dimensions for lavatories and sinks are indicated in the following order: length, width (distance from wall), and depth.

1. Corrosion-Resistant Steel (CRS):

a. Plate, Sheet and Strip: CRS flat products shall conform to chemical composition requirements of any 300 series steel specified in Fed. Spec. QQ-S-766.

b. Finish: Exposed surfaces shall have standard polish (ground and polished) equal to finish No. 4.

1.04 APPLICABLE PUBLICATIONS

A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by basic designation only.

1. Federal Specification (Fed. Spec.):

OO-D-00566(3)
Dispenser, Drinking Water
QQ-S-766Q(S)
Steel Plates, Sheets and Strips, Corrosion Resistant
WW-P-541/1A
Plumbing Fixtures (Water Closets, Land Use)
WW-P-541/4A
Plumbing Fixtures (Lavatories, Land Use)
WW-P-541/5A
Plumbing Fixtures (Sinks, Kitchen and Service and Laundry Tub, Land Use)
WW-P-541/8A(1)

2. P-2 Lavatory-BF Height:

American Standard "Lucerne" #0355.012 vitreous china lavatory, faucet holes on 4" centers, concealed arm support, 20" x 18".

Mounting Height to Rim: 34" AFF.

Faucet: Speakman No. SC - 3075 4" center faucet, or approved equal, with washerless cartridge, 0.50 gpm flow restrictor, 4" wrist blade handles, chrome finish.

McGuire #H-170LK angle wall supply with wall flange, loose key stop, and 12" long flexible riser.

McGuire #155A 1 1/4" perforated grid drain, chrome plated.

McGuire #8090 adjustable swivel P-trap, 1-1/4" x 1-1/2", cleanout plug, #2127 brass nipple to wall with cast escutcheon.

Provide Truebro, Inc. or approved equal lavatory pipe insulation on supplies and waste.

Smith, Josam, Zurn or Wade concealed arm carrier to meet building conditions.

3. P-5 Shower and Stall - BF Use:

Aqua Bath Model C4136BF acrylic shower enclosure molded from a single sheet so as not to have any joints or seams, meeting ANSI Z124.2, backside fire rating of "A" and a flame spread of less than 30, designed to be ADA compliant and NAHB listed, inside dimensions of 36" x 36" x 78", outside dimensions of 41" x 37" x 84, A.D.A. fold up seat with phenolic slats, soap tray molded in corner 30" above the floor, wrap around grab bar 15-3/4" x 31-3/4" x 1-1/2" dia 18 gauge stainless steel, 18" straight grab bar, 1" diameter 18 gauge stainless steel curtain rod, ribbed floor and seat for slip resistance. Install in floor slab recess.

Symmons "Safetymix" No. 1-25-FSB-X shower unit with open flow hand spray, 5 foot metal clad hose, in-line vacuum breaker, 90^0 outlet with wall flange, #4-500 pressure balanced valve, 30" slide bar, all chrome plated.

4. P-3 Counter Sink - BF: Elkay or approved equal, 18 gauge, Type 302 satin finish stainless steel, seamlessly drawn, self-rimming, underside fully sound deadened, 1-3/4" radius coved corners, 1-1/2" diameter faucet holes, 3-1/2" drain openings, all required traps, stops, etc., modified as necessary to comply with A.D.A. requirements. Model LRAD-2522 with one (1) 6" deep compartment, three (3) faucet holes, and Speakman No. SC - 5705, 2 gpm swing gooseneck faucet, with 4" wrist blade handles, McGuire #151 basket strainer and tailpiece. Provide Truebro, Inc, insulation kits on supplies and waste.

5. P-7 Emergency Eye/Face Wash Unit - BF:

Guardian Model No. GBF-1721 or approved equal, wall mounted with four (4) gentle spray outlet heads, stainless steel skirt and bowl, ½" IPS brass stay-open ball valve operated by push flag handle, 1-1/4" IPS female outlet. Each spray head has removable spray cover, reticulated polyurethane filter, self-regulating flow control and float-off dust cover. Mounting height to rim: 34" AFF.

3.02 CLEANING

A. At completion of all work, fixtures, exposed materials and equipment shall be thoroughly cleaned according to manufacturer's recommendations.

END OF SECTION

SECTION 15450 - PLUMBING EQUIPMENT

PART 1: GENERAL

1.01 WORK INCLUDED

A. Furnish and install all plumbing equipment shown on the drawings and as hereinafter scheduled, to include, but not limited to the following:

1) Domestic Water Heater.

B. Refer to Section 01030 - Alternates to determine extent of if any, work of this section that will be affected by any alternates if accepted.

1.02 RELATED WORK

A. Section 15400 - Plumbing

B. Section 15440 - Plumbing Fixtures

1.03 QUALITY ASSURANCE

A. General requirements for plumbing equipment, the associated trim and fittings necessary to make a complete installation.

1.04 SUBMITTALS

A. In accordance with Section 15400 - Plumbing, furnish the following:

1. Manufacturer's Literature and Data:

a. Water to Water Heat Exchangers

1.05 PROJECT CONDITIONS

A. Regulatory Requirements: Installation shall meet all local, state, etc. codes.

PART 2: PRODUCTS

2.01 DOMESTIC WATER HEATER

A. General: Furnish and install an indirect-fired water heater equal to Super-Stor commercial hot water maker SS-30-DP, or approved equal.

B. Main components and features for WH10C:

1) Hydrostatic work pressure of 150 PSIG (Meet U.L. 174).

2) Vacuum Breaker.

SECTION 15480 - SPECIAL SYSTEMS

PART 1: GENERAL

1.01 DESCRIPTION

A. Work includes, but is not limited to:

1. Natural Gas Piping System

B. Related work specified elsewhere:

1. Section 15050 - Basic Methods and Requirements.

2. Section 15400 - Plumbing.

1.02 REGULATORY REQUIREMENTS

A. Installation of the gas system shall meet the requirements of the NFPA No. 54, National Fuel Gas Code and applicable ANSI Codes.

B. Work done by this Contractor shall conform to Northern Utilities, Inc. requirements and to local and State codes having jurisdiction. All codes, standards and requirements applicable to this installation are considered a part of these specifications.

1.03 SUBMITTALS

A. In accordance with Section 15050 - Basic Methods and Requirements (Mechanical) furnish the following:

1. Manufacturer's Literature and Data:

a. Natural gas piping and fittings.

b. Valves, Etc.

2. Samples: None in this section.

3. Manuals - Maintenance and Operating: None.

4. Shop Drawings: Final Piping and Equipment Layout.

PART 2: PRODUCTS

2.01 PIPING AND ACCESSORIES

A. General: Provide all piping and accessories for a complete system.

g. The entire installation should conform to applicable NFPA requirements, Northern Utilities, Inc. requirements, and local and state codes.

h. Caulk the spaces between the pipe and walls, ceilings and floor, gas and water tight.

i. Provide a sufficient number of unions to allow the for the dismantling of all piping.

2. Joints and Connections:

a. Smoothly ream all cut pipe. Cut all threads straight and true. Remove cutting and threading burrs before assembling piping. Apply best quality dope to all male pipe threads, but not to inside the fittings. Do not use pipe with threads which are chipped, stripped or damaged.

b. Pipe joints shall be threaded or welded. Fittings shall be malleable cast iron. Joint compounds shall be chemically resistant to the action of natural gas.

c. All valve connections shall be of the threaded type.

d. All joints on concealed piping shall be welded, using wrought steel buttwelding fittings.

3. Plug each gas outlet, including valves, with threaded plug or cap immediately after installation and retain until continuing piping, or until equipment connections are completed.

4. Ground gas piping electrically and continuously within project, and bond tightly to grounding connection.

5. Install drip-legs in gas piping where indicated, and where required by code or regulation.

6. Install "Tee" fitting with bottom outlet plugged or capped, at bottom of pipe risers.

7. Use dielectric unions where dissimilar metals are joined together.

8. Install piping with 1/64" per foot (1/8%) downward slope in direction of flow.

9. Install piping parallel to other piping, but maintain minimum of 12" clearance between gas piping and hydronic piping above 200° F (93°C).

10. Insulate gas piping exposed to freezing temperatures.

C. Closing in Uninspected Work:

1. General: Do not cover up or enclose work until it has been properly and completely inspected and approved.

2. Noncompliance: Should any of the work be covered up or enclosed prior to all required inspections and approvals, uncover the work as required and, after it has been completed inspected and approved, make all repairs and replacements with such materials as are necessary to the approval of the Architect/Engineer and at no additional cost to the Owner.

b. Equipment which is not to be included in the test shall be either disconnected from the piping or isolated by blanks, blind flanges or caps. Flanged joints at which blinds are inserted to blank off other equipment during the test need not be tested.

c. When the piping system is connected to equipment or components designed for operating pressures of less than the test pressure, such equipment shall be isolated from the piping system by disconnecting them and capping the outlet(s).

d. When the piping system is connected to equipment or components designed for operating pressures equal to or greater than the test pressures, such equipment shall be isolated from the piping system by closing their individual manual shutoff valve(s).

e. All testing of piping systems shall be done with due regard for the safety of employees and the public during the test. Bulkheads, anchorage and bracing suitably designed to resist test pressures shall be installed if necessary. Prior to testing, the interior of the pipe shall be cleared of all foreign material.

4. Test Pressure:

a. Pressure shall be measured with a manometer or an equivalent device so calibrated as to read in increments of not greater than one-tenth pound. The source of pressure shall be isolated before the pressure tests are made.

b. The test pressure to be used shall be 50 psig.

c. Test duration shall be eight hours.

5. Detection of Leaks and Defects:

a. The piping system shall withstand the test pressure specified without showing any evidence of leakage or other defects. Any reduction of test pressures as indicated by pressure gages shall be deemed to indicate the presence of a leak unless such reduction can be readily attributed to some other cause.

b. The leakage shall be located by means of an approved combustible gas detector, soap and water, or an equivalent nonflammable solution, as applicable. Matches, candles, open flames, or other methods which could provide a source of ignition shall not be used. Caution: Since some leak test solutions, including soap and water, may cause corrosion or stress cracking, the piping shall be rinsed with water after testing, unless it has been determined the leak test solution is noncorrosive. When leakage or other defects are located, the affected portion of the piping system shall be repaired or replaced and retested.

6. Test Records: Records shall be made of inspection and all tests performed. These records shall indicate which portions of the piping system conform to this code or were pressure tested.

7. Leakage Check After Gas Turn On:

a. Before Turning Gas On: Before gas is turned into a system of new gas piping, or back into an existing system after being shut off, the entire system shall be checked to determine that there are no open fittings or ends and that all valves at outlets and equipment are closed.

SECTION 15500 - HEATING, VENTILATING AND AIR CONDITIONING

PART 1: GENERAL

1.01 WORK INCLUDED

A. Furnish all labor, materials, equipment, supplies and perform all operations to complete the HVAC work in accordance with the drawings and these specifications which includes, but is not limited to the following:

1. Hot Water Heating Piping System
2. Hot Water Specialties
3. H.V.A.C. Pumps

1.02 RELATED WORK

A. Section 15050 - Basic Mechanical Materials and Methods

B. Section 15250 - Mechanical Insulation

C. Section 15550 - Heat Generation

D. Section 15750 - Heat Transfer

E. Section 15850 - Air Handling

F. Section 15950 - Controls

G. Section 15990 - Testing, Adjusting and Balancing

1.03 SUBMITTALS

A. In accordance with Section 15050 - Basic Mechanical Materials and Methods, furnish the following:

1. Manufacturer's Literature and Data:
   a. All Pumps
   b. Hot Water Specialties
2. Manuals - Maintenance and Operating:
   a. Pumps

1.04 PROJECT CONDITIONS

A. Regulatory Requirements:

2. Make nipples of same material and weight as pipe whereon used, except when length of un-threaded part of standard weight nipple is less than 1-1/2", use extra strong pipe nipple.

3. Close nipples shall not be used except where specific approval is obtained.

D. Valves shall be as manufactured by Nibco, Jenkins, Crane, Walworth, Milwaukee or approved equal.

1. Gate Valves:

a. 2" and Smaller: 125 lb. S.W.P., all bronze, non-rising, screwed bonnet, one-piece wedge, designed to permit repacking under pressure. Solder or threaded ends as applicable. Equal to Nibco T-123 or S-123 (Milwaukee 1105 or 1145).

b. 2-1/2" to 3": 125 lb. S.W.P., all bronze, non-rising, screwed bonnet, solid wedge equal to Nibco T-124 or S-124.

c. 3" and Larger: 125 lb. S.W.P., flanged, iron-body, bronze-mounted, designed larger to permit repacking under pressure. Equal to Nibco F-619 (Milwaukee F2882M). Provide chain operators where indicated.

d. Boiler Valves on Supply and Return: 125 lb. S.W.P., flanged, iron-body, outside screw and yoke type, bronze-mounted, designed to permit repacking under pressure. Equal to Nibco F-617-0 (Milwaukee F2885M), with chain operators on supply.

2. Globe and Angle Valves:

a. 2-1/2" and Smaller: 150 lb. S.W.P., all bronze rising stem, union bonnet, renewable composition disk, designed to permit repacking under pressure. Solder or threaded ends as applicable. Equal to Nibco T-235 or S-235 (Milwaukee 590T or 1590T).

b. 3" and Larger: 125 lb. S.W.P., flanged, iron-body, bronze mounted, rising stem, renewable composition disk, designed to permit repacking under pressure. Equal to Nibco F-718Y (Milwaukee F2981-M).

3. Check Valves:

a. 2-1/2" and Smaller: 125 lb. S.W.P., all bronze, horizontal swing-type, screwed caps, bronze disk, designed to allow re-grinding of seat without removal of valve body. Solder or threaded ends as applicable. Equal to Nibco T-413B or S-413B (Milwaukee 509 or 1509).

b. 3" and Larger: 125 lb. S.W.P., flanged, iron-body, bronze mounted, horizontal swing-type, bronze disk or bronze faced disk. Equal to Nibco F-918B (Milwaukee F-2974-M).

c. On Pump with Discharge: Non-slam check valves equal to Nibco 125 lb., Type T-480 (only goes to 2" - Taco FLO-CHEK 4") (Milwaukee series 1400 wafer style silent check valve) bronze body, trim and stainless steel spring.

5. Where exposed piping passes through walls, floors, partitions, cabinet work and ceilings, provide and set chrome-plated brass floor and ceiling plates of approved design with depth to cover sleeve-projection through floor or wall. Ceiling plates are not required on insulated piping.

H. Hangers and Supports:

1. Piping suspended from overhead shall be supported by approved wrought or malleable iron hangers with adjustable solid mild steel rods except as noted.

2. Piping of 6" size or larger shall be supported by approved steel cast iron or malleable iron single rod roll type hangers with pipe covering protection saddles.

3. Piping smaller than 6" size shall be supported by approved clevis type hangers.

4. Piping run on side walls or partitions shall be supported by malleable iron brackets, adjustable swivel rings and rod hangers.

5. Hangers and support shall be as manufactured by Grinnell Co., Inc. or approved equal.

6. Pipe supports on copper tubing shall be all copper.

2.06 WATER SPECIALTIES

A. General: Furnish and install all hot water specialties as indicated and required for a complete installation. Specialties shall be as manufactured by Bell and Gossett, Sarco, Armstrong, Taco, Dole, Amtrol, or Honeywell-Braukmann.

B. Main Components and Features:

1. Drain Valves at all low points complete with hose end and caps.

2. Automatic Air Vents at major high points in system and at all high points serving units with outside air connection. Pipe to floor drain. Provide pet cock shut off. Automatic air vents shall be Armstrong 21AR or Honeywell-Braukmann EA122-A.

3. Manual Vents with air chambers at other high points shall be Dole No. 10, or approved equal, with 1/8" IPS connection, key-operated. Furnish ten keys.

4. Shut-Off Valves and Balancing Fittings shall be provided at each radiation unit or element, including heating units, etc. Radiation shut-off valves shall be Sarco series 37, Bell & Gossett "SV", or approved equal. Valves shall be lock- shield construction. Balancing fitting shall be Sarco Balance Master or approved equal combination balancing fitting and tight shut-off valve. NOTE: Valves and balancers shall be located for easy access. Valves and fittings as manufactured by Sarco, Dunham-Bush, or Taco.

5. Flow Indicator Devices: Provide flow indicator devices (flowmeter, balancing and tight shut-off) at each secondary loop, at each reheat coil, at each pump, at main branches serving radiation and additional locations indicated on the drawings.

14. Pressurized Diaphragm or Bladder Type Expansion Tank: For use on chilled water secondary system rated at max. of 75 psi equal to Taco Series 440.

15. Pressure Reducing Valves equal to Taco No. 335 bronze or Honeywell-Braukmann DO6U.

16. Pressure Relief Valves shall be ASME rated for 1.5 times the capacity of equipment being protected.

PART 3: EXECUTION

3.01 PIPING - GENERAL

A. Provide and erect in a workmanlike manner, all piping shown and required to complete the installation intended. Erect piping to allow sufficient clearance for expansion, application of insulation and finish painting with offsets as required to avoid other work.

B. Sizes and general arrangement, as well as methods of connecting all piping, valves, equipment, etc., shall be as indicated, or so as to meet the requirements of the Architect/Engineer.

C. All pipe used is to be new material, and all threads on piping must be full length and clean-cut with inside edges reamed smooth to full inside bore.

D. Caulking of threads will not be allowed on any piping.

E. Pipe joint compound shall be put on male thread only.

F. In the erection of mains, special care must be used in the support, working into place without springing or forcing.

G. Make such offsets as are shown and required to place the pipes and risers in proper position to avoid other work.

H. Pipes shall be anchored, guided, etc., where necessary, to prevent vibration or to control expansion.

I. Install a sufficient number of flanged fittings or unions to facilitate making possible future alterations or repairs. Unions shall be installed at all equipment, traps, fixtures and risers.

J. Piping shall be erected so as to provide for the easy passage and noiseless circulations of water, steam and condensation under all working conditions.

K. Provide ½" minimum size valved draw-offs with hose connection at all low points of the piping systems, apparatus, etc. Steel piping shall be installed by the use of oxyacetylene or electric welding process. Piping 3" and larger, and all expansion loops shall have butt welds and welded fittings, standard factory-fabricated tees, elbows, reducers, caps, etc. Branch outlets, 2-1/2" and smaller shall be made by the use of approved welding type ½ couplings, "Weldolet" or "Thredolet" fittings.

1. Piping smaller than 3" except as noted may be installed at the Contractor's option with welding type, or threaded type fittings, except all piping regardless of size concealed upon completion of building construction, shall be welded.

2. All anchors and guide from joist construction shall be supported from steel beams or angle iron and other steelwork provided and installed between three adjoining joists.

3. Support all horizontal piping of steel wrought iron and brass as per following schedule:

PIPE SIZE	ROD DIAMETER	MAXIMUM SPACING
Up to 1-1/4" (Incl.)	3/8"	8'0"
1-1/2" and 2"	3/8"	10'0"
2-1/2" and 3"	½"	10'0"
4" and 5"	5/8"	12'0"
6" and larger	3/4"	12'0"

4. Provide and set all required hangers, clamps, plates, beams, brackets, anchors, guides, expansion bolts, and ironwork required to support all piping and equipment.

END OF SECTION

SECTION 15550 - HEAT GENERATION

PART 1: GENERAL

1.01 WORK INCLUDED

A. Furnish all labor, materials, equipment, supplies and perform all operations necessary to complete the heat generation work in accordance with the drawings and these specifications to include, but not limited to:

1) Boiler - Burner Package Unit

2) Boiler Accessories

3) Pre-Fabricated Chimney Stacks

4) Furnaces

1.02 RELATED WORK

A. Section 15050 - Basic Mechanical Materials and Methods

B. Section 15250 - Mechanical Insulation

C. Section 15480 - Special Systems

D. Section 15500 - Heating, Ventilating and Air Conditioning

E. Section 15750 - Heat Transfer

F. Section 15880 - Air Distribution

G. Section 15950 - Controls

H. Section 15990 - Testing, Adjusting and Balancing

1.03 SUBMITTALS

A. In accordance with Section 15050 - Basic Mechanical Materials and Methods, furnish the following:

1. Manufacturer's Literature and Data:

a. Boiler - Burner Unit

b. Boiler Accessories

c. Breeching and Stacks

d. Furnaces

2) Insulated metal jacket of not less than 2" thick glass fiber insulation.

3) Painting: Entire boiler, base frame and other components shall be factory painted.

4) Minimum 1" boiler drain down valve.

5) Relief valve set at 45 psi.

6) Temperature: Pressure gauge combination.

7) Low Water Cut-Off Unit: Wired into the burner control. Circuit to stop burner operation if boiler water falls.

C. Gas Burner: The gas burner shall be UL tested set to burn natural gas with the following standard equipment and/or accessories.

1) High radiant annular entry type burner. Set up to fire natural gas.

2) Gas Piping at Burner: Integrally mounted on unit gas pressure regulating devices.

3) Burner Control shall operate on the "on-off" principle.

4) Operating Controls: Provide Honeywell controls as follows.

a. One operating temperature control

b. One manual reset high limit control.

2.09 MANUFACTURED STACKS

A. General: Furnish and install exhaust gas removal system for the gas fired MUA unit. Stacks shall be as manufactured by Metalbestos, Metal-Fab, or approved equal.

B. Main Components and Features:

1. Stacks shall be U.L. approved for gas natural draft, Type "B".

2. Units shall be lined with corrosive resistant material.

3. Units shall be air insulated.

4. Provide all accessories for complete installation (roof thimble, roof cap, support tee tie-in, cleanouts, etc.,).

C. Gas Piping: Provide all required connections, valves, etc. See other sections of this division and the drawings.

D. Start-Up: The gas burning system shall be started up and adjusted by the manufacturer's representative at the time of supplying temporary heat and at the completion of the work.

E. Instruction: The manufacturer's representative shall provide the instructions to the Owner's representative as to the proper care and operation.

F. Guarantee: Contractor shall guarantee the entire installation for a period of one year from the date of final certificate of payment and maintain apparatus in satisfactory operating condition for the period of guarantee without additional cost to the Owner.

END OF SECTION

SECTION 15700 - LIQUID HEAT TRANSFER

PART 1: GENERAL

1.01 DESCRIPTION

A. Work includes, but is not limited to the following:

1. Hot Water Heating Piping System
2. Hot Water Specialties
3. Radiation
4. Cabinet and Unit Heaters
5. Pumps

B. Related Work Specified Elsewhere:

1. Section 15050 - Basic Methods and Requirements
2. Section 15250 - Insulation
3. Section 15600 - Power or Heat Generation
4. Section 15650 - Refrigerant
5. Section 15800 - Air Distribution
6. Section 15900 - Controls and Instrumentation

1.02 REGULATORY REQUIREMENTS

A. Installation shall meet all local, state, etc., codes.

B. All welding shall be executed only by certified welding mechanics in accordance with the best practice of the trade.

C. All pressure vessels shall be constructed, tested and stamped in accordance with ASME code.

1.03 SUBMITTALS

A. In accordance with Section 15050 - Basic Methods and Requirements - Mechanical, furnish the following:

1. Manufacturer's Literature and Data:

a. Finned Radiation

b. Unit Heaters

2. Provide with thermal overload type disconnect switch mounted on heater casing.

C. Other Requirements: The control of temperatures will be as hereinafter specified.

2.03 RADIATION

A. General: Furnish and install radiation of sizes, type and service in locations indicated on the drawings and as scheduled by Trane, Vulcan or Sterling or approved equal by Standard Fin Pipe.

B. Main Components and Features: Provide enclosure as indicated on the drawings complete with cover, brackets, fin pipe, sliding hangers, fittings, end caps, etc.

1. Covers: 16 gauge finished in baked gray enamel primer.

2. Backs: Partial wall back plate with gasket of 20 gauge bonderized steel.

3. Hangers: Nylon cradle guides shall glide fin pipe for quiet operation or approved equal system. Maximum spacing between brackets shall be 3'.

4. Fin Pipe: shall be of steel elements and steel tube.

5. Dampers: shall be full length of covers and capable of reducing output by 50%.

C. Other Requirements:

1. Mounting Heights: All radiation shall be installed as scheduled.

2. Painting: Radiation covers will be painted under other sections of these specifications.

2.04 WATER SPECIALTIES

A. General: Furnish and install all hot water specialties as indicated and required for a complete installation. Specialties shall be as manufactured by Bell and Gossett, Sarco, Armstrong, Taco, or Dole.

B. Main Components and Features:

1. Drain Valves: at all low points complete with hose end and caps.

2. Automatic Air Vents: at major high points in system and at all high points serving units with outside air connection. Pipe to floor drain. Automatic air vents shall be Armstrong 21AR.

3. Manual Vents: with air chambers at other high points shall be Dole No. 10, or approved equal, with 1/8" IPS connection, key-operated. Furnish ten keys.

4. Shut-Off Valves and Balancing Fittings: shall be provided at each radiation unit or element, including heating units, etc. Radiation shut-off valves shall be Sarco series 37, or approved equal. Valves shall be lock- shield construction. Balancing fitting shall be Sarco Type IBC or approved equal combination balancing fitting and tight shut-off valve. NOTE: Valves and balancers shall be located for easy access. Valves and fittings as manufactured by Sarco, Dunham-Bush, or Taco.

PART 3: EXECUTION

3.01 PIPING - GENERAL

A. Provide and erect in a workmanlike manner, all piping shown and required to complete the installation intended. Erect piping to allow sufficient clearance for expansion, application of insulation and finish painting with offsets as required to avoid other work.

B. Sizes and general arrangement, as well as methods of connecting all piping, valves, equipment, etc., shall be as indicated, or so as to meet the requirements of the Architect/Engineer.

C. All pipe used is to be new material, and all threads on piping must be full length and clean-cut with inside edges reamed smooth to full inside bore.

D. Caulking of threads will not be allowed on any piping.

E. Pipe joint compound shall be put on male threads only.

F. In the erection of mains, special care must be used in the support, working into place without springing or forcing.

G. Make such offsets as are shown and required to place the pipes and risers in proper position to avoid other work.

H. Pipes shall be anchored, guided, etc., where necessary, to prevent vibration or to control expansion.

I. Install a sufficient number of flanged fittings or unions to facilitate making possible future alterations or repairs. Unions shall be installed at all equipment, traps, fixtures and risers.

J. Piping shall be erected so as to provide for the easy passage and noiseless circulations of water, steam and condensation under all working conditions.

K. Provide ½" minimum size valved draw-offs with hose connection at all low points of the piping systems, apparatus, etc. Steel piping shall be installed by the use of the oxyacetylene or electric welding process. Piping 3" and larger, and all expansion loops shall have butt welds and welded fittings, standard factory-fabricated tees, elbows, reducers, caps, etc. Branch outlets, 2-1/2" and smaller shall be made by the use of approved welding type ½ couplings, "Weldolet" or "Thredolet" fittings.

1. Piping smaller than 3" except as noted may be installed at the Contractor's option with welding type, or threaded type fittings, except all piping regardless of size concealed upon completion of building construction, shall be welded.

2. Expansion offset shall be installed with long radius welding elbows.

3. All welding shall be executed only by certified welding mechanics in accordance with the best practice of the trade.

to Walworth No. 4 or 4SJ.

3" and	125 lb. W.S.P., flanged, iron-body, bronze-mounted, designed larger + - to permit repacking under pressure. Equal to Walworth No. 719F. Provide chain operators where indicated.
Boiler Valves on Supply and return	125 lb. W.S.P., flanged, iron-body, outside screw and yoke type, bronze-mounted, designed to permit repacking under pressure. Equal to Walworth No. 726F, with chain operators on Connections supply.

2. Globe and Angle Valves:

2-1/2" and smaller	150 lb. W.S.P., all bronze rising stem, union bonnet, renewable composition disk, designed to permit repacking under pressure. Solder or threaded ends as applicable. Equal to Walworth No. 95 or No. 95SJ.
3" and larger	125 lb. W.S.P., flanged, iron-body, bronze mounted, rising stem, renewable composition disk, designed to permit repacking under pressure. Equal to Walworth No. 914F.

3. Check:

2-1/2" and smaller	125 lb. W.S.P., all bronze, horizontal swing-type, screwed caps, bronze disk, designed to allow regrinding of seat without removal of valve body. Solder or threaded ends as applicable. Equal to Walworth No. 406 or No. 406SJ.
3" and larger	125 lb. W.S.P., flanged, iron-body, bronze mounted, horizontal swing-type, bronze disk or bronze faced disk. Equal to Walworth No. 928F.
On Pump Discharge	Non-slam check valves equal to Nibco 125 lb., Type T-480 with bronze body, trim and stainless steel spring.

4. Plug Valves:

2-1/2" and smaller	175 lb. W.O.G., cast iron round port openings, lubricated, wrench operated. Equal to Walworth No. 1796.
3" and larger	125 lb. W.S.P., high strength cast iron, round port openings, lubricated, wrench operated. Equal to Walworth No. 1797F.

5. Ball Valves: IN26125 SWP on process and chilled water feeds to equipment. Equal to Nibco #580.

F. Strainers: shall be 125 lb. cast iron screwed, equipped with stainless steel removable mesh screen and manufactured by Armstrong, Muessco, or Barnes and Jones equal to Muessco No. 751. Provide valved drain on strainers serving pumps.

G. Bolts, Gaskets and Stuffing:

7. Support all horizontal piping of steel wrought iron and brass as per following schedule:

PIPE SIZE	ROD DIAMETER	MAXIMUM SPACING
Up to 1-1/4"	3/8"	8'0"
1-1/2" and 2"	3/8"	10'0"
2-1/2" and 3"	½"	10'0"
4" and 5"	5/8"	12'0"
6" and larger	3/4"	12'0"

8. Provide and set all required hangers, clamps, plates, beams, brackets, anchors, guides, expansion bolts, and ironwork required to support all piping and equipment.

9. Hangers and support shall be as manufactured by Grinnell Co., Inc. or approved equal.

10. Pipe supports on copper tubing shall be all copper.

END OF SECTION

SECTION 15850 - AIR HANDLING

PART 1: GENERAL

1.01 WORK INCLUDED

A. Furnish all labor, materials, equipment, supplies and perform all operations necessary to complete the air handling work in accordance with the drawings and these specifications to include, but not be limited to, the following:

1. Make Up Unit
2. Exhaust Fans
3. Air Filter Rack Systems

1.02 RELATED WORK

A. Section 15050 - Basic Mechanical Materials and Methods

B. Section 15500 - Heating, Ventilating and Air Conditioning

C. Section 15750 - Heat Transfer

D. Section 15880 - Air Distribution

E. Section 15950 - Controls

F. Section 15990 - Testing, Adjusting and Balancing

1.03 SUBMITTALS

A. In accordance with Section 15050 - Basic Mechanical Materials and Methods, furnish the following:

1. Manufacturer's Literature and Data:
   a. Make Up Air Unit
   b. Exhaust Fans
   c. Air Filter Rack System
2. Manuals - Maintenance and Operating:
   a. Air Make Up Unit

1.04 PROJECT CONDITIONS

A. Regulatory Requirements: Installation shall meet all local, state, etc., codes.

d. Filters. The filter rack shall be constructed of galvanized steel with access through the side service panel. Throwaway pleated 2" filters are to be installed with 2 spare sets of filters provided.

e. Electrical Cabinet. The electrical cabinet shall be isolated from the air stream with a nonremovable access panel interior to the outer service panel. There is provision in this cabinet for component mounting, wire routing and high voltage isolation. Motor and control wiring shall be harnessed with terminal block connections.

f. Controls (furnace one only). Standard units shall be provided with a 24-volt combination single-stage automatic gas valves, including a main operating valve and pilot safety shutoff, pressure regulator, manual main and pilot shutoff valve, and an adjustable pilot valve. Gas valves shall be suitable for NEC Class 2 use.

Each duct furnace shall be provided with a 24-volt high temperature limit switch, a (redundant) combination gas valve and a fan time delay relay. The fan time delay relay delays the fan start until the heat exchanger reaches a predetermined temperature. It also allows the fan to operate after burner shutdown, removing residual heat from the heat exchanger. Double and triple furnace units shall contain a reverse airflow interlock switch. The normally closed switch, when activated, shall cause gas valves to close and continue blower operation.

All units are provided with a solid state ignition control system which ignites the intermittent pilot by spark during each cycle of operation. When the pilot flame is proven, the main burner valve opens to allow gas flow to the burners. Pilot and burners are extinguished during the off cycle.

g. Electronic Modulating - 4-20 mA/0-10 VDC Input. Provides modulated heat output. Ignition is at full fire (100% input), and modulates the gas input from 100% to 40% rated input.

The modulating gas valve shall operate in response to a 4-20 mA or a 0-10 VDC input from an external DDC control. When "furnace one only" is specified on double and triple furnaces, additional furnace sections will have single-stage on-off control.

h. Motors - General. All motors shall be ball bearing type with resilient base mount. Windings are Class "B," 1800 rpm with service factors of ½ - 3/4 hp = 1.25 and 1 - 5 hp = 1.15.

I. Single-speed Open Drip-proof 60 HZ/1800 RPM. Single-Phase (with magnetic starter) - 230V motors 2 hp models.

j. Dampers. Dampers shall be of the opposed blade type, constructed of galvanized steel with neoprene nylon bushings, blades to be mechanically interlocked.

k. OA/RA Motor With External 4-20 mA or 0-10VDC Analog Input. A modulating motor interlocked with outside and return air dampers shall be provided. The motor shall modulate the position of the outside and return air dampers in response to a 4-10 mA or 0-10VDC signal supplied by an external DDC controller.

l. Firestat. If the temperature reaches the setpoint, the unit will close all gas valves, return the dampers to their normal position and shut down the blower. Automatic reset.

2.03 CENTRIFUGAL TYPE BLOWERS (EXHAUST OR SUPPLY)

A. General: Furnish and install Penn, Chicago Blower, & Carmon or approved equal, fans sized and with capacities indicated. Fan shall have a certified rating authorized by AMCA

B. Main Components and Features:

1. Steel fan housing.

2. Non-overloading, centrifugal fan wheel.

3. Motor mountings with rubber-in-shear vibration eliminators.

4. Grease lubricated, heavy duty cast iron pillow and block type bearings supported independent of fan housing.

5. Adjustable V-belt drive with adjustable speed pulley.

6. Hinged cover and belt guard with opening to apply tachometer to fan shift.

7. Single speed open motor on adjustable support.

8. Motor starter with overload protection with magnetic starter and "on-off- auto" switch on cover, or remote push button control with pilot light where indicated.

9. Housing mounted, "on-off switch".(Motors of required size with disconnect switch mounted on unit).

10. Unit furnished shall have been tested and rated in accordance with AMCA Bulletin No. 110.

C. Other Requirements: See drawings and schedule for special requirements.

PART 3: EXECUTION

3.01 EQUIPMENT INSTALLATION

A. General: Install units according to plans, specifications and manufacturer's recommendations.

B. Other Requirements:

1. Provide all accessories to make a complete job.

2. Support units rigidly so they remain stationary at all times.

END OF SECTION

SECTION 15880 - AIR DISTRIBUTION

PART 1: GENERAL

1.01 WORK INCLUDED

A. Furnish all labor, materials, equipment, supplies, and perform all operations necessary to complete the air distribution work in accordance with the drawings and these specifications to include, but not be limited to, the following:

1. Ductwork
2. Duct Accessories
3. Registers Grilles, Diffusers, and Accessories

1.02 RELATED WORK

A. Section 15050 - Basic Mechanical Materials and Methods

B. Section 15250 - Mechanical Insulation

C. Section 15750 - Heat Transfer

D. Section 15850 - Air Handling

E. Section 15950 - Controls

F. Section 15990 - Testing, Adjusting and Balancing

1.03 SUBMITTALS

A. In accordance with Section 15050 - Basic Mechanical Materials and Methods, furnish the following:

1. Manufacturer's Literature and Data:
   a. Registers, Grilles, Diffusers, Louvers and Accessories
   b. Duct Accessories, including Volume Dampers, Lining, etc.
   c. Fire Dampers

1.04 PROJECT CONDITIONS

A. Regulatory Requirements:

1. Installation shall meet all local, state, etc., codes.
2. Fabricate and install sheet metal in accordance with applicable requirements of the ASHRAE Guide, SMACNA Manuals, and Industrial Ventilation, latest edition.

2.04 DUCT ACCESSORIES

A. General: Provide and install all ductwork accessories of sizes and design as shown on the drawings or specified.

B. Main Components and Features:

1. Fire Dampers shall be factory fabricated with UL label equal to Prefco Products Model 5500SF-LPB, or approved equal. Each damper shall be rated for 1 1/2 hours, spring operated for closure under dynamic air flow conditions.

2. Flexible Connections shall be neoprene coated glass fabric with sewed seams equal to Vent Glass or Duro-Dyne (Metal-Fab).

PART 3: EXECUTION

3.01 SHEET METALWORK AND MATERIALS

A. General: Furnish and install all required sheet metalwork, including: intake ducts, manual dampers, fire dampers, smoke dampers, turning vanes, deflectors, manual operators, louvers and screens, grilles, registers, diffusers, collars, sleeves, baffles, acoustic linings, access doors, flexible connections, supports, etc., for the complete installation in accordance with the intent of the drawings and specifications.

1. Furnish and install fresh air connections for air unit, etc., and all duct work connected to units, exhaust louvers, and other equipment furnished under other sections of these specifications.

2. Toilet venting shall conform to Maine Plumbing Code.

3. Furnish and install hoods.

4. General exhaust.

5. Fume exhaust.

6. Exposed spiral duct supply and return.

B. Installation: Fabricate and install in accordance with applicable requirements of the ASHRAE Guide and SMACNA Manual. Ductwork shall conform to 2" SMACNA Pressure Class except where SMACNA requirements are exceeded by these specifications. Ductwork shall be neat, accurate, rigidly constructed and mechanically tight, as well as substantially airtight and shall provide quiet system of air transportation. Offsets of exposed ductwork shall be made on sides opposite to walls and ceilings, unless otherwise shown on the drawings or specified. Sizes, as marked on the drawings, shall be adhered to as closely as possible. The right is reserved to vary the size of ducts and flues to accommodate structural conditions during the progress of the work, without additional cost to the Owner.

C. Materials: Ductwork shall be of galvanized sheet metal or aluminum where indicated. Galvanized sheet metal shall be new copper bearing (or prime grade) galvanized steel sheets of lock-forming quality. Zinc coating that will flake or peel under any forming operation, or laminated sheets will not be allowed.

a. Spiral Duct: Spiral duct shall be double-walled internally insulated equal to acousti-k27. Spiral duct shall have Type "P" perforated liner for noise control. The outer pressure sheet and inner liner shall be fabricated of galvanized steel meeting ASTM-A-527-67. Thermal insulation, 1", shall have a thermal conductivity "K" factor of 0.27 at 75 degree mean temperature. Connections shall be the standard slip joint fastened and sealed for rating up to 6" wg pressure. The following chart shows minimum gauges:

Normal Size Range	3" - 12"	13" - 24"	25" - 34"
Solid Spiral Wound Duct Outer Pressure Shell	26 GA	24 GA	22 GA
Solid Welded Fitting Outer Pressure Shell	20 GA	20 GA	20 GA

The construction shall have mechanical means to maintain positive concentricity liner with shell and mechanical means to retain insulation against dislocation by assembly processes. Provide all required fittings hangers, etc., for a complete installation. Provide single wall spiral duct where indicated on drawings.

b. All fittings and accessories such as access doors, couplings, etc., shall be matched to the ductwork system and provided by the ductwork manufacturer.

c. Details: Submit details of proposed joint sealing system. Approved factory-made joints system shall be used. Provide manufactured typed test holes with gaskets, etc., for instrument holes, etc.

D. Construction: Seams, joints, bracing angles and stiffeners.

1. Longitudinal Seams: Longitudinal joints in ducts not exceeding 60" in either dimension, and ducts exceeding 60" in the larger dimension but not exceed 18" in the smaller dimension, shall be either Pittsburgh lockseams or grooved seams.

2. Round Ducts: The downstream end of each section of round duct shall be crimped and beaded. Assembly shall be made by inserting the crimped end into the upstream end of the adjoining section. The joints shall be fastened in place by three or more sheet metal screws spaced not over eight inches apart.

Alternative joint/reinforcement methods may be used, subject to approval by the Engineer, provided that the rigidity classification is met.

Lock type as described in SMACNA Low Velocity Duct Manual.

a. Transverse Joints: Drive slips shall be used on short sides of transverse duct joints if side is less than 18". Metal and thickness of S slips and drive slips shall be same as duct. Ends of drive slips shall be bent over at least 1/2" at corners. Bar slips shall be fastened with sheet metal screws on 12" centers. Corners of all bar slip joints shall be folded over and riveted. Where intermediate type reinforcements are used as supplements for joints, they shall be attached to duct wall within 3" of the joint.

b. Stiffeners: All ducts over 18" wide shall be provided with stiffeners which may be either transverse joints or angle bracing, as indicated above. The center-to-center spacing of stiffeners shall not be over four feet for ducts not exceeding 60" (long side) and shall not be over two feet for ducts not exceeding eight feet in any case. Flat area of uninsulated ducts over 18" wide shall be stiffened by cross-breaking. Uninsulated exposed ducts shall have flat bar reinforcement and flush seams in lieu of bracing angles and projecting seams.

c. Bracing Angles shall be of the same metal as the duct. Angles shall be riveted to the ducts on 6" centers, and shall be applied on all four sides. On vertical ducts, set of bracing angles shall be located with heel down at the floor line wherever duct passes through floor. End of two opposite angles shall extend as required to catch floor construction.

E. Duct Turns: Long radius elbows shall be provided, except as indicated hereinafter:

1. Long Radius Elbows shall be constructed with a throat radius equal to not less than the dimension to the duct width in the plane of the duct turn. Where space does not permit the use of a long radius elbow, vaned mitered elbows shall be provided.

2. Mitered Elbows: All mitered elbows shall be constructed with factory- fabricated, turning vanes equal to Barber-Colman "Ducturns."

F. Flexible Connections: Furnish and install flexible connections between all fans and ducts or casings where required to prevent excessive movement of long ducts and wherever ducts cross building expansion joints. Material shall be fabricated with sewed seams. Connections shall be approximately 4" long and installed with sufficient slack to prevent transmission of vibration.

G. Duct Hangers:

1. Ducts up to and including 36" in width shall be hung by 1" x 1/8" flat straps bent under bottom of duct a minimum of 2" and securely fastened to duct.

2. Ducts larger than 36" in width shall be hung 3/8" steel rods and 2" x 2" x 1/4" angle trapeze hanger. Rods shall be supported by 2-1/2" x 2-1/2" x 1/4" minimum steel angles secured to two or more joist.

O. Joint Sealants:

1. Low Pressure Ductwork: Seal joints in accordance with SMACNA Low Pressure Duct Construction Standards, Seal Class B.

   a. Sealant: Resistant to gasoline, oil and water. Thermal range from minus 25 degrees F to plus 200 degrees F, flame spread rating of not more than 25 and smoke developed rating of not more than 50, withstand duct air pressure 25 percent in excess of leakage test pressure. Supplier of sealant shall certify that sealant has been successfully marketed and used for a period of three (3) years without change in formula.

   b. Tape: In conformance with Fed. Std. 147, polyethylene coated cloth backing with rubber resin adhesive, four inches wide, not less than 0.0125 inches thick, withstand minimum temperature of 180 degrees F, tensile strength not less than 35 pounds per inch width and water vapor transmission rate not over 1.2 grains per 100 square inches per 24 hours.

P. Duct Leakage Tests and Repair:

1. Low Pressure Ducts: Seal visible openings and seal air leaks audible at operating conditions.

END OF SECTION

SECTION 15950 - CONTROLS

PART 1: GENERAL

1.01 DESCRIPTION

A. General: The control system shall be electronic with equipment furnished, installed and guaranteed by Trane, Honeywell, Johnson, Powers or Barber Colman.

B. The Temperature Contractor shall provide and install a complete system of electric automatic temperature control as herein specified, including all required thermostats, valves, relays, switches, etc., as indicated and required.

1. Work includes, but is not limited to, the following:

   a. Thermostats

   b. Control Panels

   c. Wiring of Control Devices

   d. Control Devices

   e. Sequence of Operation

2. Work Related and Specified Elsewhere:

   a. Section 15050 - Basic Mechanical Materials and Methods

   b. Section 15500 - Heating, Ventilating and Air Conditioning

   c. Section 15550 - Heat Generation

   d. Section 15750 - Heat Transfer

   e. Section 15850 - Air Handling

1.02 SUBMITTALS

A. In accordance with Section 15050 - Basic Mechanical Materials and Methods, furnish the following:

1. Manufacturer's Literature and Data:

   a. All control items, valves, dampers, transformers, etc., associated with the systems.

   b. Complete control drawings showing all wiring, controls and written sequence of operation.

2. Manuals: All maintenance and operating equipment associated with controls.

PART 3: EXECUTION

3.01 WIRING

A. Under this section, provide and install all wiring associated with the temperature control system. Equipment and wiring not provided under electric sections shall be furnished and mounted under this section.

1. Low voltage wiring (24V) shall be No. 18 minimum and run in cable enclosure; Wiremold or approved equal.

2. Line voltage wiring (120V or higher) shall be No. 12 minimum and run in conduit.

3. All wiring shall be in accordance to Division 16 - Electrical.

3.02 DESCRIPTION OF OPERATION

A. Make Up Air Handler and Exhaust Fans EF-2 & 3. (Work Area)

1. Programmable Control Module (PCM) will function as the time clock, occupied/unoccupied control and functional control. The PCM will start up occupied cycle at a set time and start up exhaust fan EF-3 simultaneously. The PCM will control the MUA Unit Outside Air and Return Air Damper as a function of EF Operation. It will also have an override function.

2. Occupied - Outside air and return air dampers are positioned to allow 2260 CFM of outside air and 1200 CFM of return air (3460 CFM mixed air) to be delivered to the work area. Exhaust fan EF-3 shall run whenever the O.A. damper is open. EF-3 will exhaust from the work area. Temperature control shall be by a room thermostat set at 65 degrees F. When the grinding room exhaust fan (EF-2) is operating the O.A. damper shall go to full open (3460 CFM O.A.) and the return air damper shall close.

3. Unoccupied - The outside air damper shall be closed and the R.A. damper shall be open and 3460 CFM of R.A. shall be recirculated to maintain 60 degrees F night setback temperature. Both exhaust fans EF-3 (work area) and EF-2 (grinding room) shall be off.

B. Controls for Baseboard Radiation and Unit Heaters.

1. Boiler will be on, controlled by the operating controls due to domestic hot water considerations.

2. Radiation shall be controlled by a line voltage thermostat that will turn on the respective circulatory pump.

3. Unit heater shall be controlled by line voltage thermostats that will turn on the unit heater fans and the respective circulating pump.

C. Exhaust fans in the bathroom shall be controlled by the light switch.

SECTION 15990 - TESTING, ADJUSTING AND BALANCING

PART 1: GENERAL

1.01 WORK INCLUDED

A. Furnish all labor, materials, equipment, supplies, and perform all operations necessary to complete the testing, adjusting and balancing work in accordance with the drawings and these specifications.

B. Testing, adjusting and balancing (TAB) of heating, ventilating and air conditioning (HVAC) systems.

1.02 RELATED WORK

A. Section 15050 - Basic Mechanical Materials and Methods

B. Section 15500 - Heating, Ventilating and Air conditioning

1.03 SYSTEM DESCRIPTION

A. Definitions:

1. Basic TAB Terms Used in this Section: Chapter 40, "Testing, Adjusting, and Balancing" of ASHRAE Handbook, 1980 Systems Volume.

2. TAB - Testing, Adjusting and Balancing: The process of checking and adjusting HVAC systems to meet design objectives.

3. AABC: Associated Air Balance Council.

4. NEBB: National Environmental Balancing Bureau.

5. Hydronic Systems: Includes all supply and return piping for glycol, chilled water and hot water system.

6. Air Systems: Includes all supply air, and return air for variable volume air handling units, make-up air handling units, exhaust and supply air fans.

1.04 QUALITY ASSURANCE

A. Tab Agency Qualifications: Current membership in AABC, or certification by NEBB, or the TAB Agency shall submit proof to the satisfaction of the Owner that the Agency meets the certification requirements of AABC, NEBB or alternate acceptance criteria.

B. Performance Criteria: Work shall be performed in accordance with the approved TAB Agenda.

PART 3 EXECUTION

3.01 GENERAL

A. Coordinate TAB procedures with any phased construction requirements for the project so that usable increments of finished work may be accepted for beneficial occupancy. Systems serving partially occupied phases of the project may require balancing for each phase prior to final balancing.

B. Allow sufficient time in construction schedule for TAB prior to final inspection for the project.

C. Conduct final TAB after system has been completed and is in full working order. Put all HVAC systems into full operation and continue operating of the systems during each working day of TAB. Accomplish TAB in accordance with the Agenda approved by Owner.

3.02 OPERATING AND PERFORMANCE TESTS

A. Prior to the final inspection, perform required tests and submit the test reports and records.

B. Air System:

1. All controls should be checked out by the Control Contractor and be operating correctly prior to start-up of the system. Final set points and adjustments may be made during or after the balancing. All lubrication, electrical connections, air filters, etc., necessary for proper operation of the system shall be completed prior to start-up of the system.

2. Upon start-up of a system, check fan for the following and record readings as indicated.

a. Check fan drives for rotation and slippage and record fan rpm.

b. Measure and record voltage and actual amperage draw on each phase lec. Determine that motor is not overloaded.

c. Take all necessary airflow or pressure measurements to determine air quantities in ducts and outlets. Make all adjustments necessary to proportion the airflow correctly. Make final adjustments to fan drives to establish correct total airflow. Adjust outside air and return quantities for all systems to within plus or minus 10 percent.

d. Take final readings and record the following data:

1) Fan rpm, voltage, amperage draw on each phase leg, and calculated BHP.

2) CFM at all fans, outlets etc.

3) Outside air and return quantities.

e. Submit for approval all initial and final readings as specified. Compare measured readings to design quantities and not deviation.

C. Piping System:

SECTION 16000 - BASIC ELECTRICAL REQUIREMENTS

PART 1: GENERAL

1.01 WORK INCLUDED

A. In general, the work consists of connecting new equipment associated with the lighting and mechanical systems all as indicated on the drawings and specifications including the following:

1. Furnish and install wiring devices, equipment and connections for new lighting fixtures, receptacles, panelboards, and connect mechanical equipment, etc. Rewire and relocate grinders and air compressors from existing building.

2. Provide a new electrical service entrance and service to building.

3. Furnish all labor, materials, equipment, and supplies, and perform all operations necessary to complete the secondary grounding work in accordance with the drawings and these specifications.

4. Install telephone conduit to building from existing Main Building, wiring to telephone jacks, and telephone jacks.

1.02 QUALITY ASSURANCE

A. All wiring shall be in accordance with the latest issue of the National Electrical Code.

B. The service equipment shall be grounded at the service entrance switch enclosure. This shall also be the grounding point for the service conduit, boxes, fittings and metal enclosed equipment used in the building wiring system. Any grounding methods allowed under Article 250 of the National Electrical Code may be used provided the ground resistance is less than 25 ohms. This resistance shall be tested.

C. Ground Resistance Testing:

1. Measure ground resistance with bridge type meter designed for testing grounds.

2. Record readings, conditions of soil, model of meter, date, and name of tester.

3. Conduct test in presence of Owner or his Representative. The test shall be made no less than 48 hours after a rain.

D. The Contractor shall show evidence of having successfully completed at least five similar projects. Installation of each system shall be under the supervision of a factory-authorized organization.

E. The Contractor shall show evidence, upon request, that he maintains a fully equipped service organization capable of furnishing adequate inspection and service to the system. The Contractor must have a service contract program for the maintenance of the system after the guarantee period.

F. All electrical equipment shall be approved by Underwriters Laboratories, Inc. Each system shall be products of a single manufacturer of established reputation and experience. The Contractor shall have supplied similar apparatus to comparable installations rendering satisfactory service for at least three years.

1.06 PROJECT CONDITIONS

A. Regulatory Requirements: Secure and pay for all permits and certificates as required by local and state laws.

1.07 WARRANTY

A. The Contractor shall guarantee all equipment and wiring free from inherent mechanical or electrical defects for one year from date of acceptance.

1.08 RELATED WORK

A. Division 15 - Mechanical

PART 2: PRODUCTS

2.01 MATERIALS

A. Toggle Switches: 20A, 120/277V, 1-pole, brown (or as selected by Architect) specification grade, mount 4'-0" above finished floor at door entrance or as noted.

B. Receptacles shall be specification grade NEMA 5-20R or as indicated, mounted 24" above finished floor unless otherwise noted. Provide GFCI receptacles where indicated.

C. Plates shall be 302 stainless steel with tamper-proof screws.

D. Boxes shall be steel minimum 2-1/2" deep.

E. Light Fixtures: The light fixtures shall be as described on the drawings or other approved equal is also acceptable.

F. Disconnect Switches shall be horsepower rated.

G. Motor Starters:

1. Manual motor starters shall be toggle-switch type with melting alloy thermal overload relay. Thermal units shall be one-piece construction and interchangeable. Starter shall be inoperative with thermal unit removed. Contacts shall be double break, silver alloy. Starters in finished areas shall be flush mounted over the light switch at 60" above finished floor. Starters shall be mounted behind stainless steel device plate and shall have adjacent pilot lights. Square D Class 2510 Type FS-1P-FL1 or approved equal. Starters in unfinished areas shall be surface mounted 60" above finished floor. Square D Class 2510 Type FG-5P or approved equal. Furnish starter with pilot light to indicate motor is running.

I. Panelboards:

1. Provide standard manufacturer products. All components of panelboards shall be the product and assembly of the same manufacturer. All similar units of all panelboards shall be of the same manufacturer.

2. The panel shall be dead front safety type with service entrance label.

3. The panelboard shall be completely factory assembled with molded case circuit breakers.

4. The panel shall have main breaker or main lugs, bus size, voltage, phase, top or bottom feed, and flush or surface mounting all as scheduled on the drawings.

5. The panelboard shall have the following features:

a. Non-reduced size copper or aluminum bus bars and connection straps bolted together and rigidly supported on molded insulators. Bus bar taps shall be arranged for sequence phasing of branch circuit devices.

b. Full size neutral bar mounted on insulated supports.

c. Ground bar with sufficient terminals for all grounding wires. The ground bar shall be insulated and isolated where called for on the drawings.

d. Buses braced for the available short-circuit current, but not less than 22,000 amperes symmetrical. If the panelboard is within 25 feet of the service entrance, and never less than 10,000 amperes symmetrical.

e. All breakers arranged so that it will be possible to substitute a two-pole breaker for two single pole breakers or a three-pole breaker for three single pole breakers when frame size is 100 amperes or less.

f. Design interior so that protective devices can be replaced without removing adjacent units, main bus connectors and without drilling or tapping.

g. Where designated, on panel schedule as "space", include all necessary bussing, device supports and connections. Provide blank cover for each space.

h. Provide galvanized steel cabinets to house panelboards. Cabinets for panelboards may be factory primed and suitably treated with a corrosion-resisting paint finish meeting UL standard for outdoor applications.

i. Back and sides shall be of one-piece formed steel. Cabinets for panelboards may be of formed sheet steel with end and side panels welded, riveted or bolted as required.

j. Provide minimum of four interior mounted studs and necessary hardware for in and out adjustment of panel interior.

N. Equipment Grounding Connections: Connections shall be of the compression type solderless connectors.

O. Meter Socket: Provide Anchor or utility approved equal meter socket to receive the utility's meter.

P. Surge Arrester: 0-650 volt A.C. rating, single phase, 2 pole, G.E. Model No. 9L15ECB001, or equal.

PART 3: EXECUTION

3.01 INSTALLATION

A. General:

1. All work shall be in accordance with the National Electrical Code's requirements as amended to date, with the local electric utility company's rules, the Fire Underwriter's requirements, and all local, state and federal laws and regulations.

2. Conduits shall be of sizes required by the National Electrical Code. Exposed conduits shall be installed with runs parallel or perpendicular to walls and ceiling, with right-angle turns consisting of bends, fittings, or outlet boxes. No wire shall be installed until work which might cause damage to wires or conduits has been completed. Conduits shall be thoroughly cleaned of water or other foreign matter before wire is installed.

3. All splices shall be mechanically and electrically perfect, using crimp type wire connectors.

4. Provide all disconnect switches required by the N.E.C.

5. Locate motor starters as shown on drawings.

6. Mount disconnect switches and starters at a height of 60" above finished floor unless otherwise noted.

7. Provide all necessary hardware for mounting motor starters.

8. Locate panelboards so that the present and future conduits can be conveniently connected.

9. A typewritten schedule of circuits, approved by the Owner's Representative shall be on the panel directory cards. Type the room numbers and items served on the cards. Three-complete separate copies of all directories, neatly bound, shall be delivered to the Owner's Representative.

10. Mount the panelboard so that maximum height of circuit breakers above finished floor shall not exceed 78".

11. Circuit numbers indicated on the drawings are the actual numbers assigned to the circuit in the panelboard and shall not be varied without the consent of the Architect/Engineer.

12. Lighting Fixtures: Conduits shall not be used for grounding fixtures. Green equipment grounding conductor must be bonded to all fixtures.

C. Install secondary service as shown on the drawings, as directed, and in conformance with the utility's requirements.

D. Install the meter socket where shown on the drawings as detailed.

E. Site Conditions

1. The Contractor shall study all drawings and specifications and visit the site and acquaint himself with the existing conditions and the requirements of the plans and specifications. No claim will be recognized for extra compensation due to the failure of the Contractor to familiarize himself with the conditions and extent of the proposed work.

2. The Electrical Contractor shall execute all alterations, additions, removals, relocations or new work, etc., as indicated or required to provide a complete installation in accordance with the intent of the drawing and specifications.

d. When the systems have been completed and prior to the final inspection, furnish testing equipment and perform the following tests in the presence of the Owner's Representative.

1) Before energizing the cables and wires, check for correct connections and test for short circuits, ground faults, continuity, and insulation.

2) Test the insulation on all installed cable and wiring by standard methods as recommended by the equipment manufacturer.

G. Continuity of Services: The Electrical Contractor shall arrange to execute his work at such times and in such locations to provide uninterrupted service to the building or any of its sections. If necessary, temporary power shall be installed to provide for this condition. Authorization for interrupting service shall be obtained in writing from the Owner. Any interruption of normal supply shall be performed during an overtime period to be scheduled with the Owner. Cost for overtime work shall be included in the bid.

H. Identification: Provide tags on each end of all pulled wires giving location of other end. Provide phenolic nameplates for all panelboards, motor starters, and disconnect switches (except switches located at motors).

I. Record Drawings: The Contractor shall keep on the job a set of prints showing any changes to the installation. These shall be given to the Engineer at the completion of the work.

J. Testing and Adjusting:

1. The entire installation shall be free from short-circuits and improper grounds. Tests shall be made in the presence of the Engineer or his representatives.

2. Each individual circuit shall be tested at the panel; and in testing for insulation resistance to ground,