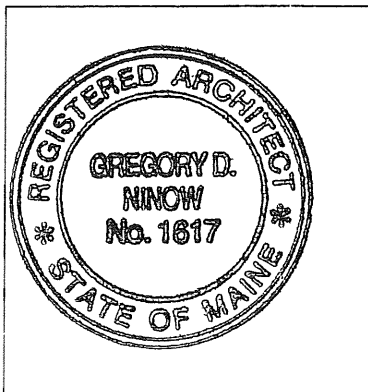


HARRIMAN ASSOCIATES



Shaw's
Supermarkets, Inc.

Northgate Retail
Conversions

Portland, Maine

Project No. 00128

November 10, 2000

RETAIL CONVERSIONS
Northgate Plaza
Portland, Maine

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SECTION 00200

INFORMATION AVAILABLE TO BIDDERS

PART 1 - GENERAL

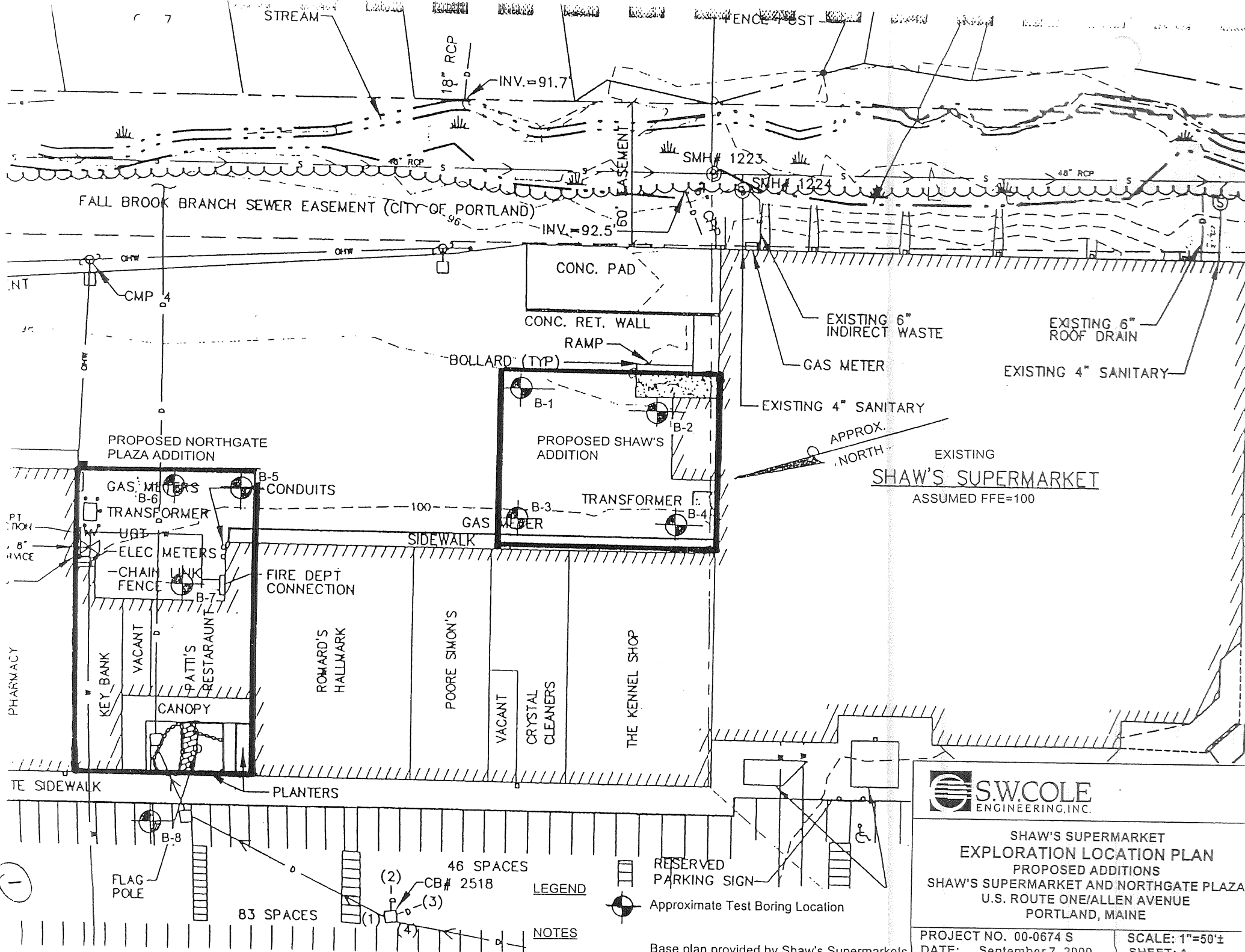
1.01 INFORMATION FOR BIDDERS

- A. The information being provided is for the bidder's convenience and does not relieve the bidders from doing their own investigation to determine the accuracy of the information.

1.02 GEOTECHNICAL REPORT

- A. Explorations and Geotechnical Engineering Services, by S.W. Cole engineering.

END OF SECTION



SHAW'S SUPERMARKET
 EXPLORATION LOCATION PLAN
 PROPOSED ADDITIONS
 SHAW'S SUPERMARKET AND NORTHGATE PLAZA
 U.S. ROUTE ONE/ALLEN AVENUE
 PORTLAND, MAINE

PROJECT NO. 00-0674 S SCALE: 1"=50'±
 DATE: September 7, 2000 SHEET: 1

LEGEND

- RESERVED PARKING SIGN
- Approximate Test Boring Location

NOTES

Base plan provided by Shaw's Supermarkets

46 SPACES CB# 2518
 83 SPACES

FLAG POLE

S.W. COLE

ENGINEERING, INC.
GEO TECHNICAL CONSULTANTS

BORING LOG

BORING NO.: B-2

SHEET: 1 OF 1

PROJECT / CLIENT: PROP. SHAW'S NORTHGATE PLAZA EXPANSION / SHAW'S SUPERMARKET, INC.

PROJECT NO.: 00-0674

LOCATION: NORTHGATE PLAZA / ROUTE 100 / PORTLAND, MAINE

DATE START: 8/10/00

DRILLING FIRM: GREAT WORKS TEST BORINGS INC. DRILLER: DON BOLSTRETCH

DATE FINISH: 8/10/00

ELEVATION: 98±

SWC REP.: MTT

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HW	4"	300 lb	30"
SAMPLER:	S.S.	1 3/8"	140 lb	30"
CORE BARREL:	NQ2			

WATER LEVEL INFORMATION

CASING BLOWS PER FOOT	SAMPLE NO.			DEPTH @ BOT	SAMPLER BLOWS PER 6"				DEPTH	STRATA & TEST DATA
	NO.	PEN.	REC.		0-6	6-12	12-18	18-24		
									0.4'	PAVEMENT
	1D	24"	12"	2.4'	8	7	22	24	2.0'	BROWN SAND WITH SOME GRAVEL AND TRACE SILT (FILL) -MEDIUM DENSE- -HARD- BROWN SILTY CLAY $q_p = 9.0$ KSF $w = 25.5\%$
	2D	24"	23"	7.0'	9	12	16	20	7.5'	
	3D	10"	6"	8.9'	32	50/4"				GRAYISH-BROWN CLAYEY SILTY SAND AND GRAVEL -MEDIUM DENSE TO DENSE-
	4D	24"	14"	12.0'	14	24	20	17	13.0'	-DENSE- GRAY SAND WITH SOME GRAVEL AND TRACE SILT
									15.0'	ROLLER CONED FROM 13.0 TO 15.0' (NO SAMPLING) ATTEMPTED TO CORE 15.0' TO 19.0' (NO SAMPLING) PROBABLE GRANULAR SOILS WITH COBBLES
	R1	48"	6"	19.0'					19.0'	
										BOTTOM OF EXPLORATION @ 19.0'

SAMPLES:

SOIL CLASSIFIED BY:

REMARKS:

D=SPLIT SPOON
C=3" SHELBY TUBE
U=3.5" SHELBY TUBE

<input type="checkbox"/>	DRILLER - VISUALLY
<input checked="" type="checkbox"/>	SOIL TECH.-VISUALLY
<input checked="" type="checkbox"/>	LABORATORY TEST

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

S.W. COLE

ENGINEERING, INC.
GEOTECHNICAL CONSULTANTS

BORING LOG

BORING NO.: B-3

SHEET: 1 OF 1

PROJECT / CLIENT: PROP. SHAW'S NORTHGATE PLAZA EXPANSION / SHAW'S SUPERMARKET, INC.

PROJECT NO.: 00-0674

LOCATION: NORTHGATE PLAZA / ROUTE 100 / PORTLAND, MAINE

DATE START: 8/10/2000

DATE FINISH: 8/10/2000

DRILLING FIRM: GREAT WORKS TEST BORINGS INC. DRILLER: DON BOLSTRETCH

ELEVATION: 100±

SWC REP.: MTT

CASING: TYPE H.S.A. SIZE I.D. 1 3/8" HAMMER WT. 140 lb HAMMER FALL 30"

SAMPLER: S.S. 1 3/8" 140 lb 30"

WATER LEVEL INFORMATION

NO FREE WATER OBSERVED

CORE BARREL:

CASING BLOWS PER FOOT	SAMPLE				SAMPLER BLOWS PER 6"				DEPTH	STRATA & TEST DATA
	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24		
									0.4'	PAVEMENT
	1D	24"	16"	2.4'	15	14	8	10	1.0'	BROWN GRAVELLY SAND WITH SOME SILT (FILL) ~MEDIUM DENSE
									4.0'	BROWN SILTY CLAY WITH SOME SAND ~MEDIUM DENSE ~HARD BECOMING... GRAYISH-BROWN SILTY CLAY q _p = 7.0 - 9.0 ksf
	2D	24"	24"	7.0'	5	9	13	16		
	3D	24"	22"	10.0'	6	8	8	8	11.5'	...VERY STIFF~ q _p = 4.0 - 8.0 ksf
									12.5'	APPEARS TO BE GRANULAR MATERIAL (NOT SAMPLED) AUGER REFUSAL @ 12.5'

SAMPLES:

SOIL CLASSIFIED BY:

REMARKS:

D=SPLIT SPOON
C=3" SHELBY TUBE
U=3.5" SHELBY TUBE

<input type="checkbox"/>
<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>

DRILLER - VISUALLY
SOIL TECH. VISUALLY
LABORATORY TEST

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

5

BORING NO.: B-3

S.W. COLE

ENGINEERING, INC.
GEOTECHNICAL CONSULTANTS

BORING LOG

BORING NO.: B-4

SHEET: 1 OF 1

PROJECT NO.: 00-0674

DATE START: 8/10/2000

DATE FINISH: 8/10/2000

ELEVATION: 100±

SWC REP.: MTT

WATER LEVEL INFORMATION

NO FREE WATER OBSERVED

PROJECT / CLIENT: PROP. SHAW'S NORTHGATE PLAZA EXPANSION / SHAW'S SUPERMARKET, INC.

LOCATION: NORTHGATE PLAZA / ROUTE 100 / PORTLAND, MAINE

DRILLING FIRM: GREAT WORKS TEST BORINGS INC. DRILLER: DON BOLSTRETCH

CASING: TYPE H.S.A. SIZE I.D. 1 3/8" HAMMER WT. 140 lb HAMMER FALL 30"

SAMPLER: S.S.

CORE BARREL:

CASING BLOWS PER FOOT	SAMPLE			SAMPLER BLOWS PER 6"				DEPTH	STRATA & TEST DATA	
	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18			18-24
	1D	24"	12"	2.4'	9	7	5	4	0.4'	PAVEMENT
									3.0'	BROWN GRAVELLY SAND WITH TRACE SILT (FILL) -MEDIUM DENSE- w=3.2% -HARD...
	2D	24"	20"	7.0'	7	12	16	19		w=26.2% BROWN SILTY CLAY q _p = >9.0 ksf
	3D	24"	24"	10.0'	9	10	12	16		q _p = 7.0 ksf
									12.5'	...VERY STIFF-
										AUGER REFUSAL @ 12.5'

SAMPLES:

SOIL CLASSIFIED BY:

REMARKS:

D=SPLIT SPOON
C=3" SHELBY TUBE
U=3.5" SHELBY TUBE

<input type="checkbox"/>
<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>

DRILLER - VISUALLY
SOIL TECH. VISUALLY
LABORATORY TEST

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

6

BORING NO.: B-4

S.W. COLE

ENGINEERING, INC.
GEOTECHNICAL CONSULTANTS

BORING LOG

BORING NO.: B-5

SHEET: 1 OF 1

PROJECT NO.: 00-0674

DATE START: 8/10/2000

DATE FINISH: 8/10/2000

ELEVATION: 100±

SWC REP.: MTT

WATER LEVEL INFORMATION

NO FREE WATER OBSERVED

SOIL SATURATED BELOW 12'±

PROJECT / CLIENT: PROP. SHAW'S NORTHGATE PLAZA EXPANSION / SHAW'S SUPERMARKET, INC.

LOCATION: NORTHGATE PLAZA / ROUTE 100 / PORTLAND, MAINE

DRILLING FIRM: GREAT WORKS TEST BORINGS INC. DRILLER: DON BOLSTRETCH

CASING:	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
	H.S.A.			
SAMPLER:	S.S.	1 3/8"	140 lb	30"
CORE BARREL:				

CASING BLOWS PER FOOT	SAMPLE				SAMPLER BLOWS PER 6"				DEPTH	STRATA & TEST DATA
	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24		
									0.4'	PAVEMENT
	1D	24"	12"	2.4'	16	35	15	8	1.0'	GRAYISH-BROWN SILTY CLAY (FILL) ~DENSE-
									3.0'	BROWN SILTY SAND ~MEDIUM DENSE- ~HARD BECOMING... w=25.9%
	2D	24"	10"	7.0'	5	8	12	18		BROWN SILTY CLAY q _p = >9.0 ksf
	3D	24"	24"	10.0'	8	12	14	16	12.0'	w=26.3% ...VERY STIFF- ~MEDIUM- q _p = 7 ksf
	4D	24"	12"	17.0'	2	1	1	2	17.0'	GRAY SILTY CLAY WITH TRACE GRAVEL AND SAND w=36.3% q _p = <1.0 ksf
										BOTTOM OF EXPLORATION @ 17.0'

SAMPLES:

SOIL CLASSIFIED BY:

REMARKS:

D=SPLIT SPOON
C=3" SHELBY TUBE
U=3.5" SHELBY TUBE

<input type="checkbox"/>	DRILLER - VISUALLY
<input checked="" type="checkbox"/>	SOIL TECH.-VISUALLY
<input checked="" type="checkbox"/>	LABORATORY TEST

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

7

BORING NO.: B-5

S.W. COLE

ENGINEERING, INC.
GEOTECHNICAL CONSULTANTS

BORING LOG

BORING NO.: B-7
 SHEET: 1 OF 1
 PROJECT NO.: 00-0674
 DATE START: 8/10/2000
 DATE FINISH: 8/10/2000
 ELEVATION: 100±
 SWC REP.: MTT

PROJECT / CLIENT: PROP. SHAW'S NORTHGATE PLAZA EXPANSION / SHAW'S SUPERMARKET, INC.
 LOCATION: NORTHGATE PLAZA / ROUTE 100 / PORTLAND, MAINE
 DRILLING FIRM: GREAT WORKS TEST BORINGS INC. DRILLER: DON BOLSTRETCH

CASING: TYPE H. S. A. SIZE I.D. 1 3/8" HAMMER WT. 140 lb HAMMER FALL 30"
 SAMPLER: S.S.
 CORE BARREL:

WATER LEVEL INFORMATION
NO FREE WATER OBSERVED

CASING BLOWS PER FOOT	SAMPLE				SAMPLER BLOWS PER 6"				DEPTH	STRATA & TEST DATA	
	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24			
									0.4'	PAVEMENT	
1D	24"	12"	2.4'		8	18	16	10	3.0'	-MEDIUM DENSE- BROWN GRAVEL AND SAND WITH SOME SILT (FILL) w=6.0 %	
									8.0'	-VERY STIFF- BROWN SILTY CLAY WITH SOME SAND q _p = 5.0 ksf	
2D	24"	24"	7.0'		6	6	9	15	8.0'	q _p = 4.0 ksf	
									13.0'	-HARD- GRAYISH-BROWN SILTY CLAY w=23.5% q _p = >9.0 ksf	
3D	24"	20"	10.0'		11	13	16	18	13.0'		
									19.0'	-MEDIUM- w=31.4% GRAY SILTY CLAY q _p = <1.0 ksf	
4D	24"	24"	17.0'		1	1	1	2	19.0'		
5D	24"	24"	19.0'		2	2	2	3	19.0'		
WOM	PROBE ROD 19' TO 26'				(NO SAMPLING)						
HYDRO											
PUSH											
▼									24.0'	PROBABLE GRAY SILTY CLAY	
40											
67									26.0'	PROBABLE GRANULAR SOILS	
										PROBE REFUSAL @ 26.0'	

SAMPLES: D=SPLIT SPOON
 C=3" SHELBY TUBE
 U=3.5" SHELBY TUBE

SOIL CLASSIFIED BY:
 DRILLER - VISUALLY
 SOIL TECH.-VISUALLY
 LABORATORY TEST

REMARKS: STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

S.W. COLE

ENGINEERING, INC.
GEOTECHNICAL CONSULTANTS

BORING LOG

PROJECT / CLIENT: PROP. SHAW'S NORTHGATE PLAZA EXPANSION / SHAW'S SUPERMARKET, INC.
LOCATION: NORTHGATE PLAZA / ROUTE 100 / PORTLAND, MAINE
DRILLING FIRM: GREAT WORKS TEST BORINGS INC. DRILLER: DON BOLSTRETCH

BORING NO.: B-8
SHEET: 1 OF 1
PROJECT NO.: 00-0674
DATE START: 8/10/2000
DATE FINISH: 8/10/2000
ELEVATION: 100±
SWC REP.: MTT

CASING: TYPE H. S. A. SIZE I.D. 1 3/8" HAMMER WT. 140 lb HAMMER FALL 30"
SAMPLER: S.S.
CORE BARREL:

WATER LEVEL INFORMATION
NO FREE WATER OBSERVED

CASING BLOWS PER FOOT	SAMPLE				SAMPLER BLOWS PER 6"				DEPTH	STRATA & TEST DATA
	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24		
									0.4'	PAVEMENT
1D	24"	12"	2.4'	14	9	5	6	1.0'	BROWN GRAVELLY SAND WITH TRACE SILT (FILL) -MEDIUM DENSE- -VERY STIFF- $q_p = 6.0$ ksf	
2D	24"	24"	7.0'	5	5	8	11	8.0'	GRAYISH-BROWN SILT CLAY WITH FINE SAND LAYERS $q_p = 5.5$ ksf	
3D	24"	24"	10.0'	14	15	19	20	13.0'	-HARD- GRAYISH-BROWN SILTY CLAY $q_p = >9.0$ ksf	
4D	24"	22"	17.0'	10	5	12	30	17.0'	GRAY CLAYEY SILTY SAND WITH SOME GRAVEL -MEDIUM DENSE- BOTTOM OF EXPLORATION @ 17.0'	

SAMPLES:

SOIL CLASSIFIED BY:

REMARKS:

D=SPLIT SPOON
C=3" SHELBY TUBE
U=3.5" SHELBY TUBE

<input type="checkbox"/>
<input checked="" type="checkbox"/>
<input type="checkbox"/>

DRILLER - VISUALLY
SOIL TECH.-VISUALLY
LABORATORY TEST

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

10-

BORING NO.: B-8

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.
γ _T	-	total soil weight
γ _B	-	buoyant soil weight

Description of Proportions:

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

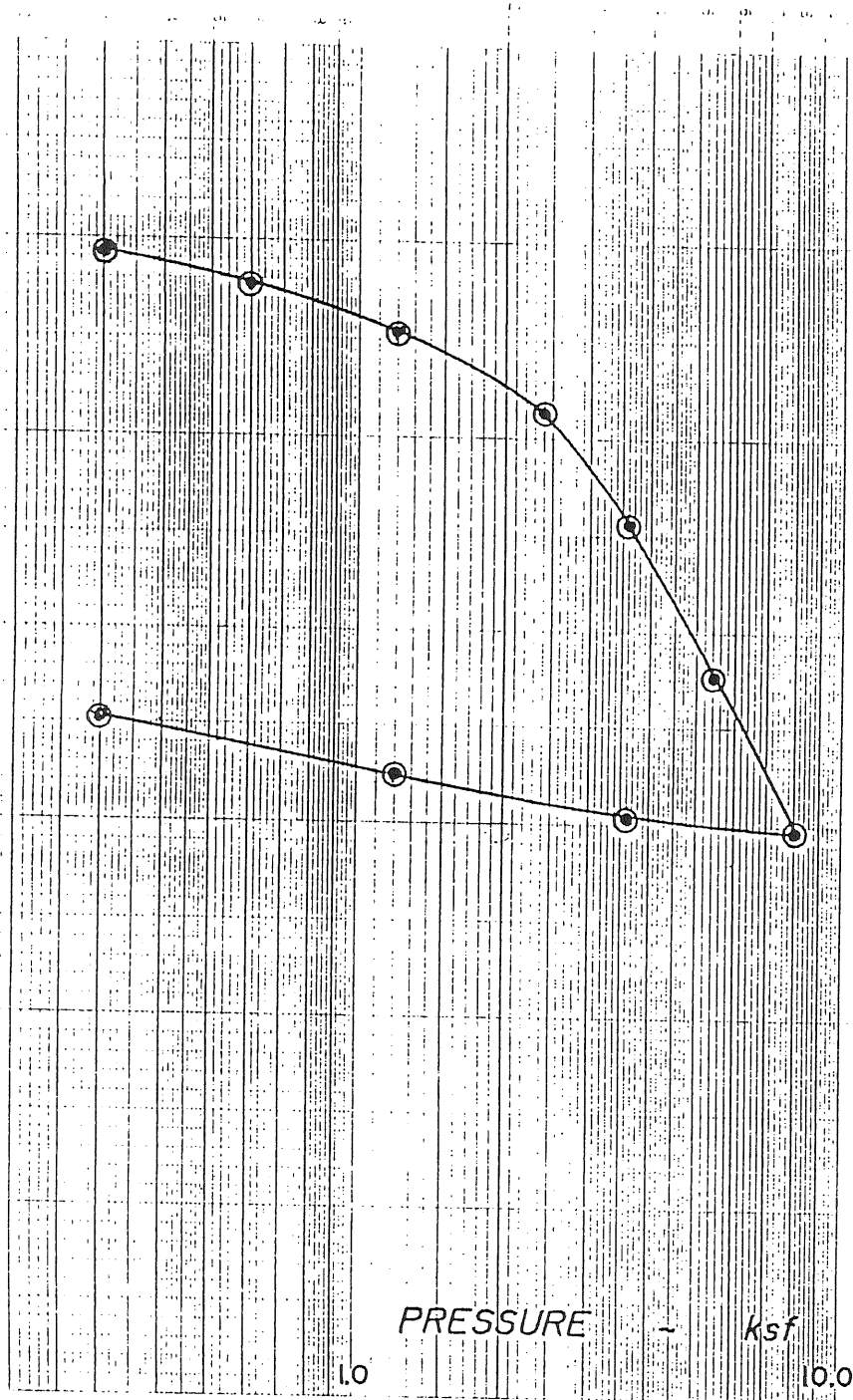
REFUSAL: Test Boring Explorations - Refusal depth indicates that depth at which, in the drill foreman's opinion, sufficient resistance to the advance of the casing, auger, probe rod or sampler was encountered to render further advance impossible or impracticable by the procedures and equipment being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

0.80
0.70
0.60
0.50

VOID RATIO *e*



PRESSURE ~ ksf
10.0

B-6, 1U

$P_c = 2.8 \pm$ ksf
 $C_c = 0.22$
 $C_r = 0.02$
 $W = 31.1\%$
 $W_L = 31.0$
 $W_p = 20.0$



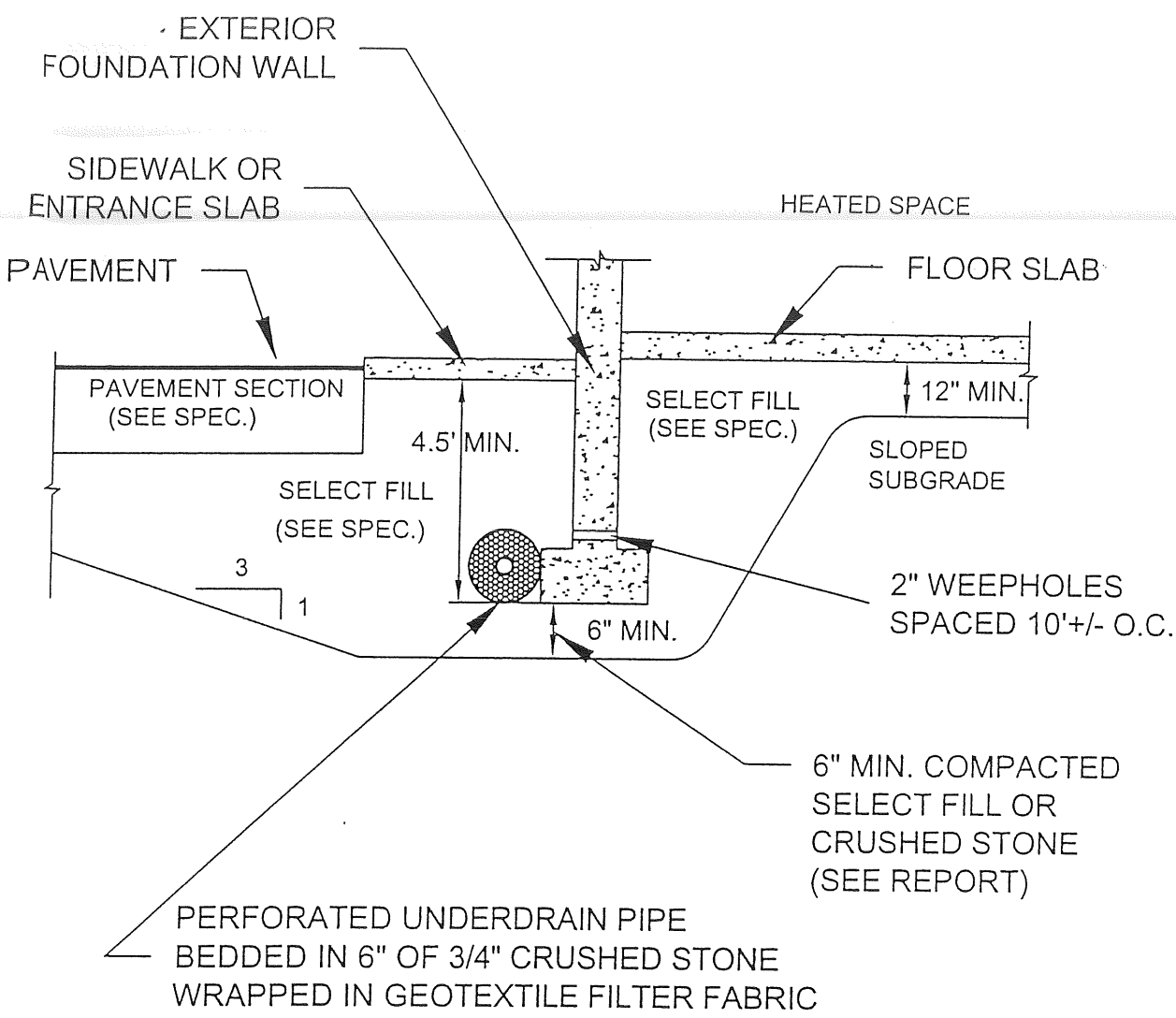
SHAW'S SUPERMARKETS, INC.

CONSOLIDATION TEST

Proposed Shaw's and Northgate Plaza Additions
 U.S. Route 100
 Portland, Maine

Job No. 00-0674 S
 Date: 09/08/00

Scale As Shown
 Sheet 13



NOTES :

- 1.) UNDERDRAIN INSTALLATION REQUIREMENTS AND SELECT FILL SPECIFICATIONS ARE CONTAINED WITHIN THIS REPORT.



SHAW'S SUPERMARKETS, INC.

UNDERDRAIN DETAIL

Proposed Shaw's and Northgate Plaza Additions
 U.S. Route 100
 Portland, Maine

Job No. 00-0674 S
 Date : 08/25/00

Scale Not to Scale
 Sheet 14

00-0674 UD.dwg
 8/25/00 1:21 PM
 Cole Engineering

SECTION 00600

CORPORATE RESOLUTIONS AND CERTIFICATES

1.01 CORPORATE RESOLUTION

- A. The Contractor shall furnish the "CORPORATE RESOLUTION," Exhibit "A" (refer to Table of Contents) to the Owner prior to executing any work or ordering any equipment. The "CORPORATE RESOLUTION" shall be signed by the corporate officer and shall authorize a person to serve as the Contractor's agent during the entire project.

1.02 CERTIFICATE OF INSURANCE

- A. At least three calendar days before commencing work the Contractor shall submit to Shaw's for approval the "CERTIFICATE OF INSURANCE," with limits of liability clearly indicated and in agreement with the Supplementary Conditions along with "CONTRACTOR'S INDEMNIFICATION AGREEMENT," Exhibit "B," signed by an officer or authorized representative of the Company and notarized. A copy shall be forwarded to the Architect.
- B. All policies of insurance provided for this project shall be kept and maintained by the Contractor for the entire time he is working on the project. The policies shall not be canceled without at least thirty days prior written notice to Shaw's and the Architect.

END OF SECTION

"EXHIBIT A"

CORPORATE RESOLUTION

Date _____

On the _____ of _____, 19____, due notice having been given, a special meeting of the Board of Directors of the _____ was held.
Full Name of Company

All Directors being present and voting, the following resolution was made, seconded and adopted:

That _____ in his capacity as _____
(Name) (Title)

of _____ is fully authorized to execute and sign, on behalf of
(Full Name of Company)

_____ all Bonds and contract Documents including
(Full Name of Company)

requisitions, change orders, etc. in connection with _____
(Name and Address of Project)

and to affix the corporate seal on such documents, and his signature shall be legal and binding upon the corporation.

ATTEST: _____
Secretary or Clerk (Seal)

STATE OF _____)

COUNTY OF _____)

ss. _____, 19____
(date)

Personally appeared _____, Secretary or Clerk of _____

Signer and sealer of the foregoing instrument, who, being duly authorized, acknowledged the same to be his/her free act and deed and the free act and deed of said _____, before me.

Notary Public

My Commission expires _____
(Seal)

"EXHIBIT B"
CONTRACTORS INDEMNIFICATION AGREEMENT

- I. Contractor hereby agrees to and shall at all times defend, indemnify and hold Owner and its officers, agents and employees wholly harmless from any and all losses, costs, expenses (including court costs and attorneys' fees, interests and profits), claims, demands, suits by any person or persons, injuries, damages or death and other liabilities of whatsoever kind or nature arising out of or resulting from the performance of the work, caused by, incident to, connected with or arising out of or resulting from the performance of this agreement and/or the work by the Contractor, any Subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable or any of their agents, representatives or employees. This Indemnity shall survive the termination of this agreement.
- II. Contractors indemnification obligation covers all acts arising out but not limited to the following:
- (A) Any infringement (actual or claimed) of any industrial property right, whether it be trade secret, patent, trademark, copyright or trade name by reason of any work to be performed hereunder or by any reason of anything to be supplied hereunder,
 - (B) Bodily injury, sickness, disease or death, or to injury to or destruction of tangible property including the loss of use resulting therefrom;
 - (1) caused by, incident to, connected with, or arising directly or indirectly out of performance of this agreement and/or the work;
 - (2) arising directly or indirectly out of the presence in, on, or about any part of the project site or the streets, sidewalks and property adjacent thereto or;
 - (3) arising directly or indirectly out of use, misuse or failure of any machinery or equipment (including, but not limited to, scaffolding, ladders, hoists, rigging, supports, etc.) whether or not such machinery or equipment was furnished, rented, or loaned by the Owner, any subcontractor, or any of their officers, employees, agents, servants, or others;
 - (C) Failure of Contractor or any subcontractor in any way to comply with the requirements of the Fair Labor Standards Act, as amended, and all applicable federal, state or local statutes, laws, ordinances, rules, regulations (including but not limited to the Occupational Safety and Health Act of 1970) or orders or any term or provision of this agreement (with all of which Subcontractor agrees to fully comply).
- III. In any and all claims against the Owner, any Subcontractor, their officers, agents or employees by any employee of the Contractor, any subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, the indemnification obligation under this agreement shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the contractor or any Subcontractor under Workmen's Compensation acts, disability benefits acts or other employee benefits acts.

THE PARTIES HAVE EXECUTED THIS AGREEMENT UNDER SEAL AS OF:

This _____ day of _____ 19_____.

Witness

Name of Company

Witness

Authorized Signature

"EXHIBIT C"

WAIVER OF LIEN – MATERIAL, EQUIPMENT AND LABOR

DATE _____

WHEREAS, the undersigned _____ has been employed by _____ to perform services in connection with a project located at _____.

NOW, THEREFORE, for and in consideration of the sum of _____ (\$ _____) the receipt whereof is hereby acknowledged, the undersigned does hereby irrevocably waive and release any lien of claim or right to lien, the labor, equipment, material, or all furnished against the premises owned by _____ located at _____ and against any funds remaining in the hand of the Owner, Lender or _____ for the purpose of construction of said premises.

The undersigned certifies and agrees that the work for which this payment is made has been completed and that all charges for labor, material, services and charges of every other nature in connection with this contract have been paid in full with the exception of the following:

The undersigned also certifies that he has complied with Federal, State, and local tax laws including Social Security Laws, Unemployment Compensation Laws, Worker's Compensation Laws, and payment of all Sales Taxes insofar as applicable to this work.

Signed by the undersigned (if a corporation, by its duly authorized officer) this _____ day of _____, 19____.

Contractor

By: _____
Title: _____

State Of _____
County Of _____

Sworn to and subscribed before me
This _____ day of _____
My Commission Expires _____
Given under my hand and notarial seal
The _____ day of _____, 19____.

NOTARY PUBLIC

(Seal)

"EXHIBIT D"

Form to Be Used by Subcontractor

FINAL WAIVER OF LIENS AND INDEMNITY AGREEMENT

KNOW ALL MEN BY THESE PRESENTS THAT _____ (hereinafter referred to as "Subcontractor") has rendered services, performed work and/or furnished materials for _____ (hereinafter referred to as "Contractor") in connection with the construction of a certain facility owned by _____ (hereinafter referred to as the "Owner") and situated on _____.

NOW THEREFORE, for one dollar (\$1.00) and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, Subcontractor does hereby, upon receipt of _____ Dollars and ____/100 (\$ _____) which represents the aggregate final payment due and payable by Contractor to Subcontractor for services rendered, work performed and/or materials furnished in connection with construction of the aforesaid facility, waive and release all liens and/or rights of lien which Subcontractor has or may have pursuant to the laws of the State of _____ by virtue of services rendered, work performed and/or materials furnished in connection with the construction of the aforesaid facility, it being specifically acknowledged and agreed by Subcontractor that, upon the receipt of the aforesaid aggregate final payment due for services rendered, work performed and/or materials furnished in connection with the construction of the aforesaid facility, Contractor shall have fully performed and/or fulfilled all obligations of Contractor to Subcontractor set forth in and required pursuant to any Subcontract Agreement between Contractor and Subcontractor with respect to the construction of the aforesaid facility.

Further, Subcontractor does hereby agree to indemnify Contractor and/or Owner by reason of any loss or damage which Contractor and/or Owner may sustain as a result of any mechanic's liens arising out of services rendered, work performed and/or materials furnished by Subcontractor or by any of the subcontractors, laborers or materialmen of Subcontractor.

IN WITNESS WHEREOF Subcontractor has executed this Final Waiver of Liens and Indemnity Agreement under seal this _____ day of _____, 19__.

(Subcontractor)

By: _____

Its _____ (designate office*)
Hereunto duly authorized

STATE OF _____

County of _____, 19__

Then personally appeared the above-named _____

(designate office*)

of Subcontractor and acknowledged the foregoing instrument to be the free act and deed of Subcontractor, before me,

Notary Public

My commission expires:

*This form is to be executed by the President or Vice President of Subcontractor if Subcontractor is a corporation, by a partner of Subcontractor if Subcontractor is a partnership or by the owner of Subcontractor if Subcontractor is a sole proprietorship.

FINAL WAIVER OF LIENS AND INDEMNITY AGREEMENT

KNOW ALL MEN BY THESE PRESENTS THAT _____
(hereinafter referred to as "Contractor") has rendered services, performed work and/or furnished materials
for _____ (hereinafter referred to as "Owner") in connection with the
construction of a facility known as _____ situated on _____
_____ in _____.

NOW THEREFORE, for one dollar (\$1.00) and other good and valuable consideration, the receipt and
sufficiency of which is hereby acknowledged, Contractor does hereby, upon receipt of _____
_____ Dollars and 00/100 (\$_____) representing the final
amount due and payable by Owner to Contractor, waive and release any and all liens and/or rights of lien
which Contractor has pursuant to the laws of the State of Massachusetts by virtue of services rendered,
work performed and/or materials furnished in connection with the construction of the aforesaid facility.

Contractor does hereby agree to indemnify Owner by reason of any loss or damage which Owner may
sustain as a result of any mechanic's liens arising out of services rendered, work performed and/or
materials furnished by any party retained by, through or under Contractor in connection with the
construction of the aforesaid facility.

This Final Waiver of Liens and Indemnity Agreement shall be binding upon Contractor and the successors
and assigns of Contractor and shall inure to the benefit of Owner and the successors and assigns of Owner.

IN WITNESS WHEREOF, Contractor has executed this Final Waiver of Liens and Indemnity Agreement
under seal this _____ day of _____, 19____.

By _____
Its President
Hereunto duly authorized

STATE OF _____
County of _____

Then personally appeared the above-named _____,

of Contractor and acknowledged the foregoing instrument to be the free act and deed of Contractor,
before me,

Notary Public
My commission expires: _____



shaw's

SHAW'S SUPERMARKETS, INC.
PO BOX 600 - E. BRIDGEWATER, MA 02333
(508) 373-7211

REMOELS / NEW STORE OPENINGS

"EXHIBIT F"

LOCK-OUT / TAG-OUT REQUIREMENTS

Attached is a copy of O.S.H.A.'s Lock-Out / Tag-Out regulation. Shaw's Supermarkets will expect all service / construction personnel to observe these regulations while working at our facilities. You must provide and utilize your own tags or locks even if Shaw's has already disabled the equipment. Once you have repaired the equipment you will remove only your lock or tag. Any Shaw's tags will be removed by store management only. Failure to observe Lock-Out / Tag-Out procedures will make you liable to O.S.H.A. and will lead to a review of Shaw's future use of your services.

APPENDIX E TO § 1910.146—SEWER SYSTEM
ENTRY

Sewer entry differs in three vital respects from other permit entries; first, there rarely exists any way to completely isolate the space (a section of a continuous system) to be entered; second, because isolation is not complete, the atmosphere may suddenly and unpredictably become lethally hazardous (toxic, flammable or explosive) from causes beyond the control of the entrant or employer, and third, experienced sewer workers are especially knowledgeable in entry and work in their permit spaces because of their frequent entries. Unlike other employments where permit space entry is a rare and exceptional event, sewer workers' usual work environment is a permit space.

(1) *Adherence to procedure.* The employer should designate as entrants only employees who are thoroughly trained in the employer's sewer entry procedures and who demonstrate that they follow these entry procedures exactly as prescribed when performing sewer entries.

(2) *Atmospheric monitoring.* Entrants should be trained in the use of, and be equipped with, atmospheric monitoring equipment which sounds an audible alarm, in addition to its visual readout, whenever one of the following conditions is encountered: Oxygen concentration less than 19.5 percent; flammable gas or vapor at 10 percent or more of the lower flammable limit (LFL); or hydrogen sulfide or carbon monoxide at or above 10 ppm or 35 ppm, respectively, measured as an 8 hour time-weighted average. Atmospheric monitoring equipment needs to be calibrated according to the manufacturer's instructions. Substance specific monitoring equipment should be used whenever actual or potential contaminants have been identified. The instrument should be carried and used by the entrant in sewer line work to monitor the atmosphere in the entrant's environment, and in advance of the entrant's direction of movement, to warn the entrant of any deterioration in atmospheric conditions. When several entrants are working together in the same immediate location, one instrument, used by the lead entrant, is acceptable.

(3) *Surge flow and flooding.* Sewer crews should develop and maintain liaison, to the extent possible, with the local weather bureau and fire and emergency services in their area so that sewer work may be delayed or interrupted and entrants withdrawn whenever sewer lines might be suddenly flooded by rain or fire suppression activities, or whenever flammable or other hazardous materials are released into sewers during emergencies by industrial or transportation accidents.

(4) *Special Equipment.* Entry into large bore sewers may require the use of special

equipment. Such equipment might include such items as atmosphere monitoring devices with automatic audible alarms, escape self-contained breathing apparatus (ESCSBA) with at least 10 minute air supply (or other NIOSH approved self-rescuer), and waterproof flashlights, and may also include boats and rafts, radios and rope stand-offs for pulling around bends and corners as needed.

[58 FR 4549, Jan. 14, 1993; 58 FR 34845, June 29, 1993]

§ 1910.147 The control of hazardous energy (lockout/tagout).

(a) *Scope, application and purpose—*

(1) *Scope.* (i) This standard covers the servicing and maintenance of machines and equipment in which the *unexpected* energization or start up of the machines or equipment, or release of stored energy could cause injury to employees. This standard establishes minimum performance requirements for the control of such hazardous energy.

(ii) This standard does not cover the following:

(A) Construction, agriculture and maritime employment;

(B) Installations under the exclusive control of electric utilities for the purpose of power generation, transmission and distribution, including related equipment for communication or metering; and

(C) Exposure to electrical hazards from work on, near, or with conductors or equipment in electric utilization installations, which is covered by subpart S of this part; and

(D) Oil and gas well drilling and servicing.

(2) *Application.* (i) This standard applies to the control of energy during servicing and/or maintenance of machines and equipment.

(ii) Normal production operations are not covered by this standard (See subpart O of this part). Servicing and/or maintenance which takes place during normal production operations is covered by this standard only if:

(A) An employee is required to remove or bypass a guard or other safety device; or

(B) An employee is required to place any part of his or her body into an area on a machine or piece of equipment where work is actually per-

formed upon the material being processed (point of operation) or where an associated danger zone exists during a machine operating cycle.

NOTE Exception to paragraph (a)(2)(ii): Minor tool changes and adjustments, and other minor servicing activities, which take place during normal production operations, are not covered by this standard if they are routine, repetitive, and integral to the use of the equipment for production, provided that the work is performed using alternative measures which provide effective protection (See subpart O of this part).

(iii) This standard does not apply to the following.

(A) Work on cord and plug connected electric equipment for which exposure to the hazards of unexpected energization or start up of the equipment is controlled by the unplugging of the equipment from the energy source and by the plug being under the exclusive control of the employee performing the servicing or maintenance.

(B) Hot tap operations involving transmission and distribution systems for substances such as gas, steam, water or petroleum products when they are performed on pressurized pipelines, provided that the employer demonstrates that (1) continuity of service is essential; (2) shutdown of the system is impractical; and (3) documented procedures are followed, and special equipment is used which will provide proven effective protection for employees.

(3) *Purpose.* (i) This section requires employers to establish a program and utilize procedures for affixing appropriate lockout devices or tagout devices to energy isolating devices, and to otherwise disable machines or equipment to prevent unexpected energization, start-up or release of stored energy in order to prevent injury to employees.

(ii) When other standards in this part require the use of lockout or tagout, they shall be used and supplemented by the procedural and training requirements of this section.

(b) *Definitions applicable to this section.*

Affected employee. An employee whose job requires him/her to operate or use a machine or equipment on

which servicing or maintenance is being performed under lockout or tagout, or whose job requires him/her to work in an area in which such servicing or maintenance is being performed.

Authorized employee. A person who locks out or tags out machines or equipment in order to perform servicing or maintenance on that machine or equipment. An affected employee becomes an authorized employee when that employee's duties include performing servicing or maintenance covered under this section.

Capable of being locked out. An energy isolating device is capable of being locked out if it has a hasp or other means of attachment to which, or through which, a lock can be affixed, or it has a locking mechanism built into it. Other energy isolating devices are capable of being locked out, if lockout can be achieved without the need to dismantle, rebuild, or replace the energy isolating device or permanently alter its energy control capability.

Energized. Connected to an energy source or containing residual or stored energy.

Energy isolating device. A mechanical device that physically prevents the transmission or release of energy, including but not limited to the following: A manually operated electrical circuit breaker; a disconnect switch; a manually operated switch by which the conductors of a circuit can be disconnected from all ungrounded supply conductors, and, in addition, no pole can be operated independently; a line valve; a block; and any similar device used to block or isolate energy. Push buttons, selector switches and other control circuit type devices are not energy isolating devices.

Energy source. Any source of electrical, mechanical, hydraulic, pneumatic, chemical, thermal, or other energy.

Hot tap. A procedure used in the repair, maintenance and services activities which involves welding on a piece of equipment (pipelines, vessels or tanks) under pressure, in order to install connections or appurtenances. It is commonly used to replace or add sections of pipeline without the interruption of service for air, gas, water,

steam, and petrochemical distribution systems.

Lockout. The placement of a lockout device on an energy isolating device, in accordance with an established procedure, ensuring that the energy isolating device and the equipment being controlled cannot be operated until the lockout device is removed.

Lockout device. A device that utilizes a positive means such as a lock, either key or combination type, to hold an energy isolating device in a safe position and prevent the energizing of a machine or equipment. Included are blank flanges and bolted slip blinds.

Normal production operations. The utilization of a machine or equipment to perform its intended production function.

Servicing and/or maintenance. Workplace activities such as constructing, installing, setting up, adjusting, inspecting, modifying, and maintaining and/or servicing machines or equipment. These activities include lubrication, cleaning or unjamming of machines or equipment and making adjustments or tool changes, where the employee may be exposed to the *unexpected* energization or startup of the equipment or release of hazardous energy.

Setting up. Any work performed to prepare a machine or equipment to perform its normal production operation.

Tagout. The placement of a tagout device on an energy isolating device, in accordance with an established procedure, to indicate that the energy isolating device and the equipment being controlled may not be operated until the tagout device is removed.

Tagout device. A prominent warning device, such as a tag and a means of attachment, which can be securely fastened to an energy isolating device in accordance with an established procedure, to indicate that the energy isolating device and the equipment being controlled may not be operated until the tagout device is removed.

(c) *General*—(1) *Energy control program.* The employer shall establish a program consisting of energy control procedures, employee training and periodic inspections to ensure that

before any employee performs any servicing or maintenance on a machine or equipment where the unexpected energizing, start up or release of stored energy could occur and cause injury, the machine or equipment shall be isolated from the energy source, and rendered inoperative.

(2) *Lockout/tagout.* (i) If an energy isolating device is not capable of being locked out, the employer's energy control program under paragraph (c)(1) of this section shall utilize a tagout system.

(ii) If an energy isolating device is capable of being locked out, the employer's energy control program under paragraph (c)(1) of this section shall utilize lockout, unless the employer can demonstrate that the utilization of a tagout system will provide full employee protection as set forth in paragraph (c)(3) of this section.

(iii) After January 2, 1990, whenever replacement or major repair, renovation or modification of a machine or equipment is performed, and whenever new machines or equipment are installed, energy isolating devices for such machine or equipment shall be designed to accept a lockout device.

(3) *Full employee protection.* (i) When a tagout device is used on an energy isolating device which is capable of being locked out, the tagout device shall be attached at the same location that the lockout device would have been attached, and the employer shall demonstrate that the tagout program will provide a level of safety equivalent to that obtained by using a lockout program.

(ii) In demonstrating that a level of safety is achieved in the tagout program which is equivalent to the level of safety obtained by using a lockout program, the employer shall demonstrate full compliance with all tagout-related provisions of this standard together with such additional elements as are necessary to provide the equivalent safety available from the use of a lockout device. Additional means to be considered as part of the demonstration of full employee protection shall include the implementation of additional safety measures such as the removal of an isolating circuit element, blocking of a controlling switch, open-

ing of an extra disconnecting device, or the removal of a valve handle to reduce the likelihood of inadvertent energization.

(4) *Energy control procedure.* (i) Procedures shall be developed, documented and utilized for the control of potentially hazardous energy when employees are engaged in the activities covered by this section.

NOTE Exception: The employer need not document the required procedure for a particular machine or equipment, when all of the following elements exist: (1) The machine or equipment has no potential for stored or residual energy or reaccumulation of stored energy after shut down which could endanger employees; (2) the machine or equipment has a single energy source which can be readily identified and isolated; (3) the isolation and locking out of that energy source will completely deenergize and deactivate the machine or equipment; (4) the machine or equipment is isolated from that energy source and locked out during servicing or maintenance; (5) a single lockout device will achieve a locked-out condition; (6) the lockout device is under the exclusive control of the authorized employee performing the servicing or maintenance; (7) the servicing or maintenance does not create hazards for other employees; and (8) the employer, in utilizing this exception, has had no accidents involving the unexpected activation or reenergization of the machine or equipment during servicing or maintenance.

(ii) The procedures shall clearly and specifically outline the scope, purpose, authorization, rules, and techniques to be utilized for the control of hazardous energy, and the means to enforce compliance including, but not limited to, the following:

(A) A specific statement of the intended use of the procedure;

(B) Specific procedural steps for shutting down, isolating, blocking and securing machines or equipment to control hazardous energy;

(C) Specific procedural steps for the placement, removal and transfer of lockout devices or tagout devices and the responsibility for them; and

(D) Specific requirements for testing a machine or equipment to determine and verify the effectiveness of lockout devices, tagout devices, and other energy control measures.

(5) *Protective materials and hardware.* (i) Locks, tags, chains, wedges,

key blocks, adapter pins, self-locking fasteners, or other hardware shall be provided by the employer for isolating, securing or blocking of machines or equipment from energy sources.

(ii) Lockout devices and tagout devices shall be singularly identified; shall be the only device(s) used for controlling energy; shall not be used for other purposes; and shall meet the following requirements:

(A) *Durable.* (1) Lockout and tagout devices shall be capable of withstanding the environment to which they are exposed for the maximum period of time that exposure is expected.

(2) Tagout devices shall be constructed and printed so that exposure to weather conditions or wet and damp locations will not cause the tag to deteriorate or the message on the tag to become illegible.

(3) Tags shall not deteriorate when used in corrosive environments such as areas where acid and alkali chemicals are handled and stored.

(B) *Standardized.* Lockout and tagout devices shall be standardized within the facility in at least one of the following criteria: Color; shape; or size; and additionally, in the case of tagout devices, print and format shall be standardized.

(C) *Substantial—(1) Lockout devices.* Lockout devices shall be substantial enough to prevent removal without the use of excessive force or unusual techniques, such as with the use of bolt cutters or other metal cutting tools.

(2) *Tagout devices.* Tagout devices, including and their means of attachment, shall be substantial enough to prevent inadvertent or accidental removal. Tagout device attachment means shall be of a non-reusable type, attachable by hand, self-locking, and non-releasable with a minimum un-locking strength of no less than 50 pounds and having the general design and basic characteristics of being at least equivalent to a one-piece, all-environment-tolerant nylon cable tie.

(D) *Identifiable.* Lockout devices and tagout devices shall indicate the identity of the employee applying the device(s).

(iii) Tagout devices shall warn against hazardous conditions if the

machine or equipment is energized and shall include a legend such as the following: *Do Not Start, Do Not Open, Do Not Close, Do Not Energize, Do Not Operate.*

(6) *Periodic inspection.* (i) The employer shall conduct a periodic inspection of the energy control procedure at least annually to ensure that the procedure and the requirements of this standard are being followed.

(A) The periodic inspection shall be performed by an authorized employee other than the ones(s) utilizing the energy control procedure being inspected.

(B) The periodic inspection shall be conducted to correct any deviations or inadequacies identified.

(C) Where lockout is used for energy control, the periodic inspection shall include a review, between the inspector and each authorized employee, of that employee's responsibilities under the energy control procedure being inspected.

(D) Where tagout is used for energy control, the periodic inspection shall include a review, between the inspector and each authorized and affected employee, of that employee's responsibilities under the energy control procedure being inspected, and the elements set forth in paragraph (c)(7)(ii) of this section.

(ii) The employer shall certify that the periodic inspections have been performed. The certification shall identify the machine or equipment on which the energy control procedure was being utilized, the date of the inspection, the employees included in the inspection, and the person performing the inspection.

(7) *Training and communication.* (i) The employer shall provide training to ensure that the purpose and function of the energy control program are understood by employees and that the knowledge and skills required for the safe application, usage, and removal of the energy controls are acquired by employees. The training shall include the following:

(A) Each authorized employee shall receive training in the recognition of applicable hazardous energy sources, the type and magnitude of the energy available in the workplace, and the

methods and means necessary for energy isolation and control.

(B) Each affected employee shall be instructed in the purpose and use of the energy control procedure.

(C) All other employees whose work operations are or may be in an area where energy control procedures may be utilized, shall be instructed about the procedure, and about the prohibition relating to attempts to restart or reenergize machines or equipment which are locked out or tagged out.

(ii) When tagout systems are used, employees shall also be trained in the following limitations of tags:

(A) Tags are essentially warning devices affixed to energy isolating devices, and do not provide the physical restraint on those devices that is provided by a lock.

(B) When a tag is attached to an energy isolating means, it is not to be removed without authorization of the authorized person responsible for it, and it is never to be bypassed, ignored, or otherwise defeated.

(C) Tags must be legible and understandable by all authorized employees, affected employees, and all other employees whose work operations are or may be in the area, in order to be effective.

(D) Tags and their means of attachment must be made of materials which will withstand the environmental conditions encountered in the workplace.

(E) Tags may evoke a false sense of security, and their meaning needs to be understood as part of the overall energy control program.

(F) Tags must be securely attached to energy isolating devices so that they cannot be inadvertently or accidentally detached during use.

(iii) *Employee retraining.*

(A) Retraining shall be provided for all authorized and affected employees whenever there is a change in their job assignments, a change in machines, equipment or processes that present a new hazard, or when there is a change in the energy control procedures.

(B) Additional retraining shall also be conducted whenever a periodic inspection under paragraph (c)(6) of this section reveals, or whenever the employer has reason to believe, that

there are deviations from or inadequacies in the employee's knowledge or use of the energy control procedures.

(C) The retraining shall reestablish employee proficiency and introduce new or revised control methods and procedures, as necessary.

(iv) The employer shall certify that employee training has been accomplished and is being kept up to date. The certification shall contain each employee's name and dates of training.

(8) *Energy isolation.* Lockout or tagout shall be performed only by the authorized employees who are performing the servicing or maintenance.

(9) *Notification of employees.* Affected employees shall be notified by the employer or authorized employee of the application and removal of lockout devices or tagout devices. Notification shall be given before the controls are applied, and after they are removed from the machine or equipment.

(d) *Application of control.* The established procedures for the application of energy control (the lockout or tagout procedures) shall cover the following elements and actions and shall be done in the following sequence:

(1) *Preparation for shutdown.* Before an authorized or affected employee turns off a machine or equipment, the authorized employee shall have knowledge of the type and magnitude of the energy, the hazards of the energy to be controlled, and the method or means to control the energy.

(2) *Machine or equipment shutdown.* The machine or equipment shall be turned off or shut down using the procedures established for the machine or equipment. An orderly shutdown must be utilized to avoid any additional or increased hazard(s) to employees as a result of the equipment stoppage.

(3) *Machine or equipment isolation.* All energy isolating devices that are needed to control the energy to the machine or equipment shall be physically located and operated in such a manner as to isolate the machine or equipment from the energy source(s).

(4) *Lockout or tagout device application.* (i) Lockout or tagout devices shall be affixed to each energy isolating device by authorized employees.

(ii) Lockout devices, where used, shall be affixed in a manner to that will hold the energy isolating devices in a "safe" or "off" position.

(iii) Tagout devices, where used, shall be affixed in such a manner as will clearly indicate that the operation or movement of energy isolating devices from the "safe" or "off" position is prohibited.

(A) Where tagout devices are used with energy isolating devices designed with the capability of being locked, the tag attachment shall be fastened at the same point at which the lock would have been attached.

(B) Where a tag cannot be affixed directly to the energy isolating device, the tag shall be located as close as safely possible to the device, in a position that will be immediately obvious to anyone attempting to operate the device.

(5) *Stored energy.* (i) Following the application of lockout or tagout devices to energy isolating devices, all potentially hazardous stored or residual energy shall be relieved, disconnected, restrained, and otherwise rendered safe.

(ii) If there is a possibility of reaccumulation of stored energy to a hazardous level, verification of isolation shall be continued until the servicing or maintenance is completed, or until the possibility of such accumulation no longer exists.

(6) *Verification of isolation.* Prior to starting work on machines or equipment that have been locked out or tagged out, the authorized employee shall verify that isolation and deenergization of the machine or equipment have been accomplished.

(e) *Release from lockout or tagout.* Before lockout or tagout devices are removed and energy is restored to the machine or equipment, procedures shall be followed and actions taken by the authorized employee(s) to ensure the following:

(1) *The machine or equipment.* The work area shall be inspected to ensure that nonessential items have been removed and to ensure that machine or equipment components are operationally intact.

(2) *Employees.* (i) The work area shall be checked to ensure that all em-

employees have been safely positioned or removed.

(ii) After lockout or tagout devices have been removed and before a machine or equipment is started, affected employees shall be notified that the lockout or tagout device(s) have been removed.

(3) *Lockout or tagout devices removal.* Each lockout or tagout device shall be removed from each energy isolating device by the employee who applied the device. *Exception to paragraph (e)(3):* When the authorized employee who applied the lockout or tagout device is not available to remove it, that device may be removed under the direction of the employer, provided that specific procedures and training for such removal have been developed, documented and incorporated into the employer's energy control program. The employer shall demonstrate that the specific procedure provides equivalent safety to the removal of the device by the authorized employee who applied it. The specific procedure shall include at least the following elements:

(i) Verification by the employer that the authorized employee who applied the device is not at the facility;

(ii) Making all reasonable efforts to contact the authorized employee to inform him/her that his/her lockout or tagout device has been removed; and

(iii) Ensuring that the authorized employee has this knowledge before he/she resumes work at that facility.

(f) *Additional requirements.* (1) *Testing or positioning of machines, equipment or components thereof.* In situations in which lockout or tagout devices must be temporarily removed from the energy isolating device and the machine or equipment energized to test or position the machine, equipment or component thereof, the following sequence of actions shall be followed:

(i) Clear the machine or equipment of tools and materials in accordance with paragraph (e)(1) of this section;

(ii) Remove employees from the machine or equipment area in accordance with paragraph (e)(2) of this section;

(iii) Remove the lockout or tagout devices as specified in paragraph (e)(3) of this section;

(iv) Energize and proceed with testing or positioning;

(v) Deenergize all systems and reapply energy control measures in accordance with paragraph (d) of this section to continue the servicing and/or maintenance.

(2) *Outside personnel (contractors, etc.).* (i) Whenever outside servicing personnel are to be engaged in activities covered by the scope and application of this standard, the on-site employer and the outside employer shall inform each other of their respective lockout or tagout procedures.

(ii) The on-site employer shall ensure that his/her employees understand and comply with the restrictions and prohibitions of the outside employer's energy control program.

(3) *Group lockout or tagout.* (i) When servicing and/or maintenance is performed by a crew, craft, department or other group, they shall utilize a procedure which affords the employees a level of protection equivalent to that provided by the implementation of a personal lockout or tagout device.

(ii) Group lockout or tagout devices shall be used in accordance with the procedures required by paragraph (c)(4) of this section including, but not necessarily limited to, the following specific requirements:

(A) Primary responsibility is vested in an authorized employee for a set number of employees working under the protection of a group lockout or tagout device (such as an operations lock);

(B) Provision for the authorized employee to ascertain the exposure status of individual group members with regard to the lockout or tagout of the machine or equipment and

(C) When more than one crew, craft, department, etc. is involved, assignment of overall job-associated lockout or tagout control responsibility to an authorized employee designated to coordinate affected work forces and ensure continuity of protection; and

(D) Each authorized employee shall affix a personal lockout or tagout device to the group lockout device, group lockbox, or comparable mecha-

nism when he or she begins work, and shall remove those devices when he or she stops working on the machine or equipment being serviced or maintained.

(4) *Shift or personnel changes.* Specific procedures shall be utilized during shift or personnel changes to ensure the continuity of lockout or tagout protection, including provision for the orderly transfer of lockout or tagout device protection between off-going and oncoming employees, to minimize exposure to hazards from the unexpected energization or start-up of the machine or equipment, or the release of stored energy.

(The information collection requirements contained in this section are approved by the Office of Management and Budget (OMB) and listed under OMB control number 1218-0150)

NOTE: The following Appendix to § 1910.147 services as a non-mandatory guideline to assist employers and employees in complying with the requirements of this section, as well as to provide other helpful information. Nothing in the Appendix adds to or detracts from any of the requirements of this section.

APPENDIX A TO § 1910.147—Typical Minimal Lockout Procedure

General

The following simple lockout procedure is provided to assist employers in developing their procedures so they meet the requirements of this standard. When the energy isolating devices are not lockable, tagout may be used, provided the employer complies with the provisions of the standard which require additional training and more rigorous periodic inspections. When tagout is used and the energy isolating devices are lockable, the employer must provide full employee protection (see paragraph (c)(3)) and additional training and more rigorous periodic inspections are required. For more complex systems, more comprehensive procedures may need to be developed, documented and utilized.

Lockout Procedure

Lockout procedure for

(Name of Company for single procedure or identification of equipment if multiple procedures are used)

Purpose

This procedure establishes the minimum requirements for the lockout of energy iso-

lating devices whenever maintenance or servicing is done on machines or equipment. It shall be used to ensure that the machine or equipment is stopped, isolated from all potentially hazardous energy sources and locked out before employees perform any servicing or maintenance where the unexpected energization or start-up of the machine or equipment or release of stored energy could cause injury.

Compliance With This Program

All employees are required to comply with the restrictions and limitations imposed upon them during the use of lockout. The authorized employees are required to perform the lockout in accordance with this procedure. All employees, upon observing a machine or piece of equipment which is locked out to perform servicing or maintenance shall not attempt to start, energize or use that machine or equipment.

Type of compliance enforcement to be taken for violation of the above.

Sequence of Lockout

(1) Notify all affected employees that servicing or maintenance is required on a machine or equipment and that the machine or equipment must be shut down and locked out to perform the servicing or maintenance.

Name(s)/Job Title(s) of affected employees and how to notify.

(2) The authorized employee shall refer to the company procedure to identify the type and magnitude of the energy that the machine or equipment utilizes, shall understand the hazards of the energy, and shall know the methods to control the energy.

Type(s) and magnitude(s) of energy, its hazards and the methods to control the energy.

(3) If the machine or equipment is operating, shut it down by the normal stopping procedure (depress stop button, open switch, close valve, etc.).

Type(s) and location(s) of machine or equipment operating controls.

(4) De-activate the energy isolating device(s) so that the machine or equipment is isolated from the energy source(s).

Type(s) and location(s) of energy isolating devices.

(5) Lock out the energy isolating device(s) with assigned individual lock(s).

(6) Stored or residual energy (such as that in capacitors, springs, elevated machine

members, rotating flywheels, hydraulic systems, and air, gas, steam, or water pressure, etc.) must be dissipated or restrained by methods such as grounding, repositioning, blocking, bleeding down, etc.

Type(s) of stored energy—methods to dissipate or restrain.

(7) Ensure that the equipment is disconnected from the energy source(s) by first checking that no personnel are exposed, then verify the isolation of the equipment by operating the push button or other normal operating control(s) or by testing to make certain the equipment will not operate.

CAUTION: Return operating control(s) to neutral or "off" position after verifying the isolation of the equipment.

Method of verifying the isolation of the equipment.

(8) The machine or equipment is now locked out.

Restoring Equipment to Service. When the servicing or maintenance is completed and the machine or equipment is ready to return to normal operating condition, the following steps shall be taken.

(1) Check the machine or equipment and the immediate area around the machine or equipment to ensure that nonessential items have been removed and that the machine or equipment components are operationally intact.

(2) Check the work area to ensure that all employees have been safely positioned or removed from the area.

(3) Verify that the controls are in neutral.

(4) Remove the lockout devices and reenergize the machine or equipment.

Note: The removal of some forms of blocking may require reenergization of the machine before safe removal.

(5) Notify affected employees that the servicing or maintenance is completed and the machine or equipment is ready for use.

[54 FR 36687, Sept. 1, 1989, as amended at 54 FR 42498, Oct. 17, 1989; 55 FR 38685, 38686, Sept. 20, 1990]

§ 1910.148 Standards organizations.

Standard and specifications of the following organizations have been referenced in this subpart J:

- American National Standards Institute, 1430 Broadway, New York, NY 10018.
- National Association of Plumbing and Mechanical Officials, 5032 Alhambra Avenue, Los Angeles, CA 90032.
- American Society of Agricultural Engineers, 2950 Niles Road, Post Office Box 229, St. Joseph, MI 49085.

§ 1910.149 Effective dates.

(a) The provisions of this subpart J shall become effective on August 27, 1971, except as provided in the remaining paragraphs of this section.

(b) The following provisions shall become effective on February 15, 1972:

§ 1910.142(b) (2), (b) (5), (b) (7), (d) (6), (f), (g), (i) (1) and (2).

(c) Notwithstanding anything in paragraph (a), (b), or (d) of this section, any provision in any other section of this subpart which contains in itself a specific effective date or time limitation shall become effective on such date or shall apply in accordance with such limitation.

(d) Notwithstanding anything in paragraph (a) of this section, if any standard in 41 CFR part 50-204, other than a national consensus standard incorporated by reference in 50-204.2(a)(1), is or becomes applicable at any time to any employment and place of employment, by virtue of the Walsh-Healey Public Contracts Act, or the Service Contract Act of 1965, or the National Foundation on Arts and Humanities Act of 1965, any corresponding established Federal standard in this subpart J which is derived from 41 CFR part 50-204 shall also become effective, and shall be applicable to such employment and place of employment, on the same date.

§ 1910.150 Sources of standards.

The standards in this subpart J are derived from the following sources:

Sec.	Source
1910.141	ANSI Z4.1-1968, Minimum Requirements for Sanitation in Place of Employment.
1910.142	ANSI Z4.4-1968, Minimum Requirements for Sanitation in Temporary Labor Camps.
1910.143	ANSI Z4.2-1970, Minimum Requirements for Nonwater Carriage, Disposal Systems.
1910.144	ANSI Z53.1-1967, Safety Color Code for Marking Physical Hazards.
1910.145(a)-(e)	ANSI Z15.1-1968, Specifications for Accident Prevention Signs, and ANSI B114.1-1971, Slow-Moving Vehicle Identification Emblem.
1910.145(f)	ANSI Z15.2-1968, Specifications for Accident Prevention Tags.



shaw's

Shaw's Supermarkets, Inc.
P.O. Box 942, South Easton, MA 02375-0942
Tel (508) 894-7000 Fax (508) 894-7155

REMODELS / NEW STORE OPENINGS

ADMINISTRATIVE REQUIREMENTS – CONSTRUCTION PERSONNEL

All construction personnel will be required to wear I.D. badges on site at all times.

No smoking, eating or drinking inside building.

Use of supermarket lounge and toilet facilities will not be allowed.

Parking by construction personnel shall be in designated areas only.

Use of audio equipment inside the building is prohibited.

Anyone purchasing products from Shaw's must have a sales receipt immediately available for inspection.

Sexual harassment of any nature will not be tolerated.

All building access for construction personnel will be through one entrance. Anyone wishing to enter or leave the building must utilize this entrance. A security guard will be stationed at this entrance to log in and out all personnel. This badge entrance procedure will be strictly enforced.

Jobsite delivery access will be through one entrance. Access to alternate delivery entrances will not be permitted without prior approval to Shaw's.

State and local Health Department codes must be observed at all times. This includes limiting extent and duration of building openings, dust control and amount of construction debris.

Failure To Comply With The Requirements Outlined Above Will Result In Immediate Action By Shaw's

- 1. First Offense – Individual Removed From Premises.**
- 2. Second Offense – Responsible Subcontractor Removed Permanently From Premises.**
- 3. Any Infractions Will Adversely Impact Future Consideration Of Responsible Subcontractor**

TO OWNER:

PROJECT:

APPLICATION NO.:

Distribution to:

PERIOD TO:

OWNER

PROJECT NOS.:

ARCHITECT

FROM CONTRACTOR:

VIA ARCHITECT:

CONTRACT DATE:

CONTRACTOR

CONTRACT FOR:

CONTRACTOR'S APPLICATION FOR PAYMENT

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

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

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

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

CONTRACTOR:

By: _____ Date: _____

State of:

County of:

Subscribed and sworn to before
me this _____ day of _____

Notary Public:

My Commission expires: _____

ARCHITECT'S CERTIFICATE FOR PAYMENT

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

AMOUNT CERTIFIED \$ _____

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

ARCHITECT:

By: _____ Date: _____

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



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			FROM PREVIOUS APPLICATION (D + E)	THIS PERIOD		% (G + C)			
							1.000		
1.000	General Conditions								
1.001	Overhead & Profit								
1.002	Perf. & Pay. Bond								
1.003	Budget-All Construction								
1.020	Allowances								
1.030	Clean-Up								
1.031	Dumpsters								
1.040	Travel								
1.043	Jobsite Supervision								
1.044	Project Management (Bld'g Only)								
1.045	Insurance								
1.046	Layout & Engineering								
1.050	Construction Schedule								
1.051	Construction Photos								
1.060	Blueprinting								
1.061	Temporary Fencing								
1.070	Permits								
1.071	Testing								
1.530	Winter Conditions								
1.535	Temporary Facilities								
1.536	Utility Co. Backcharges								
1.537	Temporary Protection								
1.538	Safety								
1.580	Small Tools & Equipment								
1.540	Security								
1.580	Small Tools & Equipment								
1.590	Storage Facilities								
1.600	Punch List								



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			D FROM PREVIOUS APPLICATION (D + E)	E THIS PERIOD		% (G + C)			
1.700	Warranty & Close-Out								
1.800	Wash & Wax Floors								
2.000	Sitework								
2.000	Sitework								
2.044	Project Management (Site Only)								
2.100	Mobilization								
2.101	Site Concrete (Structures)								
2.102	Off-Site Improvements								
2.103	Field Engineering								
2.104	Budget-All Sitework								
2.105	Building Demolition								
2.106	Precast Retaining Wall								
2.107	T-Wall								
2.108	Sitework								
2.110	Clear, Grub & Strip								
2.120	Earthwork								
2.121	Dynamic Compactions								
2.122	Erosion Control								
2.123	Unsuitable Earth Excavation								
2.124	Solid Waste Removal								
2.125	Hazardous Mat'l Removal								
2.126	Ledge Removal								
2.127	Fine Grading								
2.150	Bituminous Paving								
2.151	Aggregate Base Courses								
2.152	Concrete Pads								
2.153	Site Sidewalks								
2.154	Pavement Marking & Signage								



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			FROM PREVIOUS APPLICATION (D + E)	THIS PERIOD		%	(G ÷ C)		
2.155	Town Fees								
2.156	Precast Curbing								
2.157	Granite Curbing								
2.160	Gas								
2.161	Domestic Water Service								
2.165	Fire Protection								
2.166	Electric Service								
2.167	Transformer Pad								
2.170	Sanitary Sewerage								
2.171	Subsurface Disposal Sys.								
2.172	Storm Drainage								
2.190	Landscaping								
2.191	Light Pole Bases								
2.192	Site Lighting								
2.193	Telephone								
2.194	Traffic Signals								
2.195	Fencing								
2.196	Bollards								
2.199	Site Clean-Up								
2.350	Piles Caissons								
2.351	Sheathing								
2.355	Sign Allowance								
2.356	Rte 60 Allowance								
2.200	Building Excavation								
2.200	Building Excavation								
2.201	Excavate & BF Foundations								
2.205	Building Fill								
2.206	Underdrains								



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SEARCHED
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INDEXED
FILED

AIA Document G702, APPLICATION AND CERTIFICATE FOR PAYMENT, containing Contractor's signed Certification, is attached.

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ARCHITECT'S PROJECT NO.:

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			FROM PREVIOUS APPLICATION (D + E)	THIS PERIOD		% (G + C)			
2.207	Excavation & BF Utilities								
3.000	Concrete								
3.000	Concrete								
3.300	C.I.P. Foundations								
3.301	Interior Footings								
3.302	Refrigeration Pits								
3.305	C.I.P. Slabs								
3.306	Sidewalks								
3.307	Exterior Stairs								
3.310	Grout Angle								
3.400	Miscellaneous Precast								
3.450	Precast Walls								
3.500	Concrete Testing								
4.000	Masonry								
4.000	Masonry								
4.200	Brick								
4.201	Brick Cleaning								
4.205	Unit Masonry								
4.206	Scored/Split Faced Block								
5.000	Metals								
5.000	Metals								
5.100	Structural Steel								
5.105	Steel Erection								
5.210	Joists								



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			FROM PREVIOUS APPLICATION (D + E)	THIS PERIOD		%	(G ÷ C)		
5.300	Deck								
5.400	Light Gauge Metal Framing								
5.500	Metal Fabrications								
5.501	Metal Stairs								
5.502	Metal Pipe Railings								
5.505	Pit Hatch Ladder								
5.000	Carpentry								
5.000	Carpentry								
5.100	Rough Carpentry (Excl. Canopy)								
5.200	Finish Carpentry (Excl. Canopy)								
5.205	Install Durus Doors								
5.998	Owner's Equipment								
7.000	Moisture Protection								
7.000	Moisture Protection								
7.101	Emergency Roof Repairs								
7.105	Asphalt Shingles								
7.110	Bit. Waterproofing								
7.200	Foundation Insulation								
7.210	Roof Insulation								
7.240	Ext. Insul. & Finish System								
7.400	Metal Siding								
7.530	Single Ply Roofing System								
7.531	Fully Adhered Roofing								
7.532	Asphalt Shingles								
7.600	Flashing, Sheetmetal, Etc.								
7.700	Roof Accessories								



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containing Contractor's signed Certification, is attached.

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			D FROM PREVIOUS APPLICATION (D + E)	E THIS PERIOD		% (G + C)			
7.900	Joint Sealants								
8.000	Doors & Windows								
8.000	Doors & Windows								
8.100	H.M. Doors & Frames								
8.200	Wood Doors								
8.205	Wood Windows								
8.305	Access Doors								
8.350	Flexible Doors								
8.360	Overhead Doors								
8.410	Aluminum Ent./Storefront								
8.415	Automatic Doors								
8.700	Builder's Hardware								
8.705	Re-Keying								
8.800	Glass & Glazing								
9.000	Finishes								
9.000	Finishes								
9.250	Gypsum Drywall								
9.300	Tile								
9.510	Acoustic Ceilings								
9.650	Resilient Flooring								
9.651	Carpeting								
9.652	Epoxy Flooring								
9.653	Flash Patching								
9.900	Painting								
9.911	Linear Aluminum								
9.950	Wall Coverings								



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			FROM PREVIOUS APPLICATION (D + E)	THIS PERIOD		% (G + C)			
							9.951 Glassboard		
10.000 Specialties									
10.000 Specialties									
10.160 Toilet Partitions									
10.200 Corner Guards									
10.250 Louvers									
10.400 Hanging Elements									
10.450 Banners									
10.522 Fire Ext/Cab & Acc.									
10.600 Mesh Partitions									
10.700 Pedigrids									
10.800 Toilet Accessories									
10.990 Miscellaneous Items									
11.000 Equipment									
11.000 Equipment									
11.160 Loading Dock Equipment									
11.200 Folding Partition									
13.000 Special Construction									
13.000 Special Construction									
13.100 Interior Demolition (Remodels)									
13.200 Canopy Complete									
13.210 Canopy - Retail									
13.220 Canopy - Retain Sprinklers									
13.300 Professional Movers									



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SAMPLE

AIA Document G702, APPLICATION AND CERTIFICATE FOR PAYMENT, containing Contractor's signed Certification, is attached.

In tabulations below, amounts are stated to the nearest dollar. Use Column I on Contracts where variable retainage for line items may apply.

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

A ITEM NO.	B DESCRIPTION OF WORK	C SCHEDULED VALUE	D WORK COMPLETED		F MATERIALS PRESENTLY STORED (NOT IN D OR E)	G		H BALANCE TO FINISH (C - G)	I RETAINAGE (IF VARIABLE) RATE
			D + E FROM PREVIOUS APPLICATION	E THIS PERIOD		(D + E + F)	(G + C) %		
3.400	Structural Floor Repairs								
3.500	Mechanical Supports (Temporary)								
3.900	Asbestos Removal								
4.000	Conveying Systems								
4.000	Conveying Systems								
4.100	Elevators								
4.400	Lift								
5.000	Mechanical-Plumbing								
5.000	Mechanical-Plumbing								
5.421	Fixtures								
5.430	Sanitary								
5.431	Indirect								
5.432	Stormwater								
5.433	Domestic								
5.434	Gas Piping								
5.435	Water Treatment (Culligan)								
5.436	Pipe Reclaim Tanks								
5.437	Sewage Ejectors								
5.438	Water/Booster Heater								
5.350	Mechanical/HVAC								
5.258	Duct Insulation								
5.350	Mechanical-HVAC								
5.781	Packaged R.T.U.'s								
5.785	Computer Room A.C. Units								



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

A ITEM NO.	B DESCRIPTION OF WORK	C SCHEDULED VALUE	D WORK COMPLETED		F MATERIALS PRESENTLY STORED, (NOT IN D OR E)	G TOTAL COMPLETED AND STORED TO DATE (D + E + F)		H BALANCE TO FINISH (C - G)	I RETAINAGE (IF VARIABLE) RATE
			FROM PREVIOUS APPLICATION (D + E)	THIS PERIOD		% (G ÷ C)			
15.835	Therm Heat Transfer Unit								
15.835	Unit Heaters								
15.870	Exhaust Fans								
15.871	Hoods								
15.872	Mechanical Louvers								
15.885	Filters								
15.890	Ductwork & Accessories								
15.900	Duct Cleaning								
15.910	Registers, Grilles & Diffusers								
15.920	Dampers								
15.930	Oven Stack								
15.950	Controls & Instruments								
15.990	Testing & Balancing Air System								
15.991	Systems Startup								
15.500	Mechanical-Plumbing/Equipment								
15.500	Shaw's Supplied Mech-Plumbing/Equipment								
15.510	Piping & Connections for Cases								
15.520	Piping & Connections for Equipment								
6.000	Electrical								
6.000	Electrical								
6.110	Raceway Systems								
6.115	Underfloor Duct System								
6.115	Underlab Electric								
6.120	Feeders								
6.125	Branch Circuit Wiring								
6.128	Temporary Wiring								



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Use Column I on Contracts where variable retainage for line items may apply.

APPLICATION NO.:

APPLICATION DATE:

PERIOD TO:

ARCHITECT'S PROJECT NO.:

A ITEM NO.	B DESCRIPTION OF WORK	C SCHEDULED VALUE	D WORK COMPLETED		F MATERIALS PRESENTLY STORED (NOT IN D OR E)	G TOTAL COMPLETED AND STORED TO DATE (D+E+F)		H BALANCE TO FINISH (C - G)	I RETAINAGE (IF VARIABLE) RATE
			FROM PREVIOUS APPLICATION (D + E)	THIS PERIOD		(G + C)	%		
16.140	Devices								
16.300	Primary Wiring								
16.420	Secondary Wiring								
16.425	Switchgear								
16.450	Grounding Systems								
16.470	Distribution								
16.501	Lamps & Ballasts								
16.510	Building Lighting Fixtures								
16.511	Wall Mtd. Exterior Lighting								
16.520	Site Lighting Fixtures								
16.600	Facilities Management Sys.								
16.620	Standby Power System								
16.700	Shaw's Special Systems								
16.720	Fire Alarm Systems								
16.750	Telephone								
16.900	Electrical Permits								
16.500	Electrical/Equipment Wiring								
16.145	Refrigeration Case Wiring								
16.150	Shaw's Equipment Wiring								
16.500	Shaw's Supplied Electrical/Equipment Wiring								
16.721	P.A. System								



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SAMPLE

CERTIFICATE OF SUBSTANTIAL COMPLETION

AIA DOCUMENT G704
(Instructions on reverse side)

OWNER
 ARCHITECT
 CONTRACTOR
 FIELD
 OTHER

PROJECT:
(Name and address)

PROJECT NO.:

CONTRACT FOR:
CONTRACT DATE:

TO OWNER:
(Name and address)

TO CONTRACTOR:
(Name and address)

DATE OF ISSUANCE:
PROJECT OR DESIGNATED PORTION SHALL INCLUDE:

The Work performed under this Contract has been reviewed and found, to the Architect's best knowledge, information and belief, to be substantially complete. 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. The date of Substantial Completion of the Project or portion thereof designated above is hereby established as

which is also the date of commencement of applicable warranties required by the Contract Documents, except as stated below:

A list of items to be completed or corrected is attached hereto. The failure to include any items on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

ARCHITECT BY _____ DATE _____

The Contractor will complete or correct the Work on the list of items attached hereto within _____ days from the above date of Substantial Completion.

CONTRACTOR BY _____ DATE _____

The Owner accepts the Work or designated portion thereof as substantially complete and will assume full possession thereof at _____ (time) on _____ (date).

OWNER BY _____ DATE _____

The responsibilities of the Owner and the Contractor for security, maintenance, heat, utilities, damage to the Work and insurance shall be as follows:

(Note—Owner's and Contractor's legal and insurance counsel should determine and review insurance requirements and coverage.)

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CONTRACTOR'S AFFIDAVIT OF PAYMENT OF DEBTS AND CLAIMS

AIA Document G706

(Instructions on reverse side)

OWNER

ARCHITECT

CONTRACTOR

SURETY

OTHER

TO OWNER:
(Name and address)

ARCHITECT'S PROJECT NO.:

CONTRACT FOR:

PROJECT:
(Name and address)

CONTRACT DATED:

STATE OF:
COUNTY OF:

The undersigned hereby certifies that, except as listed below, payment has been made in full and all obligations have otherwise been satisfied for all materials and equipment furnished, for all work, labor, and services performed, and for all known indebtedness and claims against the Contractor for damages arising in any manner in connection with the performance of the Contract referenced above for which the Owner or Owner's property might in any way be held responsible or encumbered.

EXCEPTIONS:

SUPPORTING DOCUMENTS ATTACHED HERETO:

1. Consent of Surety to Final Payment. Whenever Surety is involved, Consent of Surety is required. AIA Document G707. Consent of Surety, may be used for this purpose.

Indicate attachment: yes no

The following supporting documents should be attached hereto if required by the Owner:

1. Contractor's Release or Waiver of Liens, conditional upon receipt of final payment.
2. Separate Releases or Waivers of Liens from Subcontractors and material and equipment suppliers, to the extent required by the Owner, accompanied by a list thereof.
3. Contractor's Affidavit of Release of Liens (AIA Document G706A).

CONTRACTOR:
(Name and address)

BY: _____
(Signature of authorized representative)

(Printed name and title)

Subscribed and sworn to before me on this date:

Notary Public:

My Commission Expires:

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CONTRACTOR'S AFFIDAVIT OF RELEASE OF LIENS

AIA Document G706A

(Instructions on reverse side)

OWNER
ARCHITECT
CONTRACTOR
SURETY
OTHER

TO OWNER:
(Name and address)

ARCHITECT'S PROJECT NO.:

CONTRACT FOR:

PROJECT:
(Name and address)

CONTRACT DATED:

STATE OF:
COUNTY OF:

The undersigned hereby certifies that to the best of the undersigned's knowledge, information and belief, except as listed below, the Releases or Waivers of Lien attached hereto include the Contractor, all Subcontractors, all suppliers of materials and equipment, and all performers of Work, labor or services who have or may have liens or encumbrances or the right to assert liens or encumbrances against any property of the Owner arising in any manner out of the performance of the Contract referenced above.

EXCEPTIONS:

SUPPORTING DOCUMENTS ATTACHED HERETO:

1. Contractor's Release or Waiver of Liens, conditional upon receipt of final payment.
2. Separate Releases or Waivers of Liens from Subcontractors and material and equipment suppliers, to the extent required by the Owner, accompanied by a list thereof.

CONTRACTOR:
(Name and address)

BY: _____
(Signature of authorized representative)

(Printed name and title)

Subscribed and sworn to before me on this date:

Notary Public:

My Commission Expires:

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SECTION 00700

GENERAL CONDITIONS

1.01 GENERAL

- A. The "General Conditions of the Contract for Construction," AIA Document A201-1997 edition of the American Institute of Architects is part of this Project Manual, except where supplementary conditions require changes, in which case the supplementary conditions shall govern. The General Conditions of the Contract for Construction is printed herein for information.

END OF SECTION



General Conditions of the Contract for Construction

AIA Document A201 - 1997
1997 Edition - Electronic Format

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification. AUTHENTICATION OF THIS ELECTRONICALLY DRAFTED AIA DOCUMENT MAY BE MADE BY USING AIA DOCUMENT D401.

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

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ARTICLE 1 GENERAL PROVISIONS

1.1 BASIC DEFINITIONS

1.1.1 THE CONTRACT DOCUMENTS

The Contract Documents consist of the Agreement between Owner and Contractor (hereinafter the Agreement), Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive or (4) a written order for a minor change in the Work issued by the Architect. Unless specifically enumerated in the Agreement, the Contract Documents do not include other documents such as bidding requirements (advertisement or invitation to bid, Instructions to Bidders, sample forms, the Contractor's bid or portions of Addenda relating to bidding requirements).

1.1.2 THE CONTRACT

The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Architect and Contractor, (2) between the Owner and a Subcontractor or Sub-subcontractor, (3) between the Owner and Architect or (4) between any persons or entities other than the Owner and Contractor. The Architect shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of the Architect's duties.

1.1.3 THE WORK

The term "Work" means the construction and services required by the Contract Documents, whether completed or partially completed; and includes all other labor, materials, equipment and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project.

1.1.4 THE PROJECT

The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by the Owner or by separate contractors.

1.1.5 THE DRAWINGS

The Drawings are the graphic and pictorial portions of the Contract Documents showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules and diagrams.

1.1.6 THE SPECIFICATIONS

The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, systems, standards and workmanship for the Work, and performance of related services.

1.1.7 THE PROJECT MANUAL

The Project Manual is a volume assembled for the Work which may include the bidding requirements, sample forms, Conditions of the Contract and Specifications.

1.2 CORRELATION AND INTENT OF THE CONTRACT DOCUMENTS

1.2.1 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results.

1.2.2 Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.

1.2.3 Unless otherwise stated in the Contract Documents, words which have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings.

1.3 CAPITALIZATION

1.3.1 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.

1.4 INTERPRETATION

1.4.1 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.

1.5 EXECUTION OF CONTRACT DOCUMENTS

1.5.1 The Contract Documents shall be signed by the Owner and Contractor. If either the Owner or Contractor or both do not sign all the Contract Documents, the Architect shall identify such unsigned Documents upon request.

1.5.2 Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become generally familiar with local conditions under which the Work is to be performed and correlated personal observations with requirements of the Contract Documents.

1.6 OWNERSHIP AND USE OF DRAWINGS, SPECIFICATIONS AND OTHER INSTRUMENTS OF SERVICE

1.6.1 The Drawings, Specifications and other documents, including those in electronic form, prepared by the Architect and the Architect's consultants are Instruments of Service through which the Work to be executed by the Contractor is described. The Contractor may retain one record set. Neither the Contractor nor any Subcontractor, Sub-subcontractor or material or equipment supplier shall own or claim a copyright in the Drawings, Specifications and other documents prepared by the Architect or the Architect's consultants, and unless otherwise indicated the Architect and the Architect's consultants shall be deemed the authors of them and will retain all common law, statutory and other reserved rights, in addition to the copyrights. All copies of Instruments of Service, except the Contractor's record set, shall be returned or suitably accounted for to the Architect, on request, upon completion of the Work. The Drawings, Specifications and other documents prepared by the Architect and the Architect's consultants, and copies thereof furnished to the Contractor, are for use solely with respect to this Project. They are not to be used by the Contractor or any Subcontractor, Sub-subcontractor or material or equipment supplier on other projects or for additions to this Project outside the scope of the Work without the specific written consent of the Owner, Architect and the Architect's consultants. The Contractor, Subcontractors, Sub-subcontractors and material or equipment suppliers are authorized to use and reproduce applicable portions of the Drawings, Specifications and other documents prepared by the Architect and the Architect's consultants appropriate to and for use in the execution of their Work under the Contract Documents. All copies made under this authorization shall bear the statutory copyright notice, if any, shown on the Drawings, Specifications and other documents prepared by the Architect and the Architect's consultants. 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 or Architect's consultants' copyrights or other reserved rights.

ARTICLE 2 OWNER

2.1 GENERAL

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 Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner's approval or authorization. Except as otherwise provided in Subparagraph 4.2.1, the Architect does not have such authority. The term "Owner" means the Owner or the Owner's authorized representative.

2.1.2 The Owner shall furnish to the Contractor within fifteen days after receipt of a written request, information 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.

2.2 INFORMATION AND SERVICES REQUIRED OF THE OWNER

2.2.1 The Owner shall, at the written request of the Contractor, prior to commencement of the Work and thereafter, furnish to the Contractor reasonable evidence that financial arrangements have been made to fulfill the Owner's obligations under the Contract. Furnishing of such evidence shall be a condition precedent to commencement or continuation of the Work. After such evidence has been furnished, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.

2.2.2 Except for permits and fees, including those required under Subparagraph 3.7.1, 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.

2.2.3 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. The Contractor shall be entitled to rely on the accuracy of information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work.

2.2.4 Information or services required of the Owner by the Contract Documents shall be furnished by the Owner with reasonable promptness. Any other information or services relevant to the Contractor's performance of the Work under the Owner's control shall be furnished by the Owner after receipt from the Contractor of a written request for such information or services.

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.

2.3 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 may issue a written order to 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 three-day period. If the Contractor within such three-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 reasonable cost of correcting such deficiencies, including Owner's expenses and compensation for the Architect's additional services 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 GENERAL

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.

3.1.2 The Contractor shall perform the Work in accordance with the Contract Documents.

3.1.3 The Contractor shall not be relieved of obligations to perform the Work in accordance with the Contract Documents

either by activities or duties of the Architect in the Architect's administration of the Contract, or by tests, inspections or approvals required or performed by persons other than the Contractor.

2 REVIEW OF CONTRACT DOCUMENTS AND FIELD CONDITIONS BY CONTRACTOR

3.2.1 Since the Contract Documents are complementary, before starting each portion of the Work, the Contractor shall carefully study and compare the various Drawings and other Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Subparagraph 2.2.3, shall take field measurements of any existing conditions related to that portion of the Work and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, any errors, inconsistencies or omissions discovered by the Contractor shall be reported promptly to the Architect as a request for information in such form as the Architect may require.

3.2.2 Any design errors or omissions noted by the Contractor during this review shall be reported promptly to the Architect, but it is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional unless otherwise specifically provided in the Contract Documents. The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, building codes, and rules and regulations, but any nonconformity discovered by or made known to the Contractor shall be reported promptly to the Architect.

3.2.3 If the Contractor believes that additional cost or time is involved because of clarifications or instructions issued by the Architect in response to the Contractor's notices or requests for information pursuant to Subparagraphs 3.2.1 and 3.2.2, the Contractor shall make Claims as provided in Subparagraphs 4.3.6 and 4.3.7. If the Contractor fails to perform the obligations of Subparagraphs 3.2.1 and 3.2.2, the Contractor shall pay such costs and damages to the Owner as would have been avoided if the Contractor had performed such obligations. The Contractor shall not be liable to the Owner or Architect for damages resulting from errors, inconsistencies or omissions in the Contract Documents or for differences between field measurements or conditions and the Contract Documents unless the Contractor recognized such error, inconsistency, omission or difference and knowingly failed to report it to the Architect.

3.3 SUPERVISION AND CONSTRUCTION PROCEDURES

3.3.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for and have control over construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Contract, unless the Contract Documents give other specific instructions concerning these matters. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences or procedures, the Contractor shall evaluate the jobsite safety thereof and, except as stated below, shall be fully and solely responsible for the jobsite safety of such means, methods, techniques, sequences or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely written notice to the Owner and Architect and shall not proceed with that portion of the Work without further written instructions from the Architect. If the Contractor is then instructed to proceed with the required means, methods, techniques, sequences or procedures without acceptance of changes proposed by the Contractor, the Owner shall be solely responsible for any resulting loss or damage.

3.3.2 The Contractor shall be responsible to the Owner for acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and other persons or entities performing portions of the Work for or on behalf of the Contractor or any of its Subcontractors.

3.3.3 The Contractor shall be responsible for inspection of portions of Work already performed to determine that such portions are in proper condition to receive subsequent Work.

3.4 LABOR AND MATERIALS

3.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

3.4.2 The Contractor may make substitutions only with the consent of the Owner, after evaluation by the Architect and in accordance with a Change Order.

3.4.3 The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Contract. The Contractor shall not permit employment of unfit persons or persons not skilled in tasks assigned to them.

3.5 WARRANTY

3.5.1 The Contractor warrants to the Owner and Architect that materials and equipment furnished under the Contract will be of good quality and new unless otherwise required or permitted by the Contract Documents, that the Work will be free from defects not inherent in the quality required or permitted, and that the Work will conform to the requirements of the Contract Documents. Work not conforming to these requirements, including substitutions not properly approved and authorized, may be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse, modifications not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage. If required by the Architect, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

3.6 TAXES

3.6.1 The Contractor shall pay sales, consumer, use and similar taxes for the Work provided by the Contractor which are legally enacted when bids are received or negotiations concluded, whether or not yet effective or merely scheduled to go into effect.

3.7 PERMITS, FEES AND NOTICES

3.7.1 Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit and other permits and governmental fees, licenses and inspections necessary for proper execution and completion of the Work which are customarily secured after execution of the Contract and which are legally required when bids are received or negotiations concluded.

3.7.2 The Contractor shall comply with and give notices required by laws, ordinances, rules, regulations and lawful orders of public authorities applicable to performance of the Work.

3.7.3 It is not the Contractor's responsibility to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, building codes, and rules and regulations. However, if the Contractor observes that portions of the Contract Documents are at variance therewith, the Contractor shall promptly notify the Architect and Owner in writing, and necessary changes shall be accomplished by appropriate Modification.

3.7.4 If the Contractor performs Work knowing it to be contrary to laws, statutes, ordinances, building codes, and rules and regulations without such notice to the Architect and Owner, the Contractor shall assume appropriate responsibility for such Work and shall bear the costs attributable to correction.

3.8 ALLOWANCES

3.8.1 The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct, but the Contractor shall not be required to employ persons or entities to whom the Contractor has reasonable objection.

3.8.2 Unless otherwise provided in the Contract Documents:

- .1 allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;
- .2 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 but not in the allowances;

- .3 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 3.8.2.1 and (2) changes in Contractor's costs under Clause 3.8.2.2.

3.8.3 Materials and equipment under an allowance shall be selected by the Owner in sufficient time to avoid delay in the Work.

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 perform the Work in general accordance with the most recent schedules submitted to the Owner and Architect.

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 field changes and selections made during construction, and one record copy of 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 by the Contract Documents the way by which 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. Informational submittals upon which the Architect is not expected to take responsive action may be so identified in the Contract Documents. Submittals which are not required by the Contract Documents may be returned by the Architect without action.

3.12.5 The Contractor shall review for compliance with the Contract Documents, 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 which are not marked as reviewed for compliance with the Contract Documents and approved by the Contractor may be returned by the Architect without action.

3.12.6 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.

3.12.7 The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples or similar submittals until the respective submittal has been approved by the Architect.

3.12.8 The Work shall be in accordance with approved submittals except that 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 (1) the Architect has given written approval to the specific deviation as a minor change in the Work, or (2) a Change Order or Construction Change Directive has been issued authorizing the 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. In the absence of such written notice the Architect's approval of a resubmission shall not apply to such revisions.

3.12.10 The Contractor shall not be required to provide professional services which constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. The Contractor shall not be required to provide professional services in violation of applicable law. If professional design services or certifications by a design professional related to systems, materials or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect will specify all performance and design criteria that such services must satisfy. The Contractor shall cause such services or certifications to be provided by a properly licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Architect. The Owner and the Architect shall be entitled to rely upon the adequacy, accuracy and completeness of the services, certifications or approvals performed by such design professionals, provided the Owner and Architect have specified to the Contractor all performance and design criteria that such services must satisfy. Pursuant to this Subparagraph 3.12.10, the Architect will review, approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Contractor shall not be responsible for the adequacy of the performance or design criteria required by the Contract Documents.

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 Owner or a separate contractor except with written consent of the Owner and of such separate contractor; such consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold from the Owner or a separate contractor the Contractor's consent to cutting or otherwise altering the Work.

3.15 CLEANING UP

3.15.1 The Contractor shall keep the premises and surrounding area free from accumulation of waste materials or rubbish caused by operations under the Contract. At completion of the Work, the Contractor shall remove from and about the Project waste materials, rubbish, the Contractor's tools, construction equipment, machinery and surplus materials.

3.15.2 If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so and the cost thereof shall be charged to the Contractor.

3.16 ACCESS TO WORK

3.16.1 The Contractor shall provide the Owner and Architect access to the Work in preparation and progress wherever located.

3.17 ROYALTIES, PATENTS AND COPYRIGHTS

3.17.1 The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of copyrights and patent rights and shall hold the Owner and Architect harmless from loss on account thereof, but shall not be responsible for such defense or loss when a particular design, process or product of a particular manufacturer or manufacturers is required by the Contract Documents or where the copyright violations are contained in Drawings, Specifications or other documents prepared by the Owner or Architect. However, if the Contractor has reason to believe that the required design, process or product is an infringement of a copyright or a patent, the Contractor shall be responsible for such loss unless such information is promptly furnished to the Architect.

3.18 INDEMNIFICATION

3.18.1 To the fullest extent permitted by law and to the extent claims, damages, losses or expenses are not covered by Project Management Protective Liability insurance purchased by the Contractor in accordance with Paragraph 11.3, the Contractor shall indemnify and hold harmless the Owner, 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, 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), but only to the extent caused by the negligent acts or omissions of the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they 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 Paragraph 3.18.

3.18.2 In claims against any person or entity indemnified under this Paragraph 3.18 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, the indemnification obligation under Subparagraph 3.18.1 shall not be limited by a limitation on amount or type of damages, compensation or benefits payable by or for the Contractor or a Subcontractor under workers' compensation acts, disability benefit acts or other employee benefit acts.

ARTICLE 4 ADMINISTRATION OF THE CONTRACT

4.1 ARCHITECT

4.1.1 The Architect is the person lawfully licensed to practice architecture or an entity lawfully practicing architecture identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The term "Architect" means the Architect or the Architect's authorized representative.

4.1.2 Duties, responsibilities and limitations of authority of the Architect as set forth in the Contract Documents shall not be restricted, modified or extended without written consent of the Owner, Contractor and Architect. Consent shall not be unreasonably withheld.

4.1.3 If the employment of the Architect is terminated, the Owner shall employ a new Architect against whom the Contractor has no reasonable objection and whose status under the Contract Documents shall be that of the former Architect.

4.2 ARCHITECT'S ADMINISTRATION OF THE CONTRACT

4.2.1 The Architect will provide administration of the Contract as described in the Contract Documents, and will be an Owner's representative (1) during construction, (2) until final payment is due and (3) with the Owner's concurrence, from time to time during the one-year period for correction of Work described in Paragraph 12.2. The Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents, unless otherwise modified in writing in accordance with other provisions of the Contract.

4.2.2 The Architect, as a representative of the Owner, will visit the site at intervals appropriate to the stage of the Contractor's operations (1) to become generally familiar with and to keep the Owner informed about the progress and quality of the portion of the Work completed, (2) to endeavor to guard the Owner against defects and deficiencies in the Work, and (3) to determine in general if the Work is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents. However, the Architect will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. The Architect will neither have control over or charge of, nor be responsible for, the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents, except as provided in Subparagraph 3.3.1.

4.2.3 The Architect will not be responsible for the Contractor's failure to perform the Work in accordance with the requirements of the Contract Documents. The Architect will not have control over or charge of and will not be responsible for acts or omissions of the Contractor, Subcontractors, or their agents or employees, or any other persons or entities 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 with each other through the Architect about matters arising out of or relating to the Contract. 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 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 that does not conform to the Contract Documents. Whenever the Architect considers it necessary or advisable, the Architect will have authority to require 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 or entities 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 in writing within any time limits agreed upon or otherwise with reasonable promptness. 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 initial 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 initiated by written notice. The responsibility to substantiate Claims shall rest with the party making the Claim.

4.3.2 **Time Limits on Claims.** Claims by either party must be initiated 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 initiated by written notice to the Architect and the other party.

4.3.3 **Continuing Contract Performance.** Pending final resolution of a Claim except as otherwise agreed in writing or as provided in Subparagraph 9.7.1 and Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents.

4.3.4 **Claims for Concealed or Unknown Conditions.** If conditions are encountered at the site which are (1) subsurface or otherwise concealed physical conditions which differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature, which differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, then notice by the observing party shall be given to the other party promptly before conditions are disturbed and in no event later than 21 days after first observance of the conditions. The Architect will promptly investigate such conditions and, if they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend an equitable adjustment in the Contract Sum or Contract Time, or both. If the Architect determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect shall so notify the Owner and Contractor in writing, stating the reasons. Claims by either party in opposition to

such determination must be made within 21 days after the Architect has given notice of the decision. If the conditions encountered are materially different, the Contract Sum and Contract Time shall be equitably adjusted, but if the Owner and Contractor cannot agree on an adjustment in the Contract Sum or Contract Time, the adjustment shall be referred to the Architect for initial determination, subject to further proceedings pursuant to Paragraph 4.4.

4.3.5 Claims for Additional Cost. If the Contractor wishes to make Claim for an increase in the Contract Sum, written notice as provided herein shall be given before proceeding to execute the Work. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Paragraph 10.6.

4.3.6 If the Contractor believes additional cost is involved for reasons including but not limited to (1) a written interpretation from the Architect, (2) an order by the Owner to stop the Work where the Contractor was not at fault, (3) a written order for a minor change in the Work issued by the Architect, (4) failure of payment by the Owner, (5) termination of the Contract by the Owner, (6) Owner's suspension or (7) other reasonable grounds, Claim shall be filed in accordance with this Paragraph 4.3.

4.3.7 Claims for Additional Time

4.3.7.1 If the Contractor wishes to make Claim for an increase in the Contract Time, written notice as provided herein shall be given. The Contractor's Claim shall include an estimate of cost and of probable effect of delay on progress of the Work. In the case of a continuing delay only one Claim is necessary.

4.3.7.2 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated and had an adverse effect on the scheduled construction.

4.3.8 Injury or Damage to Person or Property. If either party to the Contract suffers injury or damage to person or property because of an act or omission of the other party, or of others for whose acts such party is legally responsible, written notice of such injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding 21 days after discovery. The notice shall provide sufficient detail to enable the other party to investigate the matter.

4.3.9 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed in a proposed Change Order or Construction Change Directive so 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.

4.3.10 Claims for Consequential Damages. The Contractor and Owner waive Claims against each other for consequential damages arising out of or relating to this Contract. This mutual waiver includes:

- .1 damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and
- .2 damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit except anticipated profit arising directly from the Work.

This mutual waiver is applicable, without limitation, to all consequential damages due to either party's termination in accordance with Article 14. Nothing contained in this Subparagraph 4.3.10 shall be deemed to preclude an award of liquidated direct damages, when applicable, in accordance with the requirements of the Contract Documents.

4.4 RESOLUTION OF CLAIMS AND DISPUTES

4.4.1 Decision of Architect. Claims, including those alleging an error or omission by the Architect but excluding those arising under Paragraphs 10.3 through 10.5, shall be referred initially to the Architect for decision. An initial decision by the Architect shall be required as a condition precedent to mediation, arbitration or litigation of all Claims between the Contractor and Owner arising prior to the date final payment is due, unless 30 days have passed after the Claim has been referred to the Architect with no decision having been rendered by the Architect. The Architect will not decide disputes between the Contractor

and persons or entities other than the Owner.

4.4.2 The Architect will review Claims and within ten days of the receipt of the Claim take one or more of the following actions: (1) request additional supporting data from the claimant or a response with supporting data from the other party, (2) reject the Claim in whole or in part, (3) approve the Claim, (4) suggest a compromise, or (5) advise the parties that the Architect is unable to resolve the Claim if the Architect lacks sufficient information to evaluate the merits of the Claim or if the Architect concludes that, in the Architect's sole discretion, it would be inappropriate for the Architect to resolve the Claim.

4.4.3 In evaluating Claims, the Architect may, but shall not be obligated to, consult with or seek information from either party or from persons with special knowledge or expertise who may assist the Architect in rendering a decision. The Architect may request the Owner to authorize retention of such persons at the Owner's expense.

4.4.4 If the Architect requests a party to provide a response to a Claim or to furnish additional supporting data, such party shall respond, within ten days after receipt of such request, and shall either provide a response on the requested supporting data, advise the Architect when the response or supporting data will be furnished or advise the Architect that no supporting data will be furnished. Upon receipt of the response or supporting data, if any, the Architect will either reject or approve the Claim in whole or in part.

4.4.5 The Architect will approve or reject Claims by written decision, which shall state the reasons therefor and which shall notify the parties of any change in the Contract Sum or Contract Time or both. The approval or rejection of a Claim by the Architect shall be final and binding on the parties but subject to mediation and arbitration.

4.4.6 When a written decision of the Architect states that (1) the decision is final but subject to mediation and 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.

4.4.7 Upon receipt of a Claim against the Contractor or at any time thereafter, the Architect or the Owner may, but is not obligated to, notify the surety, if any, of the nature and amount of the Claim. If the Claim relates to a possibility of a Contractor's default, the Architect or the Owner may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.

4.4.8 If a Claim relates to or is the subject of a mechanic's lien, the party asserting such Claim may proceed in accordance with applicable law to comply with the lien notice or filing deadlines prior to resolution of the Claim by the Architect, by mediation or by arbitration.

4.5 MEDIATION

4.5.1 Any Claim arising out of or related to the Contract, except Claims relating to aesthetic effect and except those waived as provided for in Subparagraphs 4.3.10, 9.10.4 and 9.10.5 shall, after initial decision by the Architect or 30 days after submission of the Claim to the Architect, be subject to mediation as a condition precedent to arbitration or the institution of legal or equitable proceedings by either party.

4.5.2 The parties shall endeavor to resolve their Claims by mediation which, unless the parties mutually agree otherwise, shall be in accordance with the Construction Industry Mediation Rules of the American Arbitration Association currently in effect. Request for mediation shall be filed in writing with the other party to the Contract and with the American Arbitration Association. The request may be made concurrently with the filing of a demand for arbitration but, in such event, mediation shall proceed in advance of arbitration or legal or equitable proceedings, which shall be stayed pending mediation for a period of 60 days from the date of filing, unless stayed for a longer period by agreement of the parties or court order.

4.5.3 The parties shall share the mediator's fee and any filing fees equally. The mediation shall be held in the place where the Project is located, unless another location is mutually agreed upon. Agreements reached in mediation shall be enforceable as

settlement agreements in any court having jurisdiction thereof.

4.6 ARBITRATION

4.6.1 Any Claim arising out of or related to the Contract, except Claims relating to aesthetic effect and except those waived as provided for in Subparagraphs 4.3.10, 9.10.4 and 9.10.5, shall, after decision by the Architect or 30 days after submission of the Claim to the Architect, be subject to arbitration. Prior to arbitration, the parties shall endeavor to resolve disputes by mediation in accordance with the provisions of Paragraph 4.5.

4.6.2 Claims not resolved by mediation shall be decided by arbitration which, unless the parties mutually agree otherwise, shall be in accordance with the Construction Industry Arbitration Rules of the American Arbitration Association currently in effect. The demand for arbitration shall be filed in writing with the other party to the Contract and with the American Arbitration Association, and a copy shall be filed with the Architect.

4.6.3 A demand for arbitration shall be made within the time limits specified in Subparagraphs 4.4.6 and 4.6.1 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.

4.6.4 **Limitation on Consolidation or Joinder.** No arbitration arising out of or relating to the Contract 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 Claim 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.

4.6.5 **Claims and Timely Assertion of Claims.** The party filing 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.

4.6.6 **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. If the proposed but rejected Subcontractor was reasonably capable of performing the Work, the Contract Sum and Contract Time shall be increased or decreased by the difference, if any, occasioned by such change, and an appropriate Change Order shall be issued before commencement of the substitute Subcontractor's Work. However, no increase in the Contract Sum or Contract Time 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 substitute.

5.3 SUBCONTRACTUAL RELATIONS

5.3.1 By appropriate agreement, written where legally required for validity, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including the responsibility for safety of the Subcontractor's Work, which the Contractor, by these Documents, assumes toward the Owner and Architect. Each subcontract agreement shall preserve and protect the rights of the Owner and Architect under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the subcontract agreement, the benefit of all rights, remedies and redress against the Contractor that the Contractor, by the Contract Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement which may be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

5.4 CONTINGENT ASSIGNMENT OF SUBCONTRACTS

5.4.1 Each subcontract agreement for a portion of the Work is assigned by the Contractor to the Owner provided that:

- .1 assignment is effective only after termination of the Contract by the Owner for cause pursuant to Paragraph 14.2 and only for those subcontract agreements which the Owner accepts by notifying the Subcontractor and Contractor in writing; and
- .2 assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.

5.4.2 Upon such assignment, if the Work has been suspended for more than 30 days, the Subcontractor's compensation shall be equitably adjusted for increases in cost resulting from the suspension.

ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

6.1 OWNER'S RIGHT TO PERFORM CONSTRUCTION AND TO AWARD SEPARATE CONTRACTS

6.1.1 The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and to award separate contracts in connection with other portions of the Project or other construction or operations on the site under Conditions of the Contract identical or substantially similar to these including those portions related to insurance and waiver of subrogation. If the Contractor claims that delay or additional cost is involved because of such action by the Owner, the

Contractor shall make such Claim as provided in Paragraph 4.3.

6.1.2 When separate contracts are awarded for different portions of the Project or other construction or operations on the site, the term "Contractor" in the Contract Documents in each case shall mean the Contractor who executes each separate Owner-Contractor Agreement.

6.1.3 The Owner shall provide for coordination of the activities of the Owner's own forces and of each separate contractor with the Work of the Contractor, who shall cooperate with them. The Contractor shall participate with other separate contractors and the Owner in reviewing their construction schedules when directed to do so. The Contractor shall make any revisions to the construction schedule deemed necessary after a joint review and mutual agreement. The construction schedules shall then constitute the schedules to be used by the Contractor, separate contractors and the Other until subsequently revised.

6.1.4 Unless otherwise provided in the Contract Documents, when the Owner performs construction or operations related to the Project with the Owner's own forces, the Owner shall be deemed to be subject to the same obligations and to have the same rights which apply to the Contractor under the Conditions of the Contract, including, without excluding others, those stated in Article 3, this Article 6 and Articles 10, 11 and 12.

6.2 MUTUAL RESPONSIBILITY

6.2.1 The Contractor shall afford the Owner and separate contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities, and shall connect and coordinate the Contractor's construction and operations with theirs as required by the Contract Documents.

6.2.2 If part of the Contractor's Work depends for proper execution or results upon construction or operations by the Owner or a separate contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly report to the Architect apparent discrepancies or defects in such other construction that would render it unsuitable for such proper execution and results. Failure of the Contractor so to report shall constitute an acknowledgment that the Owner's or separate contractor's completed or partially completed construction is fit and proper to receive the Contractor's Work, except as to defects not then reasonably discoverable.

6.2.3 The Owner shall be reimbursed by the Contractor for costs incurred by the Owner which are payable to a separate contractor because of delays, improperly timed activities or defective construction of the Contractor. The Owner shall be responsible to the Contractor for costs incurred by the Contractor because of delays, improperly timed activities, damage to the Work or defective construction of a separate contractor.

6.2.4 The Contractor shall promptly remedy damage wrongfully caused by the Contractor to completed or partially completed construction or to property of the Owner or separate contractors as provided in Subparagraph 10.2.5.

6.2.5 The Owner and each separate contractor shall have the same responsibilities for cutting and patching as are described for the Contractor in Subparagraph 3.14.

6.3 OWNER'S RIGHT TO CLEAN UP

6.3.1 If a dispute arises among the Contractor, separate contractors and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and the Architect will allocate the cost among those responsible.

ARTICLE 7 CHANGES IN THE WORK

7.1 GENERAL

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.

7.2 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 change in the Work;
- .2 the amount of the adjustment, if any, in the Contract Sum; and
- .3 the extent of the adjustment, if any, in the Contract Time.

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 prior to agreement on 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' 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 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 Pending final determination of the total cost of a Construction Change Directive to the Owner, amounts not in dispute for such changes in the Work shall be included in Applications for Payment accompanied by a Change Order indicating the parties' agreement with part or all of such costs. For any portion of such cost that remains in dispute, the Architect will make an interim determination for purposes of monthly certification for payment for those costs. That determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of either party to disagree and assert a claim in accordance with Article 4.

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.

7.4 MINOR CHANGES IN THE WORK

7.4.1 The Architect will have authority to order minor changes in the Work not involving adjustment in the Contract Sum or extension of the Contract Time and not inconsistent with the intent of the Contract Documents. Such changes shall be effected by written order and shall be binding on the Owner and Contractor. The Contractor shall carry out such written orders promptly.

ARTICLE 8 TIME

8.1 DEFINITIONS

8.1.1 Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Substantial Completion of the Work.

8.1.2 The date of commencement of the Work is the date established in the Agreement.

8.1.3 The date of Substantial Completion is the date certified by the Architect in accordance with Paragraph 9.8.

8.1.4 The term "day" as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.

8.2 PROGRESS AND COMPLETION

8.2.1 Time limits stated in the Contract Documents are of the essence of the Contract. By executing the Agreement the

Contractor confirms that the Contract Time is a reasonable period for performing the Work.

8.2.2 The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, prematurely commence operations on the site or elsewhere prior to the effective date of insurance required by Article 11 to be furnished by the Contractor and Owner. The date of commencement of the Work shall not be changed by the effective date of such insurance. Unless the date of commencement is established by the Contract Documents or a notice to proceed given by the Owner, the Contractor shall notify the Owner in writing not less than five days or other agreed period before commencing the Work to permit the timely filing of mortgages, mechanic's liens and other security interests.

8.2.3 The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time.

8.3 DELAYS AND EXTENSIONS OF TIME

8.3.1 If the Contractor is delayed at any time in the commencement or progress of the Work by an act or neglect of the Owner or Architect, or of an employee of either, or of a separate contractor employed by the Owner, or by changes ordered in the Work, or by labor disputes, fire, unusual delay in deliveries, unavoidable casualties or other causes beyond the Contractor's control, or by delay authorized by the Owner pending mediation and arbitration, or by other causes which the Architect determines may justify delay, then the Contract Time shall be extended by Change Order for such reasonable time as the Architect may determine.

8.3.2 Claims relating to time shall be made in accordance with applicable provisions of Paragraph 4.3.

8.3.3 This Paragraph 8.3 does not preclude recovery of damages for delay by either party under other provisions of the Contract Documents.

ARTICLE 9 PAYMENTS AND COMPLETION

9.1 CONTRACT SUM

9.1.1 The Contract Sum is stated in the Agreement and, including authorized adjustments, is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents.

9.2 SCHEDULE OF VALUES

9.2.1 Before the first Application for Payment, the Contractor shall submit to the Architect a schedule of values allocated to various portions of the Work, prepared in such form and supported by such data to substantiate its accuracy as the Architect may require. This schedule, unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment.

9.3 APPLICATIONS FOR PAYMENT

9.3.1 At least ten days before the date established for each progress payment, the Contractor shall submit to the Architect an itemized Application for Payment for operations completed in accordance with the schedule of values. Such application shall be notarized, if required, and supported by such data substantiating the Contractor's right to payment as the Owner or Architect may require, such as copies of requisitions from Subcontractors and material suppliers, and reflecting retainage if provided for in the Contract Documents.

9.3.1.1 As provided in Subparagraph 7.3.8, such applications may include requests for payment on account of changes in the Work which have been properly authorized by Construction Change Directives, or by interim determinations of the Architect, but not yet included in Change Orders.

9.3.1.2 Such applications may not include requests for payment for portions of the Work for which the Contractor does not intend to pay to a Subcontractor or material supplier, unless such Work has been performed by others whom the Contractor intends to pay.

9.3.2 Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment

delivered and suitably stored at the site for subsequent incorporation in the Work. If approved in advance by the Owner, payment may similarly be made for materials and equipment suitably stored off the site at a location agreed upon in writing. Payment for materials and equipment stored on or off the site shall be conditioned upon compliance by the Contractor with procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest, and shall include the costs of applicable insurance, storage and transportation to the site for such materials and equipment stored off the site.

9.3.3 The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall, to the best of the Contractor's knowledge, information and belief, be free and clear of liens, claims, security interests or encumbrances in favor of the Contractor, Subcontractors, material suppliers, or other persons or entities making a claim by reason of having provided labor, materials and equipment relating to the Work.

9.4 CERTIFICATES FOR PAYMENT

9.4.1 The Architect will, within seven days after receipt of the Contractor's Application for Payment, either issue to the 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 evaluation of the Work 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, the 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 correction of minor deviations from the Contract Documents 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 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 withhold a Certificate for Payment or, because of subsequently discovered evidence, 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 for which the Contractor is responsible, including loss resulting from acts and omissions described in Subparagraph 3.3.2, because of:

- .1 defective Work not remedied;
- .2 third party claims filed or reasonable evidence indicating probable filing of such claims unless security acceptable to the Owner is provided by the Contractor;
- .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 a 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.

9.6.7 Unless the Contractor provides the Owner with a payment bond in the full penal sum of the Contract Sum, payments received by the Contractor for Work properly performed by Subcontractors and suppliers shall be held by the Contractor for those Subcontractors or suppliers who performed Work or furnished materials, or both, under contract with the Contractor for which payment was made by the Owner. Nothing contained herein shall require money to be placed in a separate account and not commingled with money of the Contractor, shall create any fiduciary liability or tort liability on the part of the Contractor for breach of trust or shall entitle any person or entity to an award of punitive damages against the Contractor for breach of the requirements of this provision.

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, plus interest as provided for in the Contract Documents.

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 that 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 prior to final payment. 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.

9.8.3 Upon receipt of the Contractor's list, the Architect will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Architect's inspection discloses any item, whether or not included on the Contractor's list, which is not sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work or designated portion thereof for its intended use, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Architect. In such case, the Contractor shall then submit a request for another inspection by the Architect to determine Substantial Completion.

9.8.4 When the Work or designated portion thereof is substantially complete, the Architect will prepare a Certificate of Substantial Completion which shall establish the date of Substantial Completion, shall establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance, and shall fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.

9.8.5 The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in such Certificate. Upon such acceptance and consent of surety, if any, the Owner shall make payment of retainage applying to such Work or designated portion thereof. Such payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of the Contract Documents.

9.9 PARTIAL OCCUPANCY OR USE

9.9.1 The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is consented to by the insurer as required under Clause 11.4.1.5 and authorized by public authorities having jurisdiction over the Work. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers a portion substantially complete, the Contractor shall prepare and submit a list to the Architect as provided under Subparagraph 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor or, if no agreement is reached, by decision of the Architect.

9.9.2 Immediately prior to such partial occupancy or use, the Owner, Contractor and Architect shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

9.9.3 Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

9.10 FINAL COMPLETION AND FINAL PAYMENT

9.10.1 Upon receipt of written notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect will promptly make such inspection and, when the Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Architect will promptly issue a final Certificate for Payment stating that to the best of the Architect's knowledge, information and belief, and on the basis of the Architect's on-site visits and inspections, the Work has been completed in accordance with terms and conditions of the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Architect's final Certificate for Payment will constitute a further representation that conditions listed in Subparagraph 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled.

9.10.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect and will not be canceled or allowed to expire until at least 30 days' prior written notice has been given to the Owner, (3) a written statement that the Contractor knows of no substantial reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment and (5), if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts, releases and waivers of liens, claims, security interests or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien. If such lien remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging such lien, including all costs and reasonable attorneys' fees.

9.10.3 If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting final completion, and the Architect so confirms, the Owner shall, upon application by the Contractor and certification by the Architect, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance for Work not fully completed or corrected is less than retainage stipulated in the Contract Documents, and if bonds have been furnished, the written consent of surety to payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Architect prior to certification of such payment. Such payment shall be made under terms and conditions governing final payment, except that it shall not constitute a waiver of claims.

9.10.4 The making of final payment shall constitute a waiver of Claims by the Owner except those arising from:

- .1 liens, Claims, security interests or encumbrances arising out of the Contract and unsettled;
- .2 failure of the Work to comply with the requirements of the Contract Documents; or
- .3 terms of special warranties required by the Contract Documents.

9.10.5 Acceptance of final payment by the Contractor, a Subcontractor or material supplier shall constitute a waiver of claims by that payee except those previously made in writing and identified by that payee as unsettled at the time of final Application for Payment.

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.

10.2 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 HAZARDOUS MATERIALS

10.3.1 If reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and report the condition to the Owner and Architect in writing.

10.3.2 The Owner shall obtain 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. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor and Architect the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of such material or substance or who are to perform the task of removal or safe containment of such material or substance. The Contractor and the Architect will promptly reply to the Owner in writing stating whether or not either has reasonable objection to the persons or entities proposed by the Owner. If either the Contractor or Architect has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor and the Architect have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Contractor. The Contract Time shall be extended appropriately and the Contract Sum shall be increased in the amount of the Contractor's reasonable additional costs of shut-down, delay and start-up, which adjustments shall be accomplished as provided in Article 7.

10.3.3 To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the Contractor, Subcontractors, 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 or substance presents the risk of bodily injury or death as described in Subparagraph 10.3.1 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) and provided that such damage, loss or expense is not due to the sole negligence of a party seeking indemnity.

10.4 The Owner shall not be responsible under Paragraph 10.3 for materials and substances brought to the site by the Contractor unless such materials or substances were required by the Contract Documents.

10.5 If, without negligence on the part of the Contractor, the Contractor is held liable for the cost of remediation of a hazardous material or substance solely by reason of performing Work as required by the Contract Documents, the Owner shall indemnify the Contractor for all cost and expense thereby incurred.

10.6 EMERGENCIES

10.6.1 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' compensation, disability benefit and other similar employee benefit acts which are applicable to the Work to be performed;
- .2 claims for damages because of bodily injury, occupational sickness or disease, or death of the Contractor's employees;
- .3 claims for damages because of bodily injury, sickness or disease, or death of any person other than the Contractor's employees;
- .4 claims for damages insured by usual personal injury liability coverage;
- .5 claims for damages, other than to the Work itself, because of injury to or destruction of tangible property, including loss of use resulting therefrom;
- .6 claims for damages because of bodily injury, death of a person or property damage arising out of ownership, maintenance or use of a motor vehicle;
- .7 - claims for bodily injury or property damage arising out of completed operations; and
- .8 claims involving contractual liability insurance applicable to the Contractor's obligations under Paragraph 3.18.

11.1.2 The insurance required by Subparagraph 11.1.1 shall be written for not less than limits of liability specified in the Contract Documents or required by law, whichever coverage is greater. Coverages, whether written on an occurrence or claims-made basis, shall be maintained without interruption from date of commencement of the Work until date of final payment and termination of any coverage required to be maintained after final payment.

11.1.3 Certificates of insurance acceptable to the Owner shall be filed with the Owner prior to commencement of the Work. These certificates and the insurance policies required by this Paragraph 11.1 shall contain a provision that coverages afforded under the policies will not be canceled or allowed to expire until at least 30 days' prior written notice has been given to the Owner. If any of the foregoing insurance coverages are required to remain in force after final payment and are reasonably available, an additional certificate evidencing continuation of such coverage shall be submitted with the final Application for

Payment as required by Subparagraph 9.10.2. Information concerning reduction of coverage on account of revised limits or claims paid under the General Aggregate, or both, shall be furnished by the Contractor with reasonable promptness in accordance with the Contractor's information and belief.

11.2 OWNER'S LIABILITY INSURANCE

11.2.1 The Owner shall be responsible for purchasing and maintaining the Owner's usual liability insurance.

11.3 PROJECT MANAGEMENT PROTECTIVE LIABILITY INSURANCE

11.3.1 Optionally, the Owner may require the Contractor to purchase and maintain Project Management Protective Liability insurance from the Contractor's usual sources as primary coverage for the Owner's, Contractor's and Architect's vicarious liability for construction operations under the Contract. Unless otherwise required by the Contract Documents, the Owner shall reimburse the Contractor by increasing the Contract Sum to pay the cost of purchasing and maintaining such optional insurance coverage, and the Contractor shall not be responsible for purchasing any other liability insurance on behalf of the Owner. The minimum limits of liability purchased with such coverage shall be equal to the aggregate of the limits required for Contractor's Liability Insurance under Clauses 11.1.1.2 through 11.1.1.5.

11.3.2 To the extent damages are covered by Project Management Protective Liability insurance, the Owner, Contractor and Architect waive all rights against each other for damages, except such rights as they may have to the proceeds of such insurance. The policy shall provide for such waivers of subrogation by endorsement or otherwise.

11.3.3 The Owner shall not require the Contractor to include the Owner, Architect or other persons or entities as additional insureds on the Contractor's Liability Insurance coverage under Paragraph 11.1.

11.4 PROPERTY INSURANCE

11.4.1 Unless otherwise provided, the Owner shall purchase and maintain, in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located, property insurance written on a builder's risk "all-risk" or equivalent policy form in the amount of the initial Contract Sum, plus value of subsequent Contract modifications and cost of materials supplied or installed by others, comprising total value for the entire Project at the site on a replacement cost basis without optional deductibles. Such property insurance shall be maintained, unless otherwise provided in the Contract Documents or otherwise agreed in writing by all persons and entities who are beneficiaries of such insurance, until final payment has been made as provided in Paragraph 9.10 or until no person or entity other than the Owner has an insurable interest in the property required by this Paragraph 11.4 to be covered, whichever is later. This insurance shall include interests of the Owner, the Contractor, Subcontractors and Sub-subcontractors in the Project.

11.4.1.1 Property insurance shall be on an "all-risk" or equivalent policy form and shall include, without limitation, insurance against the perils of fire (with extended coverage) and physical loss or damage including, without duplication of coverage, theft, vandalism, malicious mischief, collapse, earthquake, flood, windstorm, falsework, testing and startup, temporary buildings and debris removal including demolition occasioned by enforcement of any applicable legal requirements, and shall cover reasonable compensation for Architect's and Contractor's services and expenses required as a result of such insured loss.

11.4.1.2 If the Owner does not intend to purchase such property insurance required by the Contract and with all of the coverages in the amount described above, the Owner shall so inform the Contractor in writing prior to commencement of the Work. The Contractor may then effect insurance which will protect the interests of the Contractor, Subcontractors and Sub-subcontractors in the Work, and by appropriate Change Order the cost thereof shall be charged to the Owner. If the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain insurance as described above, without so notifying the Contractor in writing, then the Owner shall bear all reasonable costs properly attributable thereto.

11.4.1.3 If the property insurance requires deductibles, the Owner shall pay costs not covered because of such deductibles.

11.4.1.4 This property insurance shall cover portions of the Work stored off the site, and also portions of the Work in transit.

11.4.1.5 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.

11.4.2 **Boiler and Machinery Insurance.** The Owner shall purchase and maintain boiler and machinery insurance required by the Contract Documents or by law, which shall specifically cover such insured objects during installation and until final acceptance by the Owner; this insurance shall include interests of the Owner, Contractor, Subcontractors and Sub-subcontractors in the Work, and the Owner and Contractor shall be named insureds.

11.4.3 **Loss of Use Insurance.** The Owner, at the Owner's option, may purchase and maintain such insurance as will insure the Owner against loss of use of the Owner's property due to fire or other hazards, however caused. The Owner waives all rights of action against the Contractor for loss of use of the Owner's property, including consequential losses due to fire or other hazards however caused.

11.4.4 If the Contractor requests in writing that insurance for risks other than those described herein or other special causes of loss be included in the property insurance policy, the Owner shall, if possible, include such insurance, and the cost thereof shall be charged to the Contractor by appropriate Change Order.

11.4.5 If during the Project construction period the Owner insures properties, real or personal or both, at 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 11.4.7 for damages caused by fire or other causes of loss covered by this separate property insurance. All separate policies shall provide this waiver of subrogation by endorsement or otherwise.

11.4.6 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 11.4. 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 canceled or allowed to expire, and that its limits will not be reduced, until at least 30 days' prior written notice has been given to the Contractor.

11.4.7 **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 causes of loss to the extent covered by property insurance obtained pursuant to this Paragraph 11.4 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.

11.4.8 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 11.4.10. 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.

11.4.9 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 4.6. If after such loss no other special agreement is made and unless the Owner terminates the Contract for convenience, replacement of damaged property shall be performed by the Contractor after notification of a Change in the Work in accordance with Article 7.

11.4.10 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 is made, the dispute shall be resolved as provided in Paragraphs 4.5 and 4.6. The Owner as fiduciary shall, in the case of arbitration, make settlement with insurers in accordance with directions of the arbitrators. If distribution of insurance proceeds by arbitration is required, the arbitrators will direct such distribution.

11.5 PERFORMANCE BOND AND PAYMENT BOND

11.5.1 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.

11.5.2 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 examination 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 examine 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 at the Owner's expense. If such Work is not in accordance with the Contract Documents, correction shall be at the Contractor's expense 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 BEFORE OR AFTER SUBSTANTIAL COMPLETION

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

12.2.2 AFTER SUBSTANTIAL COMPLETION

12.2.2.1 In addition to the Contractor's obligations under Paragraph 3.5, if, within one year after the date of Substantial Completion of the Work or designated portion thereof or after the date for commencement of warranties established under Subparagraph 9.9.1, or by terms of an applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of written notice from the Owner to do so unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty. If the Contractor fails to correct nonconforming Work within a reasonable time during that period after receipt of notice from the Owner or Architect, the Owner may correct it in accordance with Paragraph 2.4.

12.2.2.2 The one-year period for correction of Work shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual performance of the Work.

12.2.2.3 The one-year period for correction of Work shall not be extended by corrective Work performed by the Contractor pursuant to this Paragraph 12.2.

12.2.3 The Contractor shall remove from the site portions of the Work which are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.

12.2.4 The Contractor shall bear the cost of correcting destroyed or damaged construction, whether completed or partially completed, of the Owner or separate contractors caused by the Contractor's correction or removal of Work which is not in accordance with the requirements of the Contract Documents.

12.2.5 Nothing contained in this Paragraph 12.2 shall be construed to establish a period of limitation with respect to other obligations which the Contractor might have under the Contract Documents. Establishment of the one-year period for correction of Work as described in Subparagraph 12.2.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

12.3 ACCEPTANCE OF NONCONFORMING WORK

12.3.1 If the Owner prefers to accept Work which is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

ARTICLE 13 MISCELLANEOUS PROVISIONS

13.1 GOVERNING LAW

13.1.1 The Contract shall be governed by the law of the place where the Project is located.

13.2 SUCCESSORS AND ASSIGNS

13.2.1 The Owner and Contractor respectively bind themselves, their partners, successors, assigns and legal representatives to the other party hereto and to partners, successors, assigns and legal representatives of such other party in respect to covenants, agreements and obligations contained in the Contract Documents. Except as provided in Subparagraph 13.2.2, neither party to the Contract shall assign the Contract as a whole without written consent of the other. If either party attempts to make such an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

13.2.2 The Owner may, without consent of the Contractor, assign the Contract to an institutional lender providing construction financing for the Project. In such event, the lender shall assume the Owner's rights and obligations under the Contract Documents. The Contractor shall execute all consents reasonably required to facilitate such assignment.

13.3 WRITTEN NOTICE

13.3.1 Written notice shall be deemed to have been duly served if delivered in person to the individual or a member of the firm or entity or to an officer of the corporation for which it was intended, or if delivered at or sent by registered or certified mail to the last business address known to the party giving notice.

13.4 RIGHTS AND REMEDIES

13.4.1 Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights and remedies otherwise imposed or available by law.

13.4.2 No action or failure to act by the Owner, Architect or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach thereunder, except as may be specifically agreed in writing.

13.5 TESTS AND INSPECTIONS

13.5.1 Tests, inspections and approvals of portions of the Work required by the Contract Documents or by laws, ordinances, rules, regulations or orders of public authorities having jurisdiction shall be made at an appropriate time. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections and approvals. The Contractor shall give the Architect timely notice of when and where tests and inspections are to be made so that the Architect may be present for such procedures. The Owner shall bear costs of tests, inspections or approvals which do not become requirements until after bids are received or negotiations concluded.

13.5.2 If the Architect, Owner or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection or approval not included under Subparagraph 13.5.1, the Architect will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection or approval by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Architect of when and where tests and inspections are to be made so that the Architect may be present for such procedures. Such costs, except as provided in Subparagraph 13.5.3, shall be at the Owner's expense.

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, all costs made necessary by such failure including those of repeated procedures and compensation for the Architect's services and expenses shall be at the Contractor's expense.

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.

TICLE 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 consecutive days through no act or fault of the Contractor or a Subcontractor, Sub-subcontractor or their agents or employees or any other persons or entities performing portions of the Work under direct or indirect contract with the Contractor, for any of the following reasons:

- .1 issuance of an order of a court or other public authority having jurisdiction which requires all Work to be stopped;
- .2 an act of government, such as a declaration of national emergency which requires all Work to be stopped;
- .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; or
- .4 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 The Contractor may terminate the Contract if, through no act or fault of the Contractor or a Subcontractor, Sub-subcontractor or their agents or employees or any other persons or entities performing portions of the Work under direct or indirect contract with the Contractor, repeated suspensions, delays or interruptions of the entire Work 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.

14.1.3 If one of the reasons described in Subparagraph 14.1.1 or 14.1.2 exists, the Contractor may, upon seven 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.

14.1.4 If the Work is stopped for a period of 60 consecutive 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 14.1.3.

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 justify such action, may without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, seven days' written notice, terminate employment of the Contractor and may, subject to any prior

rights of the surety:

- .1 take possession of the site and of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;
- .2 accept assignment of subcontracts pursuant to Paragraph 5.4; and
- .3 finish the Work by whatever reasonable method the Owner may deem expedient. Upon request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

14.2.3 When the Owner terminates the Contract for one of the reasons stated in Subparagraph 14.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished.

14.2.4 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Architect's services and expenses made necessary thereby, and other damages incurred by the Owner and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The amount to be paid to the Contractor or Owner, as the case may be, shall be certified by the Architect, upon application, and this obligation for payment shall survive termination of the Contract.

14.3 SUSPENSION BY THE OWNER FOR CONVENIENCE

14.3.1 The Owner may, without cause, order the Contractor in writing to suspend, delay or interrupt the Work in whole or in part for such period of time as the Owner may determine.

14.3.2 The Contract Sum and Contract Time shall be adjusted for increases in the cost and time caused by suspension, delay or interruption as described in Subparagraph 14.3.1. Adjustment of the Contract Sum shall include profit. No adjustment shall be made to the extent:

- .1 that performance is, was or would have been so suspended, delayed or interrupted by another cause for which the Contractor is responsible; or
- .2 that an equitable adjustment is made or denied under another provision of the Contract.

14.4 TERMINATION BY THE OWNER FOR CONVENIENCE

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

14.4.2 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 the 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.

14.4.3 In case of such termination for the Owner's convenience, the Contractor shall be entitled to receive payment for Work executed, and costs incurred by reason of such termination, along with reasonable overhead and profit on the Work not executed.

SUPPLEMENTARY GENERAL CONDITIONS

The following supplementary general conditions modify, delete from or supplement the "General Conditions of the Contract for Construction," AIA Document A201, 1997 Edition. Whenever any Article of such General Conditions, or any Paragraph, Subparagraph or Clause thereof, is modified, deleted or supplemented hereby, the provisions of this Article, or of such Paragraph, Subparagraph or Clause, which are not modified or deleted hereby shall remain in effect.

ARTICLE 1 - GENERAL PROVISIONS

Paragraph 1.1 – Basic Definitions

1.1.2

Insert the following after the word "Sub-subcontractor" in the sixth line of Subparagraph 1.1.2:

except as set forth in Paragraph 5.3 and Paragraph 5.4,

1.1.8

Add the following Subparagraph 1.1.8:

1.1.8 Knowledge The terms "knowledge," "recognize," and "discover," their respective derivatives, and similar terms in the Contract Documents, as used in reference to the Contractor, shall be interpreted to mean that which the Contractor knows (or should know), recognizes (or should recognize), and discovers (or should discover) in exercising the care, skill, and diligence required by the Contract Documents. Analogously, the expression "reasonably inferable" and similar terms in the Contract Documents shall be interpreted to mean reasonably inferable by a contractor familiar with the Project and exercising the care, skill, and diligence required of the Contractor by the Contract Documents.

Paragraph 1.2 – Correlation And Intent Of The Contract Documents

1.2.1

Add the following at the end of Subparagraph 1.2.1:

In the event of inconsistencies within or between parts of the Contract Documents, or between the Contract Documents and applicable standards, codes, and ordinances, the Contractor shall (i) provide the better quality or greater quantity of Work or (ii) comply with the more stringent requirement; either or both in accordance with the Owner's interpretation. The terms and conditions of this Subparagraph 1.2.1, however, shall not relieve the Contractor of any of the obligations set forth in Subparagraphs 3.2 and 3.7.

1.2.3

Add the following clauses at the end of Subparagraph 1.2.3:

.1 Whenever a product is specified in accordance with a Federal Specification, an ASTM Standard, an American National Standards Institute Specification, or other Association Standard, the Contractor shall present an affidavit from the manufacturer when requested by the Architect or required in the Specifications, certifying that the product complies with the particular Standard or Specification. When requested by the Architect or specified, support test data shall be submitted to substantiate compliance.

.2 Whenever a product is specified or shown by describing proprietary items, model numbers, catalog numbers, manufacturer, trade names, or similar reference, no substitutions may be made unless accepted prior to execution of the Contract or if accepted as a Change in the Work in accordance with



Subparagraphs 3.4.4 - 3.4.6. Where two or more products are shown or specified, the Contractor has the option to use either of those shown or specified.

Paragraph 1.3 - Capitalization

1.3.1

Insert the following at the end of the first sentence of Subparagraph 1.3.1:
and shall become the property of the Owner as provided in any agreement between the Owner and Architect.

Paragraph 1.5 – Execution Of Contract Documents

1.5.1

Delete Subparagraph 1.5.1 and insert the following:

The contract documents shall be signed by the Contractor and the Owner.

1.5.2

Add the following at the end of Subparagraph 1.5.2:

Prior to the execution of the Agreement, the Contractor and each Subcontractor evaluated and satisfied themselves as the conditions and limitations under which the Work is to be performed, including, without limitation, (i) the location, condition, layout, and nature of the Project site and surrounding areas, (ii) generally prevailing climatic conditions, (iii) anticipated labor supply and costs, (iv) availability and cost of materials, tools, and equipment, and (v) other similar issues. The Owner assumes no responsibility or liability for the physical condition or safety of the Project site or any improvements located on the Project site. Except as set forth in Paragraph 10.3, the Contractor shall be solely responsible for providing a safe place for the performance of the Work. The Owner shall not be required to make any adjustment in either the Contract Sum or the Contract Time in connection with any failure by the Contractor or any Subcontractor to have complied with the requirements of this Subparagraph 1.5.2.

Paragraph 1.7 - Confidentiality

Add the following new Paragraph 1.7:

1.7 Confidentiality

1.7.1 The Contractor warrants and represents that the Contractor shall not knowingly or negligently communicate or disclose at any time to any person or entity any information in connection with the Work or the Project, except (i) with prior written consent of the Owner, (ii) information that was in the public domain prior to the date of this Agreement, (iii) information that becomes part of the public domain by publication or otherwise not due to any unauthorized act or omission of the Contractor, or (iv) as may be required to perform the Work or by any applicable law.

1.7.2 The Contractor, at any time upon the request of the Owner, shall immediately return and surrender to the Owner all copies of any materials, records, notices, memoranda, recordings, drawings, specifications, and mock-ups and any other documents furnished by the Owner or the Architect to the Contractor.

1.7.3 The Contractor shall cause all Subcontractors or any other person or entity performing any services, or furnishing any materials or equipment, for the Work to warrant and represent all items set forth in this Paragraph 1.7.



1.7.4 The representations and warranties contained in this Paragraph 1.7 shall survive the complete performance of the Work or earlier termination of this Agreement.

ARTICLE 2 - OWNER

Paragraph 2.2 – Information And Services Required Of The Owner

2.2.1

Delete Subparagraph 2.2.1, and substitute the following:

Contractor further acknowledges that extensive test borings, soil, hydrological and other studies of the site have been provided to it, and that in the event unforeseen subsurface conditions result, unit prices shall be charged in accordance with the Contractor's bid form.

2.2.5

Replace Subparagraph 2.2.5 in its entirety with the following:

2.2.5 The Contractor will be furnished, free of charge, one (1) Blue-line and one (1) Reproducible copy of the Drawings and one (1) copy of the Specifications. The Contractor will be furnished, at its sole cost and expense, any additional copies.

Paragraph 2.4 – Owner's Right To Carry Out The Work

2.4.1

Delete the fourth through the seventh lines of Subparagraph 2.4.1, beginning with the words "the Owner may after such seven-day period" and ending with the words "commence and continue to correct any deficiencies."

Paragraph 2.5 – Extent Of Owner Rights

Add the following new Paragraph 2.5:

2.5 Extent of Owner Rights

2.5.1 The rights stated in this Article 2 and elsewhere in the Contract Documents are cumulative and not in limitation of any rights of the Owner (i) granted in the Contract Documents, (ii) at law or (iii) in equity.

2.5.2 In no event shall the Owner have control over, charge of, or any responsibility for construction means, methods, techniques, sequences, or procedures or for safety precautions and programs in connection with the Work, notwithstanding any of the rights and authority granted the Owner in the Contract Documents.

ARTICLE 3 – CONTRACTOR

Paragraph 3.2 – Review Of Contract Documents And Field Conditions By Contractor

3.2.1

Insert the words "the design information contained in" after the word "in" in the seventh line of Subparagraph 3.2.1.



3.2.1

Add the following clauses to Subparagraph 3.2.1:

.1 The exactness of grades, elevations, dimensions, or locations given on any Drawings issued by the Architect, or the work installed by other contractors, is not guaranteed by the Architect or the Owner.

.2 The Contractor shall, therefore, satisfy itself as to the accuracy of all grades, elevations, dimensions, and locations. In all cases of interconnection of its Work with existing or other work, it shall verify at the site all dimensions relating to such existing or other work. Any errors due to the Contractor's failure to so verify all such grades, elevations, dimensions, or locations shall be promptly rectified by the Contractor without any additional cost to the Owner.

Paragraph 3.3 – Supervision And Construction Procedures

3.3.1:

Delete the last sentence from Subparagraph 3.3.1.

Add the following Subparagraph at the end of Paragraph 3.3:

3.3.4 The Contractor shall be responsible for locating and layout out his work in three dimensions in accordance with the drawings and with accuracy in establishing and maintaining dimensional control to agree with Owner's established lines and levels.

Paragraph 3.4 – Labor And Materials

Add the following new Subparagraphs at the end of Paragraph 3.4:

3.4.4 The Contractor shall only employ or use labor in connection with the Work capable of working harmoniously with all trades, crafts, and any other individuals associated with the Project. The Contractor shall also use best efforts to minimize the likelihood of any strike, work stoppage, or other labor disturbance.

.1 If the Work is to be performed by trade unions, the Contractor shall make all necessary arrangements to reconcile, without delay, damage, or cost to the Owner and without recourse to the Architect or the Owner; any conflict between the Contract Documents and any agreements or regulations of any kind at any time in force among members or councils that regulate or distinguish the activities that shall not be included in the work of any particular trade.

.2 In case the progress of the Work is affected by any undue delay in furnishing or installing any items or materials or equipment required under the Contract Documents because of such conflict involving any such labor agreement or regulation, the Owner may require that other material or equipment of equal kind and quality be provided pursuant to a Change Order or Construction Change Directive.

3.4.5 If material is other than manufacturer(s) specified then the Architect reserves the right to disapprove any material or equipment on the basis of design or color considerations alone, without prejudice to the quality of the material or equipment, if the manufacturer cannot meet the required colors or design.

3.4.6 Workmanship: Workmanship shall at all times be of a grade expected from skilled mechanics in each trade as determined by the Architect. Fitting of all materials shall be done to preserve the strength and durability of the material and to present a clean, well-worked appearance. Where different materials abut, or where it is necessary to cut or pass through one material with another, care must be taken not to injure, or deface the



Material in placing the other. Various trades shall at all times cooperate in the installation of their work to complete the whole in a satisfactory acceptable manner to the Architect and Owner.

Paragraph 3.5 - Warranty

3.5.1

Replace the word "may" with the word "shall" in the sixth line of Subparagraph 3.5.1.

3.5.2

Add the following new Subparagraph 3.5.2:

3.5.2 The Contractor agrees to assign to the Owner at the time of final completion of the Work any and all manufacturer's warranties relating to materials and labor used in the Work and further agrees to perform the Work in such manner so as to preserve any and all such manufacturer's warranties. At the request of the Owner, specific warranty items may be assigned to the Landlord.

Paragraph 3.6 – Taxes

Add the following new Subparagraph at the end of Paragraph 3.6:

3.6.2 "All out of State Subcontractors and Suppliers shall pay taxes on all materials, supplies and equipment and/or use tax from the State being purchased from."

Paragraph 3.7 – Permits, Fees And Notices

3.7.1

Replace Subparagraph 3.7.1 with the following:

3.7.1 Except as set forth in Subparagraph 2.2.2, the Contractor shall secure, pay for, and, as soon as practicable, furnish the Owner with copies or certificates of all permits and fees, licenses, and inspections necessary for the proper execution and completion of the Work, including, without limitation, all building permits, [insert other similar items]. All connection charges, assessments, or inspection fees as may be imposed by any municipal agency or utility company are included in the Contract Sum and shall be the Contractor's responsibility.

3.7.2

Insert the words "and all other requirements" between the words "orders" and "of" in the second line of Subparagraph 3.7.2.

3.7.2

Add the following language at the end of Subparagraph 3.7.2:

The Contractor shall procure and obtain all bonds required of the Owner or the Contractor by the municipality in which the Project is located or any other public or private body with jurisdiction over the Project. In connection with such bonds, the Contractor shall prepare all applications, supply all necessary backup material, and furnish the surety with any required personal undertakings. The Contractor shall also obtain and pay all charges for all approvals for street closings, parking meter removal, and other similar matters as may be necessary or appropriate from time to time for the performance of the Work.



3.7.3

Insert at the beginning of Subparagraph 3.7.3 the phrase, "Except as provided in Paragraph 3.2.1",.

3.7.3

Add the following at the end of the first sentence in Subparagraph 3.7.3:

unless such laws, statutes, ordinances, building codes, and rules and regulations bear upon the performance of the Work.

3.7.3

In line 3 of Subparagraph 3.7.3 delete the word "promptly" and substitute the words "within 24 hours".

Paragraph 3.9 - Superintendent

3.9.1

Replace Subparagraph 3.9.1 in its entirety with the following:

3.9.1 The Contractor shall keep an authorized supervisory representative on site during all working hours who shall act as the agent of the Contractor. The supervisory representative on the contract work shall be a competent English speaking Superintendent capable of reading and thoroughly understanding the drawings and specifications, with full authority to promptly fulfill the Contractor's duties and responsibilities on the job. The Contractor's supervisory representative shall be subject to the approval of the Owner. The supervisory representative shall not be removed from the work without prior written consent of the Owner. If in the opinion of the Owner or Architect, the supervisory representative or any of his successors, proves incompetent, not conscientious or not industrious, then the Contractor shall replace him within ten (10) calendar days with another person approved by the Owner at no additional cost to the Owner. Approval shall not, in any way, relieve or diminish the Contractor's responsibility for supervision of the work.

Paragraph 3.10 – Contractor's Construction Schedules

3.10.1

In the first line, delete the word "promptly" and insert "within fourteen (14) calendar days of Notice of Award."

Add the following subparagraphs to Paragraph 3.10:

3.10.4 The construction schedule shall be in a detailed precedence-style critical path management ("CPM") or primavera-type format satisfactory to the Owner and the Architect that shall also (i) provide a graphic representation of all activities and events that will occur during performance of the Work; (ii) identify each phase of construction and occupancy; and (iii) set forth dates that are critical in ensuring the timely and orderly completion of the Work in accordance with the requirements of the Contract Documents (hereinafter referred to as "Milestone Dates"). Upon review and acceptance by the Owner and the Architect of the Milestone Dates, the construction schedule shall be deemed part of the Contract Documents and attached to the Agreement as Exhibit . If not accepted, the construction schedule shall be promptly revised by the Contractor in accordance with the recommendations of the Owner and the Architect and resubmitted for acceptance. The Contractor shall monitor the progress of the Work for conformance with the requirements of the construction schedule and shall promptly advise the Owner of any delays or potential delays. The accepted construction schedule shall be updated to reflect actual conditions (sometimes referred to in these Supplementary Conditions as "progress reports") as set forth in Subparagraph 3.10.1 or if requested by either the Owner or the Architect. In the event any progress report indicates any delays, the Contractor shall propose an affirmative plan to correct the delay, including overtime and/or additional labor, if necessary. In no event shall any progress report constitute an



adjustment in the Contract Time, any Milestone Date, or the Contract Sum unless any such adjustment is agreed to by the Owner and authorized pursuant to Change Order.

3.10.5 In the event the Owner determines that the performance of the Work, as of a Milestone Date, has not progressed or reached the level of completion required by the Contract Documents, the Owner shall have the right to order the Contractor to take corrective measures necessary to expedite the progress of construction, including, without limitation, (i) working additional shifts or overtime, (ii) supplying additional manpower, equipment, and facilities, and (iii) other similar measures (hereinafter referred to collectively as "Extraordinary Measures"). Such Extraordinary Measures shall continue until the progress of the Work complies with the stage of completion required by the Contract Documents. The Owner's right to require Extraordinary Measures is solely for the purpose of ensuring the Contractor's compliance with the construction schedule.

.1 The Contractor shall not be entitled to an adjustment in the Contract Sum in connection with Extraordinary Measures required by the Owner under or pursuant to this Subparagraph 3.10.5.

.2 The Owner may exercise the rights furnished the Owner under or pursuant to this Subparagraph 3.10.5 as frequently as the Owner deems necessary to ensure that the Contractor's performance of the Work will comply with any Milestone Date or completion date set forth in the Contract Documents.

3.10.6 The Owner shall have the right to direct a postponement or rescheduling of any date or time for the performance of any part of the Work that may interfere with the operation of the Owner's premises or any tenants or invitees thereof. The Contractor shall, upon the Owner's request, reschedule any portion of the Work affecting operation of the premises during hours when the premises are not in operation. Any postponement, rescheduling, or performance of the Work under this Subparagraph 3.10.6 may be grounds for an extension of the Contract Time, if permitted under Subparagraph 8.3.1, and an equitable adjustment in the Contract Sum if (i) the performance of the Work was properly scheduled by the Contractor in compliance with the requirements of the Contract Documents, and (ii) such rescheduling or postponement is required for the convenience of the Owner.

3.12.10

Insert a period after the word "professionals" in the twelfth line of Subparagraph 3.12.10, and delete the remainder of the sentence.

Paragraph 3.13 – Use Of Site

Add the following subparagraphs to Paragraph 3.13:

3.13.2 Only materials and equipment that are to be used directly in the Work shall be brought to and stored on the Project site by the Contractor. After equipment is no longer required for the Work, it shall be promptly removed from the Project site. Protection of construction materials and equipment stored at the Project site from weather, theft, damage, and all other adversity is solely the responsibility of the Contractor. The Contractor shall ensure that the Work, at all times, is performed in a manner that affords reasonable access, both vehicular and pedestrian, to the site of the Work and all adjacent areas. The Work shall be performed, to the fullest extent reasonably possible, in such a manner that public areas adjacent to the site of the Work shall be free from all debris, building materials, and equipment likely to cause hazardous conditions.

3.13.3 The Contractor and any entity for whom the Contractor is responsible shall not erect any sign on the Project site without the prior written consent of the Owner, which may be withheld in the sole discretion of the Owner.



3.13.4 Without limitation of any other provision of the Contract Documents, the Contractor shall use best efforts to minimize any interference with the occupancy or beneficial use of (i) any areas and buildings adjacent to the site of the Work and (ii) the Building in the event of partial occupancy, as more specifically described in Paragraph 9.9. Without prior approval of the Owner, the Contractor shall not permit any workers to use any existing facilities at the Project site, including, without limitation, lavatories, toilets, entrances, and parking areas other than those designated by the Owner.

.1 Without limitation of any other provision of the Contract Documents, the Contractor shall use its best efforts to comply with all rules and regulations promulgated by the Owner in connection with the use and occupancy of the Project site and the Building, as amended from time to time. The Contractor shall immediately notify the owner in writing if during the performance of the Work, the Contractor finds compliance of any portion of such rules and regulations to be impracticable, setting forth the problems of such compliance and suggesting alternatives through which the same results intended by such portions of the rules and regulations can be achieved. The Owner may, in the Owner's sole discretion, adopt such suggestions, develop new alternatives, or require compliance with the existing requirements of the rules and regulations.

.2 The Contractor shall also comply with all insurance requirements and collective bargaining agreements applicable to use and occupancy of the Project site and the Building.

Paragraph 3.14 – Cutting And Patching

Add the following new Subparagraph at the end of Paragraph 3.14:

3.14.3 The Contractor shall implement a welding/cutting program including required permits, fire extinguisher within twenty feet of work area, and firewatch continuously from start through one hour after completion. All cutting/welding operations shall terminate one hour before daily close of work. Cutting and welding to be performed in or immediately adjacent to existing spaces shall not be performed without prior notification of the Owner for each instance.

Paragraph 3.15 – Cleaning Up

3.15.1

Add the following at the end of Subparagraph 3.15.1:

"Contractor shall also remove all broken or scratched glass and replace it with new glass, remove all paint droppings, spots, stains and dirt caused by the Contractor from finished surfaces, and thoroughly clean all plumbing fixtures, hardware and floors."

Paragraph 3.17 – Royalties, Patents And Copyrights

3.17.1

Add at the end of Paragraph 3.17.1 the words "and Owner".

Paragraph 3.18 - Indemnification

3.18.1

Delete all language beginning with the words "and are not covered" beginning in the second line of Subparagraph 3.18.1 and continuing through the cross-reference to "Paragraph 11.3" in the third line.



Add the following new Subparagraphs 3.18.3 and 3.18.4:

3.18.3 The Contractor's indemnity obligations under this Paragraph 3.18 shall also specifically include, without limitation, all fines, penalties, damages, liability, costs, expenses (including, without limitation, reasonable attorneys' fees), and punitive damages (if any) arising out of, or in connection with, any (i) violation of or failure to comply with any law, statute, ordinance, rule, regulation, code, or requirement of a public authority that bears upon the performance of the Work by the Contractor, a Subcontractor, or any person or entity for whom either is responsible, (ii) means, methods, procedures, techniques, or sequences of execution or performance of the Work, and (iii) failure to secure and pay for permits, fees, approvals, licenses, and inspections as required under the Contract Documents, or any violation of any permit or other approval of a public authority applicable to the Work, by the Contractor, a Subcontractor, or any person or entity for whom either is responsible.

3.18.4 The Contractor shall indemnify and hold harmless all of the Indemnitees from and against any costs and expenses (including reasonable attorneys' fees) incurred by any of the Indemnitees in enforcing any of the Contractor's defense, indemnity, and hold-harmless obligations under this Contract.

ARTICLE 4 – ADMINISTRATION OF THE CONTRACT

Paragraph 4.1 - Architect

4.1.1

Add the following at the end of Subparagraph 4.1.1:

Any reference in the Contract Documents to the Architect's taking action or rendering a decision within a "reasonable time" is understood to mean no more than two (2) weeks.

Paragraph 4.2 – Architect's Administration Of The Contract

4.2.7

Delete from the second sentence of Subparagraph 4.2.7 the phrase "with such reasonable promptness ... to permit adequate review" and insert in place thereof the phrase "within ten (10) calendar days of receipt of Contractor submittal".

4.2.8

Delete from the first line of Subparagraph 4.2.8 the word "Architect" and insert in place thereof the word "Owner".

4.2.9

Delete all words following "of final completion".

4.2.11

Delete from the second sentence of Subparagraph 4.2.11 the phrase "within any time limits agreed upon or otherwise with reasonable promptness" and insert in place thereof the phrase "within seven (7) calendar days".

4.2.13

Insert the words ", in connection with administration of the Contract," after the word "effect," in the first line of Subparagraph 4.2.13.



Paragraph 4.3 – Claims And Disputes

4.3.2

Add in the first sentence of Subparagraph 4.3.2 the words "arising before application for Final Payment" after the word "claims".

4.3.2

Add the following at the end of the first sentence in Subparagraph 4.3.2:

; provided, however, that the claimant shall use its best efforts to furnish the Architect and the other party, as expeditiously as possible, with notice of any Claim including, without limitation, those in connection with concealed or unknown conditions, once such claim is recognized, and shall cooperate with the Architect and the party against whom the claim is made in any effort to mitigate the alleged or potential damages, delay, or other adverse consequences arising out of the condition that is the cause of such a claim.

4.3.2

Add the following at the end of Subparagraph 4.3.2:

Claims may also be reserved in writing within the time limits set forth in this Subparagraph 4.3.2. If a Claim is reserved, the Resolution of Claims and Disputes procedures described in Paragraph 4.4 shall not commence until written notice from the claimant is received by the Architect. Any notice of Claim or reservation of Claim must clearly identify the alleged cause and the nature of the Claim and include data and information then available to the claimant that will facilitate prompt verification and evaluation of the Claim.

4.3.4

Add the following at the end of Subparagraph 4.3.4:

No adjustment in the Contract Time or Contract Sum shall be permitted, however, in connection with a concealed or unknown condition that does not differ materially from those conditions disclosed or that reasonably should have been disclosed by the Contractor's (i) prior inspections, tests, reviews, and preconstruction services for the Project, or (ii) inspections, tests, reviews, and preconstruction services that the Contractor had the opportunity to make or should have performed in connection with the Project.

4.3.10

Delete Subparagraph 4.3.10 in its entirety.

Paragraph 4.4 – Resolution Of Claims And Disputes

4.4.1

Add the following at the end of the first sentence in Subparagraph 4.4.1:

if the claimant first recognizes the claim prior to the date of final payment.

Paragraph 4.5 - Mediation

4.5.3

Add the following at the end of Subparagraph 4.5.3:

In no event shall any mediator in connection with a Claim be permitted to serve as an arbitrator for that, or any other, Claim that is not resolved pursuant to mediation.



Paragraph 4.6 - Arbitration

Delete Paragraph 4.6 in its entirety and insert in place thereof:

All references herein to arbitration shall be construed to mean litigation in a court of competent jurisdiction in Boston, Massachusetts.

ARTICLE 5 – SUBCONTRACTORS

Paragraph 5.2 – Award Of Subcontracts And Other Contracts For Portions Of The Work

5.2.1

In the first sentence, replace "as soon as practical" with "within twenty-one (21) days".

Paragraph 5.3 – Subcontractual Relations

5.3.1

Insert in the first sentence of Subparagraph 5.3.1 between the words "appropriate" and "agreement" the word "written" and delete therefrom the words "written where legally required for validity".

5.3.1

Add the following at the end of Subparagraph 5.3.1:

"Furthermore, in the event of a default, all contracts will be assigned to the Owner at Owner's request."

Add the following new Subparagraph at the end of Paragraph 5.3:

5.3.2 The Contractor shall require that each Subcontractor agree by his Subcontract to be joined in any arbitration or litigation proceedings involving the Owner, the Contractor, the Architect, or any of them, relating to any Work covered by his subcontract, at the election of either the Owner or the Contractor. The Contractor shall require each Subcontractor to include a similar provision in his Sub-Subcontracts. If union and non-union workers are employed to perform any part of the Work, the Contractor shall establish and maintain separate entrances to the Project site for the use of union and non-union workers.

The Contractor shall procure materials from such sources and shall manage his own forces and the forces of his Subcontractors and Sub-Subcontractors in such a manner as will result in harmonious relations on the job

site. The Contractor shall employ, and shall require his Subcontractors to employ, men and mechanics on the Work who will at all times work in harmony with others engaged in the Work. Should the Work for any reason be stopped or materially delayed, in the reasonable judgement of the Owner, due to a labor dispute involving the employees of, or directed at, any Subcontractor or any of his Sub-Subcontractors, the Owner shall have the right to require the Contractor to substitute a Subcontractor acceptable to the Owner the added cost for which, if any, will be borne by the Owner.

The Owner shall have the right to review and approve all Subcontracts to ensure compliance with the provisions of this Subparagraph before execution thereof. Nothing in this Subparagraph shall create any third-party beneficiary relationship between the Owner and any Subcontractor. The Contractor shall forward to the Owner true and complete copies of all Subcontracts and Sub-Subcontracts immediately upon execution.



Paragraph 5.4 – Contingent Assignment Of Subcontracts

5.4.2

Replace 5.4.2 in its entirety with the following:

If the Work in connection with a subcontract has been suspended for more than thirty (30) days after termination of the Contract by the Owner pursuant to Paragraph 14.2 and the Owner accepts assignment of such subcontract, the Subcontractor's compensation shall be equitably adjusted for any increase in direct costs incurred by such Subcontractor as a result of the suspension.

Add the following new Subparagraph 5.4.3:

5.4.3 Each subcontract shall specifically provide that the Owner shall only be responsible to the Subcontractor for those obligations of the Contractor that accrue subsequent to the Owner's exercise of any rights under this conditional assignment.

ARTICLE 6 – CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

Paragraph 6.1 – Owner's Right To Perform Construction And To Award Separate Contracts

6.1.3

Insert after the first word of the third sentence of Subparagraph 6.1.3 the words "Owner, the separate contractor and the".

Add the following new Subparagraph 6.1.5:

6.1.5 The Contractor accepts assignment of, and liability for, all purchase orders and other agreements for procurement of materials and equipment that are identified as part of the Contract Documents. The Contractor shall be responsible for such prepurchased items, if any, as if the Contractor were the original purchaser. The Contract Sum includes, without limitation, all costs and expenses in connection with delivery, storage, insurance, installation, and testing of items covered in any assigned purchase orders or agreements.

All warranty and correction of the Work obligations under the Contract Documents shall also apply to any prepurchased items, unless the Contract Documents specifically provide otherwise.

Paragraph 6.2 – Mutual Responsibility

6.2.2

Insert in the first sentence of Subparagraph 6.2.2 after the word "Architect" the words "and the Owner"; and between the words "construction" and "that" the words "discoverable as a result of prudent examination, testing and observation of such construction by the Contractor or otherwise". At the end of the second sentence, delete the phrase "not then reasonably discoverable" and insert in place thereof the phrase "not so discoverable".

6.2.5

Insert at the beginning of Subparagraph 6.2.5 the words "With respect to the relationship of any construction performed by Owner or any separate contractor to the Work,".



ARTICLE 7 – CHANGES IN THE WORK

Paragraph 7.1 - General

7.1.2

Insert in Subparagraph 7.1.2 between the words "Work" and "may" the words "not involving a change in the Contract Sum or a rising Substantial Completion Date".

7.1.2

Add the following at the end of Subparagraph 7.1.2:

No Change Order involving an adjustment in the Contract Sum or an extension of the Contract Time shall in any event be issued except with the written approval of the Owner, and the Contractor shall not be entitled to reimbursement for increased costs resulting from any change in the Work made at the request of the Architect, or any prospective tenant or any other party unless so approved by the Owner in writing.

7.1.3

Add the following at the end of Subparagraph 7.1.3:

Except as permitted in Paragraph 7.3 and Subparagraph 9.7.2, a change in the Contract Sum or the Contract Time shall be accomplished only by Change Order. Accordingly, no course of conduct or dealings between the parties, nor express or implied acceptance of alternations or additions to the Work, and no claim that Owner has been unjustly enriched by any alteration of or addition to the Work, whether or not there is, in fact, any unjust enrichment to the Work, shall be the basis of any claim to an increase in any amounts due under the Contract Documents or a change in any time period provided for in the Contract Documents.

Paragraph 7.2 – Change Orders

7.2.1

Delete from the first line of Subparagraph 7.2.1 the word "Architect" and insert in place thereof the word "Owner".

Replace "Owner, Contractor and Architect," with "Owner and Contractor,".

Add the following new Subparagraph 7.2.3:

7.2.3 Agreement on any Change Order shall constitute a final settlement of all matters relating to the change in the Work that is the subject of the Change Order, including, but not limited to, all direct and indirect costs associated with such change and any and all adjustments to the Contract Sum and the construction schedule.

Paragraph 7.3 – Construction Change Directives

7.3.6

7.3.6.3

Add the following at the end of Clause 7.3.6.3:



Unless otherwise established in the Contract, (i) the rental value of the Contractor's owned equipment shall be not more than eighty-five percent (85%) of the rates in the current edition of "Compilation of Rental Rates for Construction Equipment," prepared by Associated Equipment Distributors, Oak Brook, Illinois, and (ii) the aggregate amounts charged to the owner for such equipment shall not exceed one hundred percent (100%) of the fair market value.

Add the following at the end of Subparagraph 7.3.6:

The Contractor shall, within twenty-one (21) calendar days after receipt of an order to proceed with work pending issuance of a Change Order, advise the Architect and the Owner if the Contractor believes that the work so requested may require an adjustment in the Contract Sum or an extension of the Contract Time, which advise shall include, without limitation, an accurate written estimate of any increase or decrease in costs and of any delay in the time of completion which will result from the proposed change. The estimate shall indicate the quantity and unit price 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 and sources of delay.

Add the following new Paragraph and Subparagraphs at the end of Article 7:

Paragraph 7.5 – Additional Work

7.5.1 By submitting a bid, the bidder agrees that he has examined the site, and specifications and the drawings are adequate, and the required result can be produced under the drawings and specifications. No claim for extra work will be allowed because of alleged impossibilities in the production of the results specified. Wherever a result is required, the successful bidder shall furnish any and all labor and material to produce the required results to the satisfaction of the Owner.

7.5.2 Where additional work is required by the Owner, and in the opinion of the Architect, this work alters the scope of the contract work, the Owner may elect to pay for all this work in the following manner:

7.5.3 In the case of general contracted work to the cost of hand labor, materials, rental or equipment (other than hand tools) shall be added a total percentage of not to exceed fifteen percent (15%). This percentage is intended to cover supervision, use of hand tools, overhead taxes, insurance and profit. In the case of subcontracted work, the Subcontractor actually doing the work shall be entitled to the fifteen percent (15%) and the General Contractor to an additional ten percent (10%) for handling. The cost of labor shall include hourly wages paid the employee and required hourly fringe benefits, social security and unemployment taxes and workmen's compensation premiums. Material cost shall include delivery cost and taxes.

7.5.4 If the net value of a change results in a credit from the Contractor or Subcontractor, the credit given shall be the cost. The cost used herein shall include all items of labor, materials and equipment.

7.5.5 Any adjustments in contract price must be submitted for approval of the Owner within 21 calendar days of the request for additional work.

7.5.6 The punch list shall in no way relieve the Contractor of his responsibility to do all work specified or shown on the plans.

7.5.7 Overtime, when specifically authorized by the Owner and not as an Extraordinary Measure, shall be paid for by the Owner on the basis of premium payment only, plus the cost of insurance and taxes based on the premium payment period. Overhead and profit will not be paid by the Owner for overtime.



ARTICLE 8 – TIME

Paragraph 8.2 – Progress And Completion

8.2.3

Replace the phrase "Substantial Completion" in Subparagraph 8.2.3 and insert in place thereof the phrase "Final Completion".

Paragraph 8.3 – Delays And Extensions Of Time

8.3.1

Replace all language in Subparagraph 8.3.1 after the word "Order" in the sixth line with the following:

to the extent such delay will prevent the Contractor from achieving Substantial Completion within the Contract Time and if the performance of the Work is not, was not, or would not have been delayed by any other cause for which the Contractor is not entitled to an extension in the Contract Time under the Contract Documents. The Contractor further acknowledges and agrees that adjustments in the Contract Time will be permitted for a delay only to the extent such delay (i) is not caused, or could not have been anticipated, by the Contractor, (ii) could not be limited or avoided by the Contractor's timely notice to the Owner of the delay or reasonable likelihood that a delay will occur, and (iii) is of a duration not less than one (1) day.

8.3.3

Replace Subparagraph 8.3.3 in its entirety with the following:

8.3.3 Notwithstanding anything to the contrary in the Contract Documents, an extension in the Contract Time, to the extent permitted under Subparagraph 8.3.1, shall be the sole remedy of the Contractor for any (i) delay in the commencement, prosecution, or completion of the Work, (ii) hindrance or obstruction in the performance of the Work, (iii) loss of productivity, or (iv) other similar claims (collectively referred to in this

Subparagraph 8.3.3 as "Delays") whether or not such Delays are foreseeable, unless a Delay is caused by acts of the Owner constituting active interference with the Contractor's performance of the Work, and only to the extent such acts continue after the Contractor furnishes the Owner with notice of such interference. In no event shall the Contractor be entitled to any compensation or recovery of any damages, in connection with any Delay, including, without limitation, consequential damages, lost opportunity costs, impact damages, or other similar remuneration. The Owner's exercise of any of its rights or remedies under the Contract Documents (including, without limitation, ordering changes in the Work, or directing suspension, rescheduling, or correction of the Work), regardless of the extent or frequency of the Owner's exercise of such rights or remedies, shall not be construed as active interference with the Contractor's performance of the Work.

Add the following Subparagraph:

8.3.4 If the Contractor submits a progress report indicating, or otherwise expresses an intention to achieve, completion of the Work prior to any completion date required by the Contract Documents or expiration of the Contract Time, no liability of the Owner to the Contractor for any failure of the Contractor to so complete the Work shall be created or implied.

Paragraph 8.4 – Schedule

Add the following Subparagraphs at the end of new Paragraph 8.4 -Schedule at the end of Article 8:



8.4.1 "The Contractor is expected to work overtime, multiple shifts or other means in order to meet the Owner's schedule. Cost to be carried in the Contractor's base bid."

8.4.2 "The Contractor shall make such arrangements with his employees as not to conflict with the wage and hour laws of the State in which the Project is located and the United States of America. Be it further understood that if in the opinion of the Owner and the Architect, the work is not progressing fast enough to insure completion by the date set, the Contractor will be required to work such additional shifts and overtime, as in the opinion of the Owner and Architect, is necessary to complete the work on the required date without extra cost to the Owner."

ARTICLE 9 – PAYMENTS AND COMPLETION

Paragraph 9.2 – Schedule Of Values

9.2.1 Before the first Application for Payment, the Contractor shall submit to the Owner a schedule of values allocated to the various portions of the Work, prepared in such form and supported by such data to substantiate its accuracy as the Owner may require. This schedule, if approved by the Owner, shall be used as a basis for the Contractor's Applications for Payments, and for no other purpose.

Paragraph 9.3 – Applications For Payment

9.3.1

Insert after the third word on the first line of Subparagraph 9.3.1 the word "calendar".

Replace from Line 1 the word "Architect" with the word "Owner".

Delete from the third line of Subparagraph 9.3.1 the words "if required".

Delete Sub-Subparagraph 9.3.1.1 in its entirety.

Add the following clause at the end of Subparagraph 9.3.1:

9.3.1.3 Each Application for Payment shall be accompanied by the following, all in form and substance satisfactory to the Owner: (i) a current Contractor's lien waiver and duly executed and acknowledged sworn statement showing all Subcontractors and material suppliers with whom the Contractor has entered into subcontracts, the amount of each such subcontract, the amount requested for any Subcontractor and material supplier in the requested progress payment, and the amount to be paid to the Contractor from such progress payment, together with similar sworn statements from all such Subcontractors and material suppliers; (ii) duly executed waivers of mechanics' and material suppliers' liens from all Subcontractors and, when appropriate, from material suppliers and lower tier Subcontractors establishing payment or satisfaction of payment of all amounts requested by the Contractor on behalf of such entities or persons in any previous Application for Payment; and (iii) all information and materials required to comply with the requirements of the Contract Documents or reasonably requested by the Owner or the Architect. If required by the owner's title insurer, if any, the Contractor shall execute a personal gap undertaking in form and substance satisfactory to such title insurer.

9.3.2

Add the following at the end of Subparagraph 9.3.2:



The Contractor shall also comply with the following specific requirements:

.1 The aggregate cost of materials stored off site shall not exceed Twenty-Five Thousand Dollars (\$25,000) at any time without written approval of the Owner.

.2 Title to such materials shall be vested in the Owner, as evidenced by documentation satisfactory in form and substance to the Owner and the Owner's Construction Lender, including, without limitation, recorded financing statements, UCC filings, and UCC searches.

.3 With each Application for Payment, the Contractor shall submit to the Owner a written list identifying each location where materials are stored off the Project site and the value of materials at each location. The Contractor shall procure insurance satisfactory to the Owner for materials stored off the Project site in an amount not less than the total value thereof.

.4 The consent of any surety shall be obtained to the extent required prior to payment for any materials stored off the Project site.

.5 Representatives of the Owner and the Lender shall have the right to make inspections of the storage areas at any time.

.6 Such materials shall be (i) protected from diversion, destruction, theft, and damage to the satisfaction of the Owner and the Lender, (ii) specifically marked for use on the Project, and (iii) segregated from other materials at the storage facility.

9.3.3

Add the following clauses at the end of Subparagraph 9.3.3:

.1 The Contractor further expressly undertakes to defend the Indemnitees, at the Contractor's sole expense, against any actions, lawsuits, or proceedings brought against the Indemnitees as a result of liens filed against the Work, the site of any of the Work, the Project site and any improvements thereon, payments due the Contractor, or any portion of the property of any of the Indemnitees (referred to collectively as "liens" in this Subparagraph 9.3.3). The Contractor hereby agrees to indemnify and hold the Indemnitees harmless against any such liens or claims of lien and agrees to pay any judgment or lien resulting from any such actions, lawsuits, or proceedings.

.2 The owner shall release any payments withheld due to a lien or claim of lien if the Contractor obtains security acceptable to the Owner or a lien bond that is (i) issued by a surety acceptable to the Owner, (ii) in form and substance satisfactory to the Owner, and (iii) in an amount not less than One Hundred Fifty Percent (150%) of such lien claim. By posting a lien bond or other acceptable security, however, the Contractor shall not be relieved of any responsibilities or obligations under this Subparagraph 9.3.3, including, without limitation, the duty to defend and indemnify the Indemnitees. The cost of any premiums incurred in connection with such bonds and security shall be the responsibility of the Contractor and shall not be part of, or cause any adjustment to, the Contract Sum.

.3 The Contractor agrees to waive any right it may have to assert a mechanic's or other lien against the Project site and any improvements thereon, including, without limitation, the Work itself. Furthermore, the Contractor will cause a similar provision, waiving any right to a mechanic's or other lien against the property, to be included in all of its subcontracts, any sub-subcontracts, and all contracts with material suppliers. Upon execution of the Agreement, Contractor shall also execute the waiver of lien attached to the Agreement.



.4 Notwithstanding the foregoing, Owner reserves the right to settle any disputed mechanic's or material supplier's lien claim by payments to the lien claimant or by such other means as the Owner, in the Owner's sole discretion, determines is the most economical or advantageous method of settling the dispute. The Contractor shall promptly reimburse the Owner, upon demand, for any payments so made.

Add the following new Subparagraph at the end of Paragraph 9.3:

9.3.4 Thirty (30) calendar days after the Contractor's requisition has been received, there shall be paid to the Contractor such sum, as together with previous amounts paid to him shall equal Ninety Percent (90%) of the value of labor and materials which, according to the Certificate of the Architect have been incorporated into the work and delivered to the site up to and including the last day of the previous month. The Contractor shall include with this invoice a detailed breakdown in accordance with the Owner's cost coding format on AIA G-702 and G-703 Forms, lists of all work accomplished, which substantiate the sums shown on the invoice. Subcontracted items must be in accordance with Owner's cost coding format before requisition can be approved for payment. Discharge of lien by Subcontractor shall be provided from each Subcontractor and material supplier with an aggregate amount exceeding Five Thousand Dollars (\$5,000) with each invoice for work paid for on the previous month. The Contractor shall provide discharge of lien by the Contractor for payment applied for, before payment will be made.

Paragraph 9.4 – Certificates For Payment

9.4.1

Replace Subparagraph 9.4.1 in its entirety with the following:

9.4.1 The Owner will, within seven (7) days after receipt of the Contractor's Application for Payment, either approve the Application for Payment for such amount as the owner determines is properly due, or notify the Contractor in writing of the reasons for withholding certification in whole or in part as provided in Subparagraph 9.5.1.

9.4.2

Delete Subparagraph 9.4.2 in its entirety.

Paragraph 9.5 – Decisions To Withhold Certification

9.5.1

Replace Subparagraph 9.5.1 in its entirety with the following:

9.5.1 The Owner may withhold a Certificate for Payment in Whole or in part, to the extent reasonably necessary to protect the Owner. If the Owner is unable to certify payment in the amount of the Application, the Owner will notify the Contractor as provided in Subparagraph 9.4.1. If the Contractor and Owner cannot agree on a revised amount, the Owner will promptly issue a Certificate for Payment for the amount for which the Owner is able to substantiate such representation. The Owner may also withhold a Certificate for Payment or, because of subsequently discovered evidence, may nullify the whole or a part of a Certificate for Payment previously issued, to such extent as may be necessary in the Owner's opinion protect the Owner from loss for which the Contractor is responsible, including loss resulting from acts and omissions described in Subparagraph 3.3.2, because of:

- .1 defective Work not remedied;
- .2 third party claims filed or reasonable evidence indicating probable filing of such claims unless security acceptable to the Owner is provided by the Contractor;



- .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.

Paragraph 9.6 – Progress Payments

9.6.2

Add the following at the end of Subparagraph 9.6.2:

Notwithstanding anything in this Subparagraph 9.6.2 to the contrary, the Owner may elect, in the Owner's sole discretion, to make any payment requested by the Contractor on behalf of a subcontractor of any tier jointly payable to the Contractor and such subcontractor. The Contractor and such subcontractor shall be responsible for the allocation and disbursement of funds included as part of any such joint payment. In no event shall any joint payment be construed to create any (i) contract between the Owner and a subcontractor of any tier, (ii) obligations from the Owner to such subcontractor, or (iii) rights in such subcontractor against the Owner.

Paragraph 9.7 – Failure Of Payment

9.7.1

Delete the first sentence of Paragraph 9.7.1 and insert in place thereof the following:

If the Owner does not within seven (7) calendar days after receipt of the Contractor's Application for Payment, through no fault of the Contractor, (a) approve the Application for Payment or in a reduced amount, or (b) withhold a Certificate of Payment under Subparagraph 9.5.1 and notify the Contractor pursuant to the terms of Subparagraph 9.4.1, and should such failure continue for seven (7) calendar days after notice from the Contractor to the Owner, or should the Owner fail to pay the Contractor within seven (7) calendar days after the date any payment is due the Contractor pursuant to the terms of the Contract Documents, then the Contractor may stop the Work until payment of the amount owing has been paid.

9.7.2

Add the following new Subparagraph:

9.7.2 If the Owner is entitled to reimbursement or payment from the Contractor under or pursuant to the Contract Documents, such payment shall be made promptly upon demand by the Owner. Notwithstanding anything contained in the Contract Documents to the contrary, if the Contractor fails to promptly make any payment due the Owner, or if the Owner incurs any costs and expenses to cure any default of the Contractor or to correct defective Work, the Owner shall have an absolute right to offset such amount against the Contract Sum and may, in the Owner's sole discretion, elect either to (i) deduct an amount equal to that which the Owner is entitled from any payment then or thereafter due the Contractor from the Owner, or (ii) issue a written notice to the Contractor reducing the Contract Sum by an amount equal to that which the Owner is entitled.



Paragraph 9.8 – Substantial Completion

9.8.1

Delete Subparagraph 9.8.1 in its entirety and substitute the following:

9.8.1 The Date of Substantial Completion of the Work or designated portion thereof is the date certified by the Architect when construction is sufficiently complete, in accordance with the Contract Documents, so the Owner can occupy or utilize the Work or portion thereof designated by the Owner for the use for which it is intended, and without substantial inconvenience or interference; provided, however, that as a condition precedent to Substantial Completion, the Owner has received all certificates of occupancy and any other permits, approvals, licenses, and other documents from any governmental authority having jurisdiction thereof necessary for the beneficial occupancy of the Project.

9.8.2:

Insert at the end of the first sentence, the words "and a list of warranties required by the Contract Documents".

Insert as the next to last sentence "As a condition precedent to Final Payment of the Work, the Contractor will comply with the provisions of Subparagraph 13.5.4, and shall assign to the Owner all warranties required by the Contract Documents and applicable to Work then complete."

Add the following new Sub-Subparagraph at the end of Subparagraph 9.8.2:

9.8.2.1 Prior to final occupancy by the Owner, representatives of the Contractor, Owner, and the Architect will inspect the premises. Any items still incomplete or not consistent with the plans and specifications will be incorporated in a rework list "Punch List". The list given to the Contractor who will complete items on punch list within 14 calendar days of receipt of the list. If the Contractor fails to complete all items of the punch list within 14 calendar days, the Owner will reserve the right, without further notice to the Contractor, to have the remaining work completed by any means, and the cost of such work will be deducted from the final payment due to the Contractor.

Paragraph 9.9 – Partial Occupancy Or Use

Insert the following as Subparagraph 9.9.4:

9.9.4 The Owner shall have the right to occupy or to permit its tenants to occupy portions of the Project prior to full completion subject to the following provisions:

- (a) The Contractor shall receive written notice two (2) weeks prior to such occupancy.
- (b) Such occupancy shall not waive any claims the Owner may have against the Contractor for damages for default under the Contract, except to the extent that such occupancy mitigates the losses suffered by the Owner.
- (c) The Owner shall take reasonable precautions so as not to interfere unduly with the continued progress of the Work.
- (d) If such right is exercised, the Owner will assume responsibility for damages to the occupied area, but assumption of such responsibility by the Owner in no way relieves the Contractor of his obligations as defined under Article 12 of the General Conditions of the Contract.



(e) The Contractor shall exercise caution and be responsible for damage to any of the Owner's property or its tenants' property moved into or near the Project unless such property is negligently exposed to damage by the Owner or by such tenants.

Paragraph 9.10 – Final Completion And Final Payment

9.10.1

Delete from the first sentence "and upon receipt of a final Application for Payment".

In Line 3, replace "Certificate for Payment" with "Certificate of Completion".

Delete the last sentence of Subparagraph 9.10.1 and insert as the last sentence: "If the Architect finds the Work unacceptable, he will prepare a final list of items to be completed or corrected, and when said items are completed or corrected to the satisfaction of the Architect and the Owner, he shall promptly issue a final Certificate for Payment as provided above."

ARTICLE 10 - PROTECTION OF PERSONS AND PROPERTY

Paragraph 10.1 – Safety Precautions And Programs

Add the following new Subparagraphs at the end of Paragraph 10.1:

10.1.2 The Contractor shall conduct and document weekly safety self inspections for the duration of the Work. Copies of all documentation shall immediately be provided to the Owner.

10.1.3 The Contractor shall arrange for monthly jobsite safety audits by his insurance carrier. Copies of all audits shall immediately be provided to the Owner.

Paragraph 10.2 – Safety Of Persons And Property

10.2.3

Add the following at the end of Subparagraph 10.2.3:

The Contractor shall also be responsible, at the Contractor's sole cost and expense, for all measures necessary to protect any property adjacent to the Project and improvements therein. Any damage to such property or improvements shall be promptly repaired by the Contractor.

10.2.4

Add the following at the end of Subparagraph 10.2.4:

When use or storage of explosives or other hazardous materials or equipment or unusual construction methods are necessary, the Contractor shall give the Owner and the Architect reasonable advance notice.

Add the following new Subparagraphs at the end of Paragraph 10.2:

10.2.8 The Contractor shall, or shall require its Subcontractors to: be responsible for the adequate strength and safety of all scaffolding, staging and hoisting equipment and for temporary shoring, bracing and tying; furnish approved hard hats, other personal protective equipment as required, approved first aid supplies, names of two first aid attendants per shift and a posted list of emergency facilities; take prompt action to correct any hazardous conditions reported; comply with the requirements of the Occupational



Safety and Health Act and the Construction Safety Act of 1969, as amended, including all standards and regulations which have been promulgated by the governmental authorities which administer such Acts and said requirements, standards and regulations are incorporated herein by reference. The Contractor shall be directly responsible for compliance therewith on the part of its agents, employees, Application subcontractors, and material men and shall directly receive and be responsible for all citations, assessments, fines or penalties which may be incurred by reason of its agents, for employees, material men or subcontractors, to so comply; provide adequate fire protection procedures during the use of cutting torches, welding equipment, plumbers torches and other flame and spark producing apparatus and comply with NFPA Standard No. 51B, as amended, or its replacement.

10.2.9 The Contractor shall furnish, install, maintain, remove and pay for all temporary staging and planking, ladders, hoisting including operator, material handling, rigging and safety devices as required for his work in conformance with all governing codes and requirements, use of any such devices belonging to the Owner shall not be allowed under any circumstances.

10.2.10 The Contractor, in all cases, shall comply with OSHA, EPA and all other State and Federal agencies when they govern.

10.2.11 The Contractor will be solely responsible for compliance with any "Right to Know" law relating to notice to its employees and others concerning hazardous substances to which they could be exposed in the course or the conduct of the Work, including the labeling of such materials, the filing of any necessary reports relating thereto, and related requirements.

10.2.12 The Occupational Safety and Health Administration (OSHA) Hazard Communication Standard (29 CFR 1910.1200) and other state and local laws and regulations require employers to have Material Safety Data Sheets (MSDS) for all hazardous substances they use in their workplaces. Employers also must make these MSDS's available to employees who are potentially exposed to those hazardous substances. The Contractor is therefore required to provide OSHA-approved labels and MSDS's for the chemical products used during construction. Also any additional information, including supplementary MSDS's, that concern the safety and health aspects of these products. The MSDS and other information should be available at the jobsite with two full copies of all information to be turned over to the Owner's representative as it is received.

10.2.13 When all or a portion of the Work is suspended for any reason, the Contractor shall securely fasten down all coverings and protect the Work, as necessary, from injury by any cause.

10.2.14 The Contractor shall promptly report in writing to the Owner and Architect all accidents arising out of or in connection with the Work that cause death, personal injury, or property damage, giving full details and statements of any witnesses. In addition, if death, serious personal injuries, or serious damages are caused, the accident shall be reported immediately by telephone or messenger to the Owner and the Architect.

Paragraph 10.3 – Hazardous Materials

10.3.1

Replace the words "material or substance" in the second line of Subparagraph 10.3.1 with the following:

concealed and undisclosed hazardous material or substance (as defined in *[insert appropriate cross-reference]*)

10.3.2

Add the following at the end of Subparagraph 10.3.2:



The term "rendered harmless" shall be interpreted to mean that levels of asbestos and polychlorinated biphenyls are less than any applicable exposure standards set forth in OSHA regulations. In no event, however, shall the Owner have any responsibility for any substance or material that is brought to the Project site by the Contractor, any Subcontractor, any material supplier, or any entity for whom any of them is responsible. The Contractor agrees not to use any fill or other materials to be incorporated into the Work that are hazardous, toxic, or made up of any items that are hazardous or toxic.

10.3.3

Delete Subparagraph 10.3.3 in its entirety.

ARTICLE 11 – INSURANCE AND BONDS

Paragraph 11.1 – Contractor's Liability Insurance

11.1.1

Add the following language to the end of Clause .7 in Subparagraph 11.1.1:

, which coverage shall be maintained for no less than two (2) years following final payment.

11.1.2 and 11.1.3

Replace Subparagraphs 11.1.2 and 11.1.3 with the following:

11.1.2 The Contractor shall, for the protection and benefit of the Indemnitees and the Contractor and as part of the Contractor's efforts to satisfy the obligations set forth in Subparagraph 11.1.1, procure, pay for, and maintain in full force and effect, at all times during the performance of the Work until final acceptance of the Work or for such duration as required, policies of insurance issued by a responsible carrier or carriers acceptable to the Owner, and in form and substance reasonably satisfactory to the Owner, which afford the coverages set forth in the Schedule of Insurance, attached to the Agreement. All such insurance shall be written on an occurrence basis. Information concerning reduction of coverage shall be furnished by the Contractor promptly.

11.1.3 The Contractor hereby agrees to deliver to the Owner, within ten (10) days of the date of the Owner- Contractor Agreement and prior to bringing any equipment or personnel onto the site of the Work or the Project site, certified copies of all insurance policies procured by the Contractor under or pursuant to this Paragraph 11.1 or, with consent of the Owner, Certificates of Insurance in form and substance satisfactory to the Owner evidencing the required coverages with limits not less than those specified in the Agreement. The coverage afforded under any insurance policy obtained under or pursuant to this Paragraph 11.1 shall be primary to any valid and collectible insurance carried separately by any of the Indemnitees. Furthermore, all policies and Certificates of Insurance shall expressly provide that no less than thirty (30) days' prior written notice shall be given the Owner in the event of material alteration, cancellation, nonrenewal, or expiration of the coverage contained in such policy or evidenced by such certified copy or Certificate of Insurance.

11.1.4 In no event shall any failure of the Owner to receive certified copies or certificates of policies required under Paragraph 11.1 or to demand receipt of such certified copies or certificates prior to the Contractor's commencing the Work be construed as a waiver by the Owner or the Architect of the Contractor's obligations to obtain insurance pursuant to this Article 11. The obligation to procure and maintain any insurance required by this Article 11 is a separate responsibility of the Contractor and independent of the duty to furnish a certified copy or certificate of such insurance policies.



11.1.5 If the Contractor fails to purchase and maintain, or require to be purchased and maintained, any insurance required under this Paragraph 11.1, the Owner may, but shall not be obligated to, upon five (5) days' written notice to the Contractor, purchase such insurance on behalf of the Contractor and shall be entitled to be reimbursed by the Contractor upon demand.

11.1.6 When any required insurance, due to the attainment of a normal expiration date or renewal date, shall expire, the Contractor shall supply the Owner with Certificates of Insurance and amendatory riders or endorsements that clearly evidence the continuation of all coverage in the same manner, limits of protection, and scope of coverage as was provided by the previous policy. In the event any renewal or replacement policy, for whatever reason obtained or required, is written by a carrier other than that with whom the coverage was previously placed, or the subsequent policy differs in any way from the previous policy, the Contractor shall also furnish the Owner with a certified copy of the renewal or replacement policy unless the Owner provides the Contractor with prior written consent to submit only a Certificate of Insurance for any such policy. All renewal and replacement policies shall be in form and substance satisfactory to the Owner and written by carriers acceptable to the Owner.

11.1.7 Any aggregate limit under the Contractor's liability insurance shall, by endorsement, apply to this project separately.

11.1.8 The Contractor shall maintain for this project the following minimum coverages: (SEE OWNER'S INSTRUCTIONS, AIA G612-B - VERIFY ALL COVERAGE REQUIREMENTS WITH SHAW'S)

Paragraph 11.3 – Project Management Protective Liability Insurance

Delete Paragraph 11.3 in its entirety.

Paragraph 11.4 – Property Insurance

11.4.1.1

Insert at the end of the first sentence of Subparagraph 11.4.1.1 the words:

"if reasonably available at no additional premium, and with an agreed amount endorsement. No Contractor, Subcontractor or Sub-Subcontractor shall be named as loss payee under any policy of insurance purchased by the Owner under this Subparagraph, and no draft or other instrument in payment of any loss shall name the Contractor, any Subcontractor or any Sub-Subcontractor as joint payees."

Add the following at the end of Clause 11.4.1.1:

Property insurance provided by the owner shall not cover any tools, apparatus, machinery, scaffolding, hoists, forms, staging, shoring, and other similar items commonly referred to as construction equipment that may be on the site and the capital value of which is not included in the Work. The Contractor shall make its own arrangements for any insurance it may require on such construction equipment. Any such policy obtained by the Contractor under this Subparagraph 11.4.1 shall include a waiver of subrogation in accordance with the requirements of Subparagraph 11.4.7.



11.4.1.3

Add the following at the end of Clause 11.4.1.3:

Notwithstanding, if the cause of any loss payment under such insurance is the fault of the Contractor, then the Contractor shall pay such deductible.

11.4.3

Add the following at the end of the last sentence of Subparagraph 11.4.3:

to the extent (i) of actual recovery of any insurance proceeds under policies obtained pursuant this Subparagraph 11.4.3 and (ii) permitted by the applicable policies of insurance.

11.4.6

Replace the words "copy of each policy that includes" beginning in the first line of Subparagraph 11.4.6 with the words "certificate of insurance evidencing such."

11.4.7

Begin Subparagraph 11.4.7 with the following words:

If permitted by the Owner's and Contractor's insurance companies, without penalties,

Replace the words "covered by" in the fifth line of Subparagraph 11.4.7 with the following words:

of actual recovery of any insurance proceeds under any

Paragraph 11.5 – Performance Bond And Payment Bond

11.5.1

Delete Subparagraph 11.5.1 and substitute the following:

11.5.1 The Contractor shall furnish a Performance Bond and Labor and Material Payment Bond meeting all statutory requirements of the State of [*Project Location*], in form and substance satisfactory to the Owner and, without limitation, complying with the following specific requirements:

.1 Except as otherwise required by statute, the form and substance of such bonds shall be satisfactory to the Owner in the Owner's sole judgment.

.2 Bonds shall be executed by a responsible surety licensed in [*insert State of the Project location*], with a Best's rating of no less than A/XII, and shall remain in effect for a period not less than two (2) years following the date of Substantial Completion or the time required to resolve any items of incomplete Work and the payment of any disputed amounts, whichever time period is longer.

.3 The Performance Bond and the Labor and Material Payment Bond shall each be in an amount equal to the Contract Sum and all subsequent increases.

.4 The Contractor shall require the attorney in fact who executes the required bonds on behalf of the surety to affix thereto a certified and current copy of his power of attorney indicating the monetary limit of such power.

.5 Every bond under this Subparagraph 11.5.1 must display the Surety's Bond Number. A rider including the following provisions shall be attached to each Bond:



The Surety hereby agrees that it consents to and waives notice of any addition, alteration, omission, change, or other modification of the Contract Documents. Any addition, alteration, change, extension of time, or other modification of the Contract Documents, or a forbearance on the part of either the Owner or the Contractor to the other, shall not release the Surety of its obligations hereunder, and notice to the Surety of such matters is hereby waived.

The Surety agrees that it is obligated under the bonds to any successor, grantee, or assignee of the Owner.

11.5.3

Add the following new Subparagraph 11.5.3:

11.5.3 The Contractor shall keep the surety informed of the progress of the Work, and, where necessary, obtain the surety's consent to, or waiver of, (i) notice of changes in the Work; (ii) request for reduction or release of retention; (iii) request for final payment; and (iv) any other item required by the Surety. The Owner shall be notified by the Contractor, in writing, of all communications with the Surety. The Owner may, in the Owner's sole discretion, inform the Surety of the progress of the Work and obtain consents as necessary to protect the Owner's rights, interest, privileges, and benefits under and pursuant to any bond issued in connection with the Work.

Paragraph 11.6 – General Requirements

Add the following new Paragraph 11.6:

11.6 General Requirements

11.6.1 All insurance coverage procured by the Contractor shall be provided by insurance companies having policy holder ratings no lower than "A" and financial ratings not lower than "XII" in the *Best's Insurance Guide*, latest edition in effect as of the date of the Contract, and subsequently in effect at the time of renewal of any policies required by the Contract Documents.

11.6.2 If the Owner or the Contractor is damaged by the failure of the other party to purchase or maintain insurance required under Article 11, then the party who failed to purchase or maintain the insurance shall bear all reasonable costs (including attorneys' fees and court and settlement expenses) properly attributable thereto.

ARTICLE 12 – UNCOVERING AND CORRECTION OF WORK

Paragraph 12.1 – Uncovering Of Work

Add the following to the end of the first sentence of Subparagraph 12.1.2: "with the consent of Owner".

Paragraph 12.2 – Correction Of Work

Subparagraph 12.2.1

12.2.1.1

Add to the first line of Subparagraph 12.2.1.1 after the word "promptly" the words "but in all events within twenty-one (21) calendar days".

In the first line after the word Architect, change the word "or" to "for".



Add the following to the end of Subparagraph 12.2.1.1:

"and any cost, loss or damage suffered by the Owner as a result of such defect or failure. This obligation shall survive termination of the Contract under Article 14.2.1."

Subparagraph 12.2.2

12.2.2.1

Delete all language beginning with the words "and to" in the 8th line of Clause 12.2.2.1, and continuing through the word "warranty".

12.2.2.3

Replace Clause 12.2.2.3 with the following:

Upon completion of any Work under or pursuant to this Paragraph 12.2, the one (1)-year correction period in connection with the Work requiring correction shall be renewed and recommence. The obligations under Paragraph 12.2 shall cover any repairs and replacement to any part of the Work or other property that is damaged by the defective Work.

Subparagraph 12.2.6

Add the following as Subparagraph 12.2.6:

The Owner shall have the right, after notice to the Contractor of the defect, to operate equipment until defects are corrected and warranties met and shall have the right to operate rejected equipment until it is replaced without charge for depreciation, use, or wear.

Subparagraph 12.2.7

Add the following as Subparagraph 12.2.7:

Roadways, pavements and curbs that are broken, damaged, settled or otherwise defective as a result of receiving, handling, storage of materials or the performance of any work under this Contract, shall be fully restored to the satisfaction of the Owner.

Paragraph 12.3 – Acceptance Of Nonconforming Work

Subparagraph 12.3.1

Insert at the end of Subparagraph 12.3.1:

The Owner shall not be deemed to have elected to accept defective work under this Subparagraph 12.3.1 unless such election is made in writing and appropriate cost adjustments are made.

ARTICLE 13 – MISCELLANEOUS PROVISIONS\

Paragraph 13.2 – Successors And Assigns

13.2.1

Insert the following after the phrase "Subparagraph 13.2.2" in the third line of Subparagraph 13.2.1:

or set forth elsewhere in the Contract Documents,



13.2.2

Replace the first sentence of Subparagraph 13.2.2 with the following:

The Owner may, without consent of the Contractor, assign the Contract to a lender or other entity providing construction financing or credit enhancement for the Project.

Add the following to Subparagraph 13.2.2:

The Contractor hereby consents to the Owner's assignment of this Contract to any recognized lending institution as collateral for financing for the Project, provided: (a) such assignment does not release the Coverage obligations of the Owner to the Contractor hereunder; and (b) such assignment obligates the assignee to perform all the for obligations of the Owner under this Contract arising after an exercise of the assignment. The Owner hereby agrees that in the event of such assignment, the Contractor may rely upon written notice to the Contractor by the assignee setting forth that the assignment is effective and that thereafter until further notice from the assignee, the assignee shall exercise all rights under this Contract. In the event of such an assignment, the Contractor will, on the request of the Owner, execute an agreement with the lender, in form reasonably acceptable to the lender, providing for such until assurances as the lender may reasonably require, including without limitation, the Contractor's agreement (a) to deliver to the lender a copy of any notice given under the Contract, and (b) to recognize the lender as the Owner hereunder upon the exercise of a collateral assignment of this Contract to be given by the Owner to the lender, and thereafter to perform all of its obligations hereunder upon the lender's performance of all of the obligations of the Owner arising after the date of the assignment and of such obligations of the Owner arising before the date of the assignment as are reasonably susceptible of performance by the lender.

13.2.3

Add the following Subparagraph:

13.2.3 After Substantial Completion, the Owner's rights under this Contract may be assigned to any owner of the Project from time to time, without restriction.

Paragraph 13.3 – Written Notice

13.3.1

Add the following at the end of Subparagraph 13.3.1:

Written notice shall be delivered by hand or shall be mailed by registered or certified mail addressed to the party for whom it was intended at its address appearing on the Owner-Contractor Agreement or to any other address which any such party may designate by like notice to the others, and, in the case of the Owner, two (2) notices are required, the first addressed to Owner's Representative, and the second addressed to the Owner's Legal Department. Any such notice shall be deemed duly given when so hand delivered or when deposited with the U.S. Postal Service.

Paragraph 13.4 – Rights And Remedies

13.4.1

Add the following at the beginning of Subparagraph 13.4.1:

Except as expressly provided in the Contract Documents,



Paragraph 13.5 – Tests And Inspections

13.5.2

Insert prior to the first sentence of Subparagraph 13.5.2:

All material and workmanship shall be subject to inspection, examination, and testing by the Architect during the further manufacture and construction, in a manner which does not unnecessarily delay progress of the Work. The Contractor shall keep the Architect informed of the progress of the Work so that the Architect can reasonably schedule his inspection of the Work. The Contractor shall furnish promptly all reasonable facilities, labor and material necessary for the safe and convenient inspection and testing of the Work as may be requested by Architect.

13.5.3

Add the following at the end of Subparagraph 13.5.3:

The Contractor also agrees that the cost of testing services required for the convenience of the Contractor in his scheduling and performance of the Work, and the cost of testing services related to remedial operations performed to correct deficiencies in the Work, shall be borne by the Contractor.

Add the following Subparagraphs:

13.5.7 Certificates of inspection, testing or approval, including a certificate(s) of occupancy under the Building Code, operating permits for any mechanical apparatus furnished and installed under this Agreement and all other such certificates which may be required to permit full use and occupancy of the Work by the Owner or by its tenants shall be secured by the Contractor and delivered by him to the Owner and Architect within seven (7) calendar days of receipt by the Contractor. Compliance with the foregoing shall be a condition precedent to Substantial Completion of the Work.

13.5.8 The following tests shall be undertaken, supervised and/or paid for by the Contractor: (a) Concrete testing by Contractor -slump, air entrainment, compressive strength and as specified in Division 3. (b) Soil testing by Shaw's - soil compaction tests as specified in Division 2. If any test fails, the cost of re-testing for tests the Contractor is responsible for will be at the Contractor's expense.

13.5.9 Should the Designer perform more than one re-inspection due to failure of the work to comply with the claims of status of completion made by the Contractor: (a) Owner will compensate Designer for such additional services. (b) Owner will deduct the amount of such compensation from the final payment to the Contractor.

Paragraph 13.7 – Commencement Of Statutory Limitation Period

Delete Paragraph 13.7 in its entirety.

Paragraph 13.8 – Construction Meetings

Add the following new paragraphs at the end of Article 13 -Miscellaneous Provisions.



Paragraph 13.8 - Construction Meetings

13.8 Weekly construction meetings shall be held at the site by the Contractor. All Subcontractors working on the project within that week and the prior and following weeks shall be in attendance. Meeting minutes shall be maintained by the Owner and forwarded to the Architect and Contractor prior to the next weekly meeting. Upon initiation of the work, a schedule shall be agreed upon for the day, time and place of the weekly construction meetings.

Paragraph 13.9 - Security

13.9.1 The Contractor shall be responsible to take every precaution necessary to prevent theft, vandalism and malicious mischief with his own and his Subcontractor's personnel. Any violation will require immediate dismissal of the employee.

13.9.2 The Owner will provide store personnel for normal store security.

13.9.3 All building openings shall be secured by means acceptable to Owner or Owner's Representative each day before leaving the job site.

13.9.4 The Contractor shall provide all barriers and signs necessary to protect the general public from all construction activities.

13.9.5 The Contractor shall provide badges for all of his and his Subcontractor's employees, which shall be worn at all times, and will be required for access to the building. The badge shall be at least 2-1/2 inches in diameter, with bright background color and contrasting lettering identifying the Contractor, and shall be numerically sequenced with a master log kept by the Superintendent identifying all employees. This badge will be required for admission to the building by the Owner's security personnel as stated above, will designate the door to be used for access by all Contractor personnel.

ARTICLE 14 - TERMINATION OR SUSPENSION OF THE CONTRACT

Paragraph 14.1 – Termination By The Contractor

14.1.1

Delete Clauses .3 and .4 in Subparagraph 14.1.1.

14.1.3

In the second line of Subparagraph 14.1.3, delete the words "and Architect."

In the last line of Subparagraph 14.1.3, delete the words "and damages" and add the following sentence: "If the Contractor terminates the Contract because of a failure by the Owner to make payment as provided in the Contract Documents, the Contractor shall also be entitled to claim and recovery for all damages sustained."



Paragraph 14.2 – Termination By The Owner For Cause

Delete Subparagraphs 14.2.1 and 14.2.2 in their entirety and substitute the following:

14.2.1 If a petition is filed by the Contractor, or against the Contractor with his consent, under any federal or state law concerning bankruptcy, reorganization, insolvency or relief from creditors, or if such a petition is filed against the Contractor without his consent and is not dismissed within sixty (60) days; or if the Contractor is generally not paying his debts as they become due; or if the Contractor becomes insolvent; or if the Contractor consents to the appointment of a receiver, trustee, liquidator, custodian or the like of the Contractor or of all or any substantial portion of its assets; or if a receiver, trustee, liquidator, custodian or the like is appointed with respect to the Contractor or takes possession of all or any substantial portion of its assets and such appointment or possession is not terminated within sixty (60) days; or if the Contractor makes an assignment for the benefit of creditors; or if the Contractor refuses or fails, except in cases for which extension of time is provided, to supply enough properly skilled workmen or proper materials or if he fails to make prompt payment to Subcontractors, or for materials or labor, or disregards laws, ordinances, rules, regulations or orders of any public authority having jurisdiction, or otherwise is guilty of a violation of any provision of the Contract Documents, and if such default or violation shall continue uncured for seven (7) days after notice by the Owner to the Contractor; then in any such case, the Owner may, without prejudice to any right or remedy, and after giving the Contractor and his surety, if any, one (1) additional day before a written notice, terminate the employment of the Contractor and take possession of the site and of all materials, equipment, tools, construction equipment and machinery thereon owned by the Contractor and may finish the Work by whatever method he may deem expedient. In such case, the Contractor shall not be entitled to receive any further payment until the Work is finished.

Paragraph 14.4 – Termination By The Owner For Convenience

14.4.3

Replace Subparagraph 14.4.3 with the following:

14.4.3 Upon such termination, the Contractor shall recover as its sole remedy payment for Work properly performed in connection with the terminated portion of the Work prior to the effective date of termination and for items properly and timely fabricated off the Project site, delivered and stored in accordance with the Owner's instructions. The Contractor hereby waives and forfeits all other claims for payment and damages, including, without limitation, anticipated profits. The Owner shall be credited for (i) payments previously made to the Contractor for the terminated portion of the Work, (ii) claims that the Owner has against the Contractor under the Contract, and (iii) the value of the materials, supplies, equipment, or other items that are to be disposed of by the Contractor that are part of the Contract Sum.



OWNER'S INSTRUCTIONS FOR INSURANCE AND BONDS

AIA DOCUMENT G612, PART B

PROJECT:

DATE:

OWNER:

PROJECT NO:

NOTATION TO OWNER—In consultation with your insurance advisor, complete this form, which will provide your instructions regarding your requirements for bonds and insurance for this Project. Please return the completed form, along with any other instructions relating to bonds and insurance, to the Architect.

TO: (ARCHITECT)

Attention:

You are hereby instructed to include the following information and requirements in appropriate locations in the Bidding Documents and the Contract Documents. These requirements are based on Article 11 of AIA Document A201, General Conditions of the Contract for Construction, 1987 edition (copy attached hereto), and the completion of these instructions is presumed to be based thereon.

A. CONTRACTOR'S LIABILITY INSURANCE

Concerning the insurance described in Paragraph 11.1 of AIA Document A201, 1987 edition, specify the following minimum limits:

1. Workers' Compensation

- | | |
|--|------------------------------------|
| <input type="checkbox"/> State: | Statutory |
| <input type="checkbox"/> Voluntary Compensation (by any exempt entities): | Same as State Workers Compensation |
| <input type="checkbox"/> Applicable Federal (e.g., Longshoremen, harbor work, Work at or outside U.S. Boundaries): | Statutory |
| <input type="checkbox"/> Maritime: | \$ _____ |
| <input type="checkbox"/> Employer's Liability: | \$ _____ Each accident |
| | \$ _____ Disease, Policy limit |
| | \$ _____ Disease, Each employee |
| <input type="checkbox"/> Benefits required by union labor contracts: | As applicable |

2. General Liability (including Premises-Operations; Independent Contractors' Protective; Products and Completed Operations; Broad Form Property Damage):

(a) Bodily Injury:

\$ _____ Each Occurrence
\$ _____ Aggregate

(b) Property Damage:

\$ _____ Each Occurrence
\$ _____ Aggregate

- (c) Products and Completed Operations Insurance shall be maintained for a minimum period of 1 2
 _____ year(s) after final payment and the Contractor shall continue to provide evidence of such coverage to the Owner on an annual basis during the aforementioned period.



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(d) Property Damage Liability Insurance shall include coverage for the following hazards:

- X (Explosion)
- C (Collapse)
- U (Underground)

(e) Contractual Liability (Hold Harmless Coverage):

Bodily Injury:
\$ _____ Each Occurrence
Property Damage:
\$ _____ Each Occurrence
\$ _____ Aggregate

(f) Personal Injury (with Employment Exclusion deleted, if applicable):

\$ _____ Aggregate

(g) If the General Liability policy includes a General Aggregate, such General Aggregate shall be not less than \$ _____. Policy shall be endorsed to have General Aggregate apply to this Project only:

Yes No

3. Umbrella Excess Liability

\$ _____ Over primary insurance
\$ _____ Retention

4. Automobile Liability (owned, non-owned, hired):

Bodily Injury:
\$ _____ Each Person
\$ _____ Each Accident
Property Damage:
\$ _____ Each Occurrence

5. Aircraft Liability (owned and non-owned) when applicable, as follows: (*Select one*)

- With limits proposed by the Contractor for the Owner's approval.
- With the following limits:

Bodily Injury:
\$ _____ Each Person
\$ _____ Each Occurrence
Property Damage:
\$ _____ Each Occurrence

6. Watercraft Liability (owned and non-owned) when applicable, as follows: (*Select one*)

- With limits proposed by the Contractor for the Owner's approval.
- With the following limits:

Bodily Injury:
\$ _____ Each Person
\$ _____ Each Occurrence
Property Damage:
\$ _____ Each Occurrence

7. Other Insurance:

COVERAGE

AMOUNT

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B. OWNER'S LIABILITY INSURANCE

Concerning the insurance described in Paragraph 11.2 of AIA Document A201, 1987 edition: (*Select one*)

- No modification is required.
- The Contractor shall provide this insurance with the following limits:

- (1) Bodily Injury:
 \$ _____ Each Occurrence
 \$ _____ Aggregate
- (2) Property Damage:
 \$ _____ Each Occurrence
 \$ _____ Aggregate

C. PROPERTY INSURANCE

Concerning the insurance described in Paragraph 11.3 of AIA Document A201, 1987 edition: *(Complete (a), (b) or (c), and then complete (d) and (e).)*

- (a) No modification is required; the Owner will purchase (including coverage for all materials and equipment to be incorporated or used in the Project when stored off the site or when in transit).
- (b) The Owner will purchase with the following modifications:

- (c) The Contractor shall purchase the following: *(Select one)*

All-Risk

Other *(specify)* _____

On the following form: *(Select one)*

Completed Value

Reporting

In the names of the Owner, Contractor, Subcontractor and Sub-subcontractors as their interests may appear with limits as follows: *(Select one)*

Amount equal to the Contract Sum for the Work.

Other *(specify)* _____

(NOTE: If coverage for alterations and additions to existing structures is to be included under the Owner's existing coverage, specific instructions should be included under Item D below.)

- (d) Boiler and Machinery Insurance.

Concerning the insurance described in Subparagraph 11.3.2 of AIA Document A201, 1987 edition:

- (1) The Owner shall provide this insurance with a limit of \$ _____.
- (2) Objects to be insured: *(List objects)*

- (e) Loss of Use Insurance.

Concerning the insurance described in Subparagraph 11.3.3 of AIA Document A201, 1987 edition: *(Select one)*

No modification is required.

The Contractor shall provide this insurance with limits of \$ _____.

D. OTHER INSTRUCTIONS RELATED TO BONDS OR INSURANCE

(If none, please so indicate.)

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E. BONDS

(a) Performance Bond and Payment Bond as described in Paragraph 11.4 of AIA Document A201, 1987 edition, will be:

- Required
- Not required

(b) Required bonds shall be in the amount of *(Select one)*

- | | | | |
|-------------|---|---|-----------------------------------|
| Performance | <input type="checkbox"/> 100% of Contract Sum | <input type="checkbox"/> _____% of Contract Sum | <input type="checkbox"/> \$ _____ |
| Payment | <input type="checkbox"/> 100% of Contract Sum | <input type="checkbox"/> _____% of Contract Sum | <input type="checkbox"/> \$ _____ |

(c) Form of bonds shall be *(Select one)*

- AIA Document A311
- AIA Document A312
- Other _____

(Describe and furnish sample copy if available)

(d) Special instructions:

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Owner

By

Date

SECTION 01020

CONTRACT DESCRIPTION

PART 1 - GENERAL

1.01 GENERAL CONDITIONS

- A. See AIA Document A201.

1.02 SPECIFICATIONS

- A. Titles to Divisions and paragraphs in these specifications and in the notes on the drawings are introduced for convenience, and shall not be taken as an exact, correct or complete segregation of materials and labor.
- B. No responsibility is assumed by the Owner for omissions or duplications by the Contractor or his subcontractors due to real or alleged error in arrangement of matter in this specification or in notes on the drawings.
- C. Latest revisions of Federal, State and ASTM Specifications shall be used where only the specification number without date or revision number is given in specifications.
- D. The omissions from the plans and/or specification of express reference to any labor or materials reasonably to be inferred therefrom and necessary for the proper execution of the work shall not relieve the Contractor or Subcontractor from furnishing them of a kind in keeping with the general character of the work.

1.03 DRAWINGS

- A. List of Drawings:

<u>No.</u>	<u>Dwg Title</u>	<u>Date</u>	<u>General</u> <u>Revision</u>
COVER SHEET			11-10-00
G100	ABBREVIATIONS AND LEGENDS		11-10-00
AD101	DEMOLITION PLAN		11-10-00
A101	FLOOR PLAN, DOOR SCHEDULE, DETAILS & PARTITION TYPES		11-10-00
A200	ROOF PLAN AND DETAILS		11-10-00
A301	REFLECTED CEILING PLAN		11-10-00
A401	EXTERIOR ELEVATIONS		11-10-00
A501	BUILDING SECTIONS		11-10-00

A601	EXTERIOR DETAILS	11-10-00
S101	RETAIL FOUNDATION PLAN	11-10-00
S201	RETAIL FRAMING PLAN	11-10-00
S301	FOUNDATION NOTES AND DETAILS	11-10-00
S302	FRAMING NOTES AND DETAILS	11-10-00
S303	STRUCTURAL DETAILS	11-10-00
PD101	FLOOR PLAN DEMOLITION	11-10-00
P101	FLOOR PLAN PLUMBING	11-10-00
M101	FLOOR PLAN - HVAC	11-10-00
M201	DETAILS	11-10-00
M301	SCHEDULES	11-10-00
ED101	FLOOR PLAN - SOUTH ELECTRICAL DEMOLITION	11-10-00
ED102	FLOOR PLAN - NORTH ELECTRICAL DEMOLITION	11-10-00
E001	LEGEND SCHEDULES & DETAILS	11-10-00
E101	FLOOR PLAN LIGHTING	11-10-00
E201	FLOOR PLAN UNDERGROUND CONDUIT	11-10-00
E202	FLOOR PLAN - SOUTH POWER	11-10-00
E203	FLOOR PLAN - NORTH POWER	11-10-00
E301	RISERS SCHEDULES & DETAILS	11-10-00

END OF SECTION

SECTION 01300

ADMINISTRATION

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Work in this section consists of all construction related administration, meetings, and all submittals required for construction.

1.02 JOB SITE ADMINISTRATION

- A. The Contractor shall keep an authorized supervisory representative on site during all working hours who shall act as the agent of the Contractor.
- B. The supervisory representative on the contract work shall be a competent English-speaking superintendent capable of reading and thoroughly understanding the drawings and specifications, with full authority to promptly fulfill the Contractor's duties and responsibilities on the job.
- C. The Contractor's supervisory representative shall be subject to the approval of the Owner. The supervisory representative shall not be removed from the work without prior written consent of the Owner. If in the opinion of the Owner or Architect, the supervisory representative or any of his successors, proves incompetent, not conscientious or not industrious, then the Contractor shall replace him within 10 calendar days with another person approved by the Owner at no additional cost to the Owner. Approval shall not, in any way, relieve or diminish the Contractor's responsibility for supervision of the work.
- D. Opening Day of the Facility Shall Be Staffed by the Contractor and Subcontractor as Follows:
 - 1. A working foreman familiar with the project from each trade listed herein shall be at the site eight (8) hours minimum on the opening day of the Supermarket; electrical, mechanical, plumbing, controls and Shaw's Refrigeration Contractor.
 - 2. The foreman for the trades listed above and the Sprinkler Contractor shall provide a familiarization tour of equipment before the store opens. The Subcontractor shall obtain a signed receipt that the tour was conducted. A formal presentation and operating instructions will be made approximately 3 weeks after store opening. One day shall be provided for HVAC, plumbing, sprinkler and electrical presentation. Furnish proper personnel that can provide a complete explanation of the entire system to the Store Management, Maintenance, Engineering and Construction Representatives.
- E. The Following Will Be Required of All Contractor Personnel:
 - 1. No smoking, eating or drinking inside building after delivery of Owner's equipment.
 - 2. Use of Supermarket Lounge and toilet facilities will not be allowed.
 - 3. Use of audio equipment inside the building is prohibited for the entire duration of the project.

4. Sexual harassment of any nature will not be tolerated.
5. Upon partial occupancy by Shaw's Store operations, the following requirements shall be followed:
 - a. All Construction Personnel will be required to wear I.D. badges on site at all times.
 - b. All building access for Construction Personnel will be through one entrance. Anyone wishing to enter or leave the building must utilize this entrance. A security guard will be stationed at this entrance to log in and out all personnel. This badge entrance procedure will be strictly enforced.
 - c. Jobsite delivery access will be through one entrance. Access to alternate delivery entrances will not be permitted without prior approval of Shaw's.

F. Failure to comply with the requirements outlined in paragraph E above will result in immediate action by Shaw's.

1. First offense -- individual removed from premises.
2. Second offense -- responsible subcontractor removed permanently from premises.
3. Any infractions will adversely impact future consideration of responsible Subcontractor.

1.03 CONSTRUCTION MEETINGS

- A. Weekly construction meetings shall be held at the site by the Developer and Contractor. The Contractor and all Subcontractors working on the project within that week shall be in attendance. Meeting minutes will be maintained by the Developer or Contractor and forwarded to the Developer, the Owner, Shaw's, the Contractor and all other Contractors prior to the next weekly meeting. Before initiation of the work a schedule shall be agreed upon for the day, time and place of the weekly construction meetings.
- B. The Rough Agenda for the Weekly Meeting Will Be as Follows:
 1. Review previous meeting notes.
 2. Construction schedule (current and planned). The Contractor shall provide a weekly written job schedule for all remodel projects.
 3. Submittals.
 4. Problems.
 5. New items.
 6. Changes.
- C. Submit a Progress Schedule, with a minimum of 100 activities showing the starting and completion dates of each activity, at the Pre-Construction Meeting. The Progress Schedule shall be in the form of a Gant Bar Chart or CPM Chart and shall indicate week numbers, weeks and durations of activities. See sample form at the end of this Section.

1.04 COORDINATION

- A. Coordinate work of the various sections of Specifications to assure efficient and orderly sequence of installation of construction elements, with provisions for accommodating items installed later.
- B. Coordinate space requirements and installation of mechanical and electrical work which are indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduits, as closely as practicable; make runs parallel with lines of building. Utilize

spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.

- C. Coordinate with the Owner, the location and installation of coolers, freezers, refrigeration, equipment, and shelving work with construction sequence.
 - 1. Refrigeration lines require priority in location and elevation of underground and above grade runs. Coordinate other utilities with the Refrigeration Contractor.
- D. In finished areas except as otherwise shown, conceal pipes, ducts, and wiring in the construction. Coordinate locations of fixtures and outlets with finish elements.
- E. Coordinate all work with the Owner.

1.05 REFERENCE STANDARDS

- A. For Products specified by association or trade standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
- B. The date of the standard is that in effect as of the Bid date, except when a specific date is specified.
- C. Obtain copies of standards when required by Contract Documents. Maintain copy at job site during progress of the specific work.

1.06 CHANGE ORDERS REQUEST

- A. Should the Owner request a price for contemplated changes in the work, the Contractor shall promptly advise, within 14 calendar days, the Architect, in writing, as to credit or cost proposed for the described change. The Contractor's written reply shall include a cost breakdown with appropriate back-up by Division of the proposed change in Contract Sum and extension of time required, if any.

1.07 SUBMITTALS

A. General Provisions:

- 1. Make all submittals including Samples, Shop Drawings, and Project Data within 45 calendar days of Notice of Award.
- 2. Submit Shop Drawings to Shaw's Insurance Carrier for approval as outlined in each section or otherwise directed by Shaw's Project Representative. In general, submittals are required for Sprinkler System, Fire Suppression Systems, Roof System and Fire Alarm System.
- 3. Provisions in this section are mandatory procedures for preparing and submitting Samples, Shop Drawings, and Product Data.
- 4. Job delays occasioned by requirement of re-submission of samples, Shop Drawings, and Product Data not in accord with Contract Documents are Contractor's responsibility and will not be considered valid justification for extension of time.

B. Submittals Schedule:

- 1. Contractor shall submit proposed submittals schedule to Owner and Architect for review within ten calendar days following Notice of Award.

2. Schedule Purpose is to:
 - a. Demonstrate that submittals, shop drawings, data, samples and mock-ups required for Work are addressed by Contractor.
 - b. Assist Architect in scheduling timely review of submittals.
 3. Schedule Contents: Description of submitted item, proposed date of submittal and proposed date of requested return by Architect.
 4. Contractor shall submit accepted schedule within ten calendar days after joint review date.
- C. Product Data:
1. Contractor shall include product manufacturer's standard printed material, dated, with product description and installation instructions indicated; delete data not related to this Project or mark "VOID" as applicable.
 2. Number of Copies Submitted: Number required by Contractor plus four which will be retained by Architect and Owner.
- D. Shop Drawings:
1. Contractor shall conform to the following requirements:
 - a. Number sheets consecutively.
 - b. Indicate working and erection dimensions and relationships to adjacent work.
 - c. Indicate:
 - (1) Arrangements and sectional views, as applicable.
 - (2) Material, gauges, thickness, finishes, and characteristics.
 - (3) Anchoring and fastening details; include information for making connections to adjacent work.
 - d. Cross-reference drawing details and specification paragraphs applicable to submitted data.
 2. Contractor shall submit one sepia transparency and three black line prints of shop drawings.
 3. Photocopy, autopositive, or other reproduction of Architect's Drawings are not acceptable for Subcontractors' or Vendors' Shop Drawings.
- E. Samples:
1. Contractor shall prepare samples in sizes, shapes, and finishes in accord with provisions of individual specification sections.
 2. Samples furnished under this section are not to be confused with full-size, on-the-site "Mock-Ups" called for in some specification sections.
 3. Number of samples submitted: Number required by Subcontractor, plus two which will be retained by Architect and Owner, unless otherwise indicated. Additional samples shall be furnished as requested.
- F. Quality Control Submittals: Certificates: Contractor shall submit certificates from manufacturers for each product indicating materials supplied or installed are asbestos-free.
- G. Operations and Maintenance Manuals: Submit to Architect for review. All copies will be returned to contractor for final distribution to Owner. See Section 01700 - PROJECT CLOSEOUT for more information.

H. Review:

1. Contractors:

- a. Review submittals and stamp with approval action stamp containing Contractor's name, word "Approved," signed initials of approving agent, date of approval action, review notes, comments, and corrections required prior to submission to Architect. By so noting, Contractor indicates that he has reviewed and approves materials, equipment, quantities, and dimensions represented by particular submittal.
- b. Contractor represents by submitting samples, Shop Drawings, and Product Data that he has complied with provisions specified. Submissions made without Contractor's approval indicated thereon will be returned without being reviewed for compliance with this requirement.
- c. Date each submittal; indicate name of Project, Contractor, Subcontractor, as applicable; description or name of equipment, material, or product; and identify Work use location.
- d. Accompany submittal with transmittal letter containing Project name, Contractor's name, number of samples or drawings, titles, and other pertinent data. Outline deviations, if any, in submittals from requirements of Contract Documents.

2. Architects:

- a. Review submittals within ten calendar days of receipt from Contractor.

I. Resubmission: Contractor shall make corrections and changes indicated for rejected submissions; resubmit in same manner specified above until Architect no longer requires re-submission.

J. Distribution: Contractor is responsible for obtaining and distributing copies of submittals to his Subcontractors and Material Suppliers. Make prints of reviewed Shop Drawings from transparencies imprinted with Architect's appropriate stamp.

1. Contractor shall maintain at the present site an orderly file of all approved submittals bearing Architect's stamp for Project duration.

1.08 REQUEST FOR INFORMATION

- A. Should the Contractor require additional information or clarification regarding the work, a written request using the R.F.I. form attached at the end of this Section shall be submitted to the appropriate party.

PART 2 - PRODUCTS (Not applicable)

PART 3 - EXECUTION

3.01 Request for Information on the following pages.

END OF SECTION

SECTION 01400

QUALITY CONTROL

PART 1 - GENERAL

1.01 CONSTRUCTION LAYOUT

- A. In addition to work described in the Supplementary Conditions, the Contractor shall take the responsibility for verifying and locating existing systems and laying out his work in three dimensions in accordance with the drawings and with great accuracy in establishing and maintaining dimensional control so that it will agree with established lines and levels. All changes from the plans issued for permit shall be noted on the permit set. The permit set shall be turned over to the Architect after completion for preparation of "As Built" plan. Final retainage will not be released without the "As Built" permit submittal to the Architect.
- B. Any discrepancy between drawings and existing conditions shall be brought to the attention of Shaw's and the Architect immediately describing such discrepancies. Work shall not proceed until he has received written instructions. The Contractor and Shaw's shall follow-up such communications in writing.

1.02 TESTS AND INSPECTIONS

- A. The Contractor shall coordinate with the testing agency hired by Shaw's making the tests and inspections of workmanship and materials as may be required by the Building Code, State and municipal laws, and as required under the various sections of the specifications. See Supplementary Conditions and Specifications for quantity and additional requirements.

PART 2 - PRODUCTS (Not applicable)

PART 3 - EXECUTION (Not applicable)

END OF SECTION

SECTION 01535

TEMPORARY FACILITIES

PART 1 - GENERAL

1.01 TEMPORARY SCAFFOLDING AND CONVEYANCES

- A. The Contractor shall furnish, install, maintain, remove and pay for all temporary staging and planking, ladders, hoisting including operator, rigging and safety devices as required for work covered under his contract.

1.02 TEMPORARY TOILETS

- A. The Contractor shall furnish, erect and maintain for the duration of the Contract, chemical toilet facilities in sufficient quantity to accommodate all workmen on the entire project.
- B. Chemical toilets and their maintenance shall meet requirements of state and local health regulations and ordinances.

1.03 TEMPORARY OFFICES AND PARKING

- A. The Contractor shall provide on the site use of a field office for personnel. Provide a separate room (or building) of at least 8x8 feet in size, or equivalent area, for the use of the Shaw's Representative. The Contractor's office and Shaw's representative's office shall have for each, lights, heat, air conditioning, lockable file cabinet, telephone with answering machine, fax machine, chairs, and a suitable desk type work area and drawing table. The Contractor shall have two (2) coin-type telephones installed for use of his Subcontractors and site visitors for the duration of the project.
- B. The Contractor will be permitted to park employees' passenger cars (and subcontractors' employees) on the site where directed by the Owner. The Owner will not be responsible for cars parking on the site. The Contractor shall be responsible for any damage to paving, curbing, landscaping, etc., and shall repair or restore any damage to parking lot incurred during construction of project, to the satisfaction of the Owner.

1.04 TEMPORARY SERVICES

- A. Temporary Water: The Contractor shall provide potable drinking water supply, satisfactorily cooled, for all employees.
- B. Temporary Electricity:
 - 1. A minimum of 50 foot candles shall be supplied at all surfaces for taping, painting and finish work. See Division 16 for Temporary Electricity.
 - 2. Make arrangements for metered temporary power with the local Power Company and pay all costs. Power shall be maintained by the Contractor through to substantial completion of the project.

C. Temporary Telephone:

1. Install a job telephone and answering machine for Shaw's Representative phone.
2. Make arrangements and pay costs for installation and operation of telephone service for Contractor's and Shaw's Representative Offices, including monthly charges and necessary accounting of toll calls. Long distance and toll calls shall be paid for by the party making the call.

1.05 TEMPORARY ENCLOSURES, VENTILATION AND HEAT

- A. Temporary Enclosures: Provide temporary weathertight enclosures for all exterior openings as soon as walls and roof are built, so as to protect all work and Shaw's equipment from the weather.
- B. Temporary Ventilation: Provision shall be made during construction to allow the escape of "Construction Moisture" by use of a breathing type enclosure on at least part of the openings, or by mechanical ventilation.
1. All spaces shall be mechanically ventilated to protect occupants from application and installation of odor causing materials. The area where material is being used shall be isolated from the new or existing ventilation system. No work creating fumes shall be done in an existing building while it is occupied by the Owner. Ventilation shall be maintained for a period of 24 hours or until release of fumes has subsided, whichever is longer.
- C. Temporary Heat: As soon as the building addition is enclosed, furnish and maintain temporary heat at a temperature of not less than 55EF. Maintain temperature of not less than 65°F within all parts of the building 24 hours before setting tile. The system shall be approved by Shaw's. The use of "salamanders" will not be permitted.

1.06 PRECAUTION AGAINST FREEZING

- A. The work must be carried on without interruption despite adverse weather and temperature conditions and the Contractor shall provide such protection and conduct his work in such a manner as will avoid delay or damage to the work.

1.07 SITE DRAINAGE AND PUMPING

- A. The Contractor shall take over the responsibility for site drainage in areas of new earth work, upon entering the premises, and shall maintain such drainage during the life of his Contract in a manner approved by the local Conservation Commission, other regulating agency and Shaw's Representative and so as not to adversely affect adjacent property and utilities in the street.

1.08 BLASTING

- A. Blasting shall be performed only after written approval has been given by the local authorities for such operation. The Contractor shall protect all persons and property from injury and damage. See Section 02200 for additional information.

1.09 RESTORATION OF ROADWAYS AND PAVEMENTS

- A. Roadways, pavements and curbs that are broken, damaged, settled, or otherwise defective as a result of receiving, handling, storage of materials or the performance of any work under this Contract, shall be fully restored to the satisfaction of the authorities having jurisdiction.

1.10 SNOW REMOVAL

- A. Remove snow from access to and within limit of work lines which, in the opinion of Shaw's Representative, impairs progress of work, is detrimental to workmen, or impairs trucking delivery or moving of materials at the site. Remove snow at all parking and roads to bare pavement prior to turnover.

1.11 FIRE PROTECTION

- A. See Cutting and Patching in the Supplementary Conditions for fire protection requirements.

1.12 SECURITY

- A. Full responsibility shall be placed on the General Contractor as a professional builder to construct safely and to protect the building and contents and its occupants, regardless of the information given herein which is only a general description of minimum work to be performed.
- B. All excavations shall be protected and well marked with fences or barriers and as required by appropriate Public Officials and other sections of these specifications.
- C. Loss of business or damage to structures, to store fixtures, or to products therein caused by construction under this Contract shall be repaired, replaced, or paid for by this Contractor at no cost to the Owners.
- D. This Contractor shall restore to its original condition any portion of the permanent structure or equipment which is damaged by the Contractor or his subcontractor's operations.
- E. Until the building is made secure from unauthorized entry, the Contractor shall provide 24-hour security service from the time any Shaw's supplied equipment arrives until the building is made secure to the satisfaction of Shaw's.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION

SECTION 01630

SUBSTITUTIONS AND PRODUCT OPTIONS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Substitution procedures during the bid period shall be followed to provide equality of bids. The Architect and Owner are not obligated to consider substitutions submitted after bids are received. Contractors submitting substitutions after bids are received will not be given additional compensation for rejected submittals.

1.02 SUBSTITUTIONS

- A. Submit two copies of request for substitution. Include in the request:
1. Complete data substantiating compliance of proposed substitution with Contract Documents.
 2. For products:
 - a. Product identification including manufacturer's name and address.
 - b. Manufacturer's Literature:
 - (1) Product description.
 - (2) Performance and test data.
 - (3) Reference standards.
 - c. Samples.
 - d. Name and address of similar projects on which product was used, and date of installation.
 3. Itemized comparison of product substitution with product specified.
 4. Changes in construction schedule.
 5. Accurate cost data on proposed substitution in comparison with product specified.
- B. In Making Request for Substitution, the Contractor Represents:
1. He has investigated proposed product or method and determined that it is equal or superior in all respects to that specified.
 2. He will provide the same or greater guarantee for substitution as for product specified.
 3. He will coordinate installation of accepted substitution into work, making such changes as required for work to be completed.
 4. He waives all claims for additional costs related to substitution in which it becomes apparent before, during or after installation.
 5. Contractor requesting substitution shall bear additional costs to all parties due to his substitution, including Architect's fees.
- C. Substitutions Will Not Be Considered If:
1. They are indicated or implied on shop drawings or project submittals without formal request.
 2. Acceptance will require substantial revision of Contract Documents.
 3. Not readily serviceable in the area or may cause Shaw's to stock extra parts.

D. Substitutions not approved before the last addendum is distributed shall not be considered in the Base Bid.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01700

PROJECT CLOSEOUT

PART 1 - GENERAL

1.01 FINAL INSPECTION

- A. When the Contractor Considers the Work Is Complete, Contractor Shall Submit Written Certification That:
1. Contract Documents have been reviewed.
 2. Work has been inspected for compliance with Contract Documents.
 3. Work has been completed in accordance with Contract Documents.
 4. Equipment and systems have been tested in the presence of Shaw's representative, are operational, and the instructional meeting is ready to be held.
 5. Floors have been water tested and meet specified and detailed slopes.
 6. Work is completed and ready for final inspection.
- B. Shaw's will make an inspection to verify the status of completion within 7 calendar days after receipt of such certification.
- C. Should Shaw's consider that the work is incomplete or defective:
1. Shaw's will promptly notify the Designer and Contractor in writing, listing the incomplete or defective work.
 2. Contractor shall take immediate steps to remedy the stated deficiencies, and send a second written certification to Shaw's that the work is complete.
 3. Shaw's will re-inspect the work.
- D. When Shaw's Representative finds that the work is acceptable under the Contract Documents, the representative shall request the Contractor to make closeout submittals.

1.02 CLOSEOUT SUBMITTALS

- A. Furnish three (3) bound and indexed copies of an approved operation and maintenance instruction manual covering each item of equipment installed where applicable. These manuals shall provide complete instructions of the proper operation, use and periodic maintenance, together with the source of replacements and service for items covered.
1. Operation and Maintenance Manuals: Contractor shall submit loose leaf maintenance manuals and with an index, for mechanical and electrical equipment, fixtures, finish hardware, equipment, Owner supplied equipment, finishes requiring special treatment, and as otherwise required in specifications. Include a copy of approved shop drawings for these items.
 2. Format:
 - a. Size: 8-1/2" x 11"; punch sheets for standard three-ring binder. Fold larger sheets to fit into binders.
 - b. Binders: Commercial quality, three-ring, with durable and cleanable plastic covers.

- c. Cover: Identify each packet with typed or printed title "Operations and Maintenance Manual." List:
 - Title of Project
 - Name of Subcontractor
 - Name and Address of local parts supplier and service organization.

- B. Record Drawings: Record actual construction on clean set of blackline drawings, suitable for scanning.
 - 1. Depths of various elements of foundation in relation to pavement level.
 - 2. Horizontal and vertical location of underground utilities and appurtenances referenced to permanent surface improvements.
 - 3. Location of internal utilities and appurtenances concealed in construction referenced to visible and accessible features of structure.
 - 4. Field changes of dimension and detail.
 - 5. Changes made by Change Order or Field Order.
 - 6. Details not on original Contract Drawings.
 - 7. Mark-ups on blacklines shall be made in black ink.

- C. Inspection Reports: Subcontractor shall submit certificates from applicable local agencies indicating construction has been inspected as required by laws or ordinances and building is approved for occupancy.

- D. Material Safety Data Sheets: Contractor shall furnish two complete copies for all hazardous substances used during construction.

- E. Valve Tag Schedules: Contractor shall furnish two copies of schedules with close-out documents; mount one copy, framed under glass in Mechanical Room.

- F. Contractor shall coordinate explanations, demonstrations and trial runs of equipment for Owner's designated personnel; complete such demonstrations in accordance with Owner's schedule.

- G. Contractor shall wall mount schedules and drawings specified in Divisions 15 and 16, at approved locations, covered with plexi-glass permanently attached to substrate with screws.

1.03 OPERATING INSTRUCTIONS

- A. Submit to the Shaw's delegated representative WRITTEN and ORAL instructions (by trained personnel) in the care, use, maintenance and operation for each product.

- B. Instructions shall cover a one calendar year cycle of use. Issue instructions in accord with, and in addition to, the "Maintenance Manual".

- C. Insert written operating instructions in "Maintenance Manual".

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION

SECTION 01710

CLEANING

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

- A. Execute cleaning, during progress of the work, and at completion of the work, as required by General Conditions.

1.02 RELATED REQUIREMENTS

- A. Conditions of the contract.
- B. Each Specification Section: Cleaning for specific products or work.

1.03 DISPOSAL REQUIREMENTS

- A. Conduct cleaning and disposal operations to comply with all local codes, ordinances, regulations and anti-pollution laws.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Use only those cleaning materials which will not create hazards to health or property and which will not damage surfaces.
- B. Use only those cleaning materials and methods recommended by manufacturer of the surface material to be cleaned.
- C. Use cleaning materials only on surfaces recommended by cleaning material manufacturer.

PART 3 - EXECUTION

3.01 DURING CONSTRUCTION

- A. Execute periodic cleaning, not less than weekly, to keep the work, the site and adjacent properties free from accumulations of waste materials, rubbish and windblown debris resulting from construction operations.
- B. Provide on-site containers for the collection of waste materials, debris and rubbish.
- C. Remove waste materials, debris and rubbish from the site periodically, and dispose of at legal disposal areas away from the site.

3.02 DUST CONTROL

- A. Clean interior spaces prior to the start of finish painting, and continue cleaning on an as-needed basis until painting is finished.
- B. Schedule operations so that dust and other contaminants resulting from cleaning process will not fall on wet or newly coated surfaces.

3.03 PROGRESSIVE CLEANING

- A. Cleaning during construction is the responsibility of the Contractor. All areas shall be cleaned in a manner acceptable to Shaw's Representative. Two (2) full-time cleaning personnel with tools shall be provided from completion of Sales Area (installation of resilient flooring), until occupation by store operations, whose primary function shall be cleaning the store in a manner acceptable to Shaw's representative.
- B. The Contractor shall seal the entire Sales Area floor prior to installation of Shaw's grocery shelving.

3.04 FINAL CLEANING

- A. Final cleaning before final inspection. Interior and exterior areas of the building shall be cleared of all rubbish and thoroughly cleaned by the Developer/Contractor, including the following:
 - 1. All construction facilities, debris, and rubbish shall be removed from the Owner's property and legally disposed of.
 - 2. All finished surfaces including floors, walls and ceilings shall be swept, dusted, washed, waxed and polished. This includes cleaning of the work of all finished trades where needed, whether or not cleaning for such trades is included in their respective SECTIONS.
 - 3. Pipe and duct spaces, chases, and furred spaces shall be left thoroughly cleaned.
 - 4. All glass and mirrors shall be washed and polished, both sides, by a Window Cleaning Contractor specializing in such work.
 - 5. All ceilings, wall surfaces, floors, door frames, hardware, metal work, glass, enameled metals, and the like, shall be cleaned.
- B. Ventilating Systems:
 - 1. Clean permanent filters. See Section 15885, Filters, for requirements regarding disposable filters.
 - 2. Clean ducts, blowers and coils if units were operated without filters during construction.
- C. Broom clean exterior paved surfaces, rake clean other surfaces of the grounds disturbed by construction.

- D. Prior to final completion or Owner occupancy, Contractor shall conduct an inspection of sight-exposed interior and exterior surfaces, and all work areas, to verify that the entire work is clean.
- E. Final cleaning of resilient flooring including offices and lounge will be washed and waxed by Shaw's. See Section 09650 for initial waxing immediately after flooring installation.

END OF SECTION

SECTION 01740

WARRANTIES AND BONDS

PART 1 - GENERAL

1.01 SUMMARY

- A. Contractor's Requirements: Prepare, assemble and transmit the items listed herein to the Architect as condition precedent of Certificate of Substantial Completion.
- B. Related Sections:
 - 1. Section 01700 - Project Close-out.
 - 2. Each respective section of specifications listing Warranties or Bonds required.

1.02 CONTRACTOR'S SUBMITTALS

- A. Requirements:
 - 1. Assemble warranties, bonds, service and maintenance contracts, and Subcontractor data.
 - 2. Number of Original Signed Copies Required: Four each.
 - 3. Table of Contents: Type neatly in orderly sequence. Provide complete information for each item.
 - a. Product or work item.
 - b. Firm name, principal name, address, and telephone number.
 - c. Scope.
 - d. Date of beginning of warranty, bond, or service maintenance contract.
 - e. Duration of warranty, bond, or service maintenance contract.
 - f. Provide information for Owner's personnel:
 - 1 Proper procedure in case of failure.
 - 2 Instances affecting validity of warranty or bond.
 - g. Subcontractor, name of responsible principal, address, and telephone number.
- B. Form:
 - 1. Prepare in quadruplicate packets.
 - 2. Format:
 - a. Size: 8-1/2" by 11"; punch sheets for standard three-ring binder. Fold larger sheets to fit into binders.
 - b. Binders: Commercial quality, three-ring, with durable and cleanable plastic covers.
 - c. Cover: Identify each packet with typed or printed title "WARRANTIES AND BONDS". List:
 - 1. Name of Subcontractor
 - 2. Title of project
 - 3. Name and address of local parts supplier and service organization.

PART 2 - PRODUCTS (Not Applicable)

PART 3 -- EXECUTION (Not Applicable)

END OF SECTION

SECTION 02060

BUILDING DEMOLITION AND ALTERATIONS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Demolish portions of structure indicated.
- B. Remove materials and equipment from site.
- C. Cap and identify active utilities.
- D. Remove materials for relocation.

1.02 SUBMITTALS

- A. Permits and notices authorizing building demolition.
- B. Owner's permission for severance of utility services.
- C. Owner's permission for interruption of building egresses.
- D. Permit for transport and disposal of debris.
- E. Demolition procedures, operational sequence, for review and acceptance by Architect and Shaw's.

1.03 PROTECTION

- A. Do not interfere with use of adjacent buildings. Maintain free and safe passage to and from.
- B. Prevent movement or settlement of structure. Provide and place bracing and be responsible for safety and support of structure. Assume liability for such movement, settlement, damage, or injury.
- C. Cease operations and notify Architect immediately if safety of existing structure appears to be endangered. Take precautions to properly support structure. Do not resume operations until safety is restored.
- D. Prevent movement, settlement or collapse of adjacent services, sidewalks, roads, driveways and trees. Assume liability for such movement, settlement or collapse. Promptly repair damage at no cost to the Owner.
- E. Provide, erect and maintain barricades to protect general public, workers, and adjoining property. See Section 01535 for additional requirements.

1.04 EXISTING SERVICES

- A. Arrange and pay for disconnecting or interrupting utility services. Notify the affected utility company in advance and obtain approval before starting this work.

1.05 MAINTAINING TRAFFIC

- A. Do not close or obstruct roadways without permits.
- B. Conduct operations with minimum interference to public or private roadways.

1.06 JOB CONDITIONS

- A. The Contractor shall inspect the premises, prior to submittal of proposal, for verification of existing conditions which will affect the work.
- B. All demolition and removal of debris shall not interfere with Shaw's operations. The store will continue in operation throughout demolition and construction. When demolition work affects Shaw's operations, work must be coordinated and scheduled in advance.
- C. Provide necessary protections including temporary enclosures and ramps to insure the safe passage of persons around the area of demolition. Conduct operations to prevent damage to adjacent buildings, structures and other facilities as well as persons.
- D. Promptly repair damages caused to adjacent facilities by demolition operations, as directed by the Architect and at no cost to Shaw's.
- E. The Owner assumes no responsibility for the actual condition of the structure.
- F. All surfaces and materials exposed after removal shall be protected from the elements.

1.07 PERMITS

- A. The Contractor shall provide all permits required by local governing authorities for removal and disposal of all demolition materials.

1.08 DEMOLITION

- A. The Contractor shall use water sprinkling, temporary enclosures, and other suitable methods as necessary to limit the amount of dust and dirt rising and scattering in the air, to the lowest level of air pollution practical for the condition of work. The Contractor shall comply with all governing regulations.
 - 1. Do not use water when it may create hazardous or objectionable conditions such as ice, flooding or pollution.
 - 2. Provide siltration barriers around existing drainage catch basins within the contract area as necessary.
- B. Proceed with demolition in a systematic manner.
- C. Demolish in small sections and remove structures and materials where indicated on the drawings and as scheduled in the construction schedule.

1.09 DISPOSAL OF DEMOLISHED MATERIALS

- A. At regular intervals, remove from the site all debris, rubbish and other materials resulting from demolition operations, and legally dispose of off the site. Storage or sale of demolished materials to be removed will not be permitted on the site.
- B. Burning of removed materials from demolished structures will not be permitted on the site.

1.10 CLEANING-UP

- A. Clean adjacent structures and improvements of all dust, dirt and debris caused by demolition operations, as directed by Shaw's. All areas not cleaned will be cleaned by Shaw's and back charged to the Contractor.

1.11 SEQUENCE OF OPERATIONS

- A. The Contractor shall submit for approval the complete sequence of operations for demolition and show how it is coordinated with all other aspects of the job. Work shall be not begin until such a schedule has been approved by Shaw's.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Except where noted otherwise, maintain possession of materials being demolished. Immediately remove from site.
- B. Relics and antiques (i.e., cornerstones and their contents, commemorative plaques, and tablets) and similar objects, remain the property of the Owner. Notify Architect prior to removal and obtain acceptance regarding method of removal.

PART 3 - EXECUTION

3.01 DEMOLITION AND ALTERATIONS

- A. Demolish structure and appurtenances in an orderly and careful manner. Remove materials from site.
- B. Perform demolition in accordance with applicable authorities having jurisdiction.
- C. Repair demolition performed in excess of that required, at no cost to the Owner.
- D. All existing mechanical, plumbing and electric items that are disconnected and not reused shall be removed from the site.

- E. The existing roof shall be made watertight at end of each work day by temporary coverings or installed roofing membrane. Damage to existing structures from water damage caused by work under this Contract shall be repaired at no additional cost to the Owner.
 - 1. Contact manufacturer of existing roof membrane, and follow manufacturer's requirements to maintain warranty.
- F. Remove demolished materials, tools and equipment upon completion of work. Leave site in condition acceptable to Architect.
- G. Where concrete slab is to be removed, it may be broken out except in areas where new slabs are to butt old slab or reinforced slab is to be modified. At these locations, a saw cut joint is required. Core drill existing slabs or walls as required for the installation of new piping and conduit.
- H. Shaw's present operations require clean conditions. Therefore, the Contractor shall take extreme care to keep all areas dust free and shall provide dust partitions where required by Shaw's.
- I. Adequate protection of persons and property shall be provided at all times, including dust partitions and steel plates (1/2" min. thick) over holes in ground or slabs. All work shall be executed in a manner to avoid interference with the use of adjacent buildings, areas or properties, and to avoid interruption of free passage to or from such buildings, areas or properties.
- J. Excavate for new utilities under slabs. Do not undermine edges of slabs to remain. Compact backfill to 95% compaction in 6" lifts.
- K. Core Drilling and Saw Cutting: Do all drilling and cutting required for the work. Penetrations shall be fully planned and coordinated by the Contractor. Vacuum up water created by cutting operations to prevent damage to materials to remain.

3.02 BRACING

- A. Locate bracing to clear columns, and other permanent work. If necessary to move a brace, install new bracing prior to removal of original brace.
- B. Do not place bracing where it will be cast into or included in permanent work, except as otherwise acceptable to Architect.
- C. Install internal bracing, if required, to prevent spreading or distortion to braced frames.
- D. Maintain bracing until structural elements are rebraced by other bracing or until permanent construction is able to withstand pressures.

3.03 REPAIR

- A. Repair damage to existing structure caused as the result of this work at no additional cost to Owner.

3.04 CONTINUITY OF SERVICES

- A. Before shutting down or discontinuing any utility, including water, power, sewer, telephone and heat, notify the Owner at least 72 hours in advance and coordinate with the Owner's schedule. Shutdowns affecting the existing building shall be identified in the construction schedule and be done during hours of little or no use by the Owner.

3.05 PATCHING

- A. Patch holes, marks and irregular areas left by removals to match surrounding surfaces. Holes in walls and floors above ceilings shall be filled with materials to match wall for sound control.
- B. Where exposed walls to remain are patched and painting of the space is not indicated in the Room Finish Schedule, the entire wall from floor to ceiling shall be painted, extending to a full height vertical break at adjacent walls each side of patch.
- C. Make slab cuts for new utilities and the work. Fill with concrete to match surrounding surfaces. Finish surface shall be smooth and level and shall not telegraph through floor covering.

END OF SECTION

SECTION 02200

EARTHWORK

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Provide labor and materials to complete the earthwork within the limit of work as shown on the Drawings and/or herein specified.
 - 1. Protection.
 - 2. Excavation:
 - a. General excavation to lines and grades indicated.
 - b. Trench excavation for footings, piers, etc.
 - c. Excavation for buried pipes, wires and conduits under ground floor.
 - d. Excavation for buried structures, pipes, wires and conduits outside the building.
 - 3. Filling and backfilling for excavations, including furnishing of extra material required.
 - 4. Compacted gravel under building.
 - 5. Compacted gravel for walks.
 - 6. Shoring, bracing, sheathing, and cribbing as required and removal of the same.
 - 7. Pumping of excavation as may be required.
 - 8. Crushed stone.

1.02 SUBMITTALS

- A. Submit manufacturer's product literature and test results for approval on all materials in accordance with Section 01300.

1.03 PROTECTION

- A. Excavation, sidewalks, trenches, etc., shall be kept properly fenced and guarded. Lights shall be provided and maintained wherever and whenever necessary.
- B. Shoring: Do shoring, bracing, etc., necessary to support soil adjoining the excavation and protect adjacent buildings. The same shall be removed when directed.
- C. Protect newly filled areas from traffic and erosion. Repair and re-establish grades to the specified tolerances in settled, eroded and rutted areas. Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify the surface, re-shape and compact to the required density prior to further construction.

1.04 QUALITY ASSURANCE

- A. Compaction Control: Wherever a percentage of compaction for backfill is indicated or specified, it shall be the in-place dry density divided by the maximum dry density and multiplied by 100.

- B. The maximum dry density shall be the dry density at optimum moisture as determined by ASTM D 1557-91 "Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort," latest revision. Method A, B or C shall be selected by the testing agency based on the gradation results of the sample taken. Adjustments to the laboratory density for oversize aggregate shall be made (if required) as specified in ASTM D 1557-91. These adjustments shall be made in accordance with ASTM D 4718-87, latest revision.
- C. The in-place density shall be determined in accordance with ASTM Standard Method of Test for Density of Soil in Place by the Sand Cone Method, Designation D 1556; or density of soil and soil aggregate in-place by nuclear methods (shallow depth), Designation D2922.
- D. Materials used on-site are subject to the approval of the Architect and Geotechnical Engineer, and unsuitable materials shall be removed from the site.

1.05 MEASUREMENTS AND CLASSIFICATION

- A. Measurements: Measurements used for calculating amounts of excavation shall be within a vertical line placed 2'-0" outside the wall or 1'-0" outside footing, whichever is greater, and to the depth indicated. Trench excavation for underground utilities shall be based on a trench width 2'-6" greater than the diameter of the pipe with vertical walls, and the depth of 4" below the pipe. All excavation shall be taken to a minimum of 1'-0" below finish floor, and slabs on grade.
- B. Classification:
 - 1. Earth excavation includes any and all material not having the qualities to classify as rock excavation.
 - 2. Rock excavation includes the satisfactory removal and disposal of rock material which cannot be removed without systematic drilling and blasting or by pneumatic methods. This includes rock material which is in ledges, bedded deposits, unstratified masses, and conglomerate deposits which are so firmly cemented that they possess the characteristics of solid rock. Boulders will be included only if each is two (2) cubic yard size or greater and cannot be excavated without drilling and blasting or pneumatic splitting. When, during the progress of excavation, ledge is encountered, the Architect and Geotechnical Engineer shall be notified. Adjustments will be by unit price. The Architect or Geotechnical Engineer shall determine the extent of rock excavation and classification.
 - 3. The unit price for rock excavation is net and is not subject to credit for any other material which it may replace.
 - 4. Excavation which measures 6'-0" or less in width, regardless of length, shall be classified as trench excavation. Measurements to be determined as outlined herein.
 - 5. Excavation which does not meet the above requirements for trench excavation shall be classified as open excavation.
 - 6. The Owner will take credit for excavation omitted through changes in the Plans and/or Specifications at the unit price stated.

- C. Rock excavation shall not be included under the basic Contract Price. Ledge excavation required for the building project will be paid for on the basis of unit prices set forth in the Bid Form. The extent of such ledge will be determined by the Architect and Geotechnical Engineer, with ledge contour survey provided by the Contractor.

1.06 SOIL TESTING

- A. Soil compaction control including laboratory testing, on site testing, and geotechnical inspection will be done by a testing agency hired by the Owner.
- B. Provide samples of each fill material from the proposed source of supply. Allow sufficient time for testing and evaluation of results before material is needed. Submit samples from alternate sources if proposed material does not meet the specifications. Submit test results to the Architect.
- C. Tests of soil as delivered may be performed from time to time. Materials in question may not be used, pending test results. Remove rejected material and replace with new, approved soil.
- D. Cooperate with the laboratory in obtaining field samples of in-place, bank-run, or stockpiled materials. Samples should be obtained by laboratory personnel from various suppliers, but other individuals may obtain and deliver samples if approved by the Architect.
- E. Coordinate schedule with testing agency and Architect to allow testing agency representative to be on site prior to foundation formwork and at the start of filling operations.
- F. The Contractor shall bear cost of all retesting when initial test results indicate non-compliance with specifications, or when alternate sources are submitted.
- G. In-Place Compaction Test Frequency for Each Layer Placed: Subgrade, proof-compact building and paved areas: 1 test per 2,000 sq. ft.
 - 1. Building interior fill: 1 test per 2,000 sq. ft.
 - 2. Parking, roads and walks: 1 test per 500 sq. ft.
 - 3. Trench - utilities: 1 test per 50 lin. ft.

PART 2 - PRODUCTS

2.01 GRAVEL BASE AND SUB-BASE

- A. Clean screened or crushed gravel free from organic material or clay. The portion that passes a 3" sieve shall conform to the following gradation requirements:

<u>SIEVE SIZE</u>	<u>% PASSING</u>	
	<u>Base</u>	<u>Sub-Base</u>
2"	100	-
1"	80 - 100	50 - 100
1/2"	35 - 75	-
1/4"	25 - 60	25 - 70
#40	0 - 25	0 - 30
#200	0 - 5	0 - 5

- B. Maximum size stone for base passes 2" sieve. Maximum size stone for sub-base passes 4" sieve.
- C. Gradations in the table represent the limits which shall determine suitability of gravel for use from the sources of supply. The gradations shall be uniformly graded from course to fine within the limits designated in the table and shall not vary from the low limit on one sieve to the high limit on the adjacent sieves, or vice versa.

2.02 GRANULAR BEDDING MATERIAL

- A. Clean Sand or Gravel Free from Organic Material or Clay Conforming to the Following Gradation:

<u>Sieve Size</u>	<u>Percent Passing</u>
2"	100
1/4"	25 - 100
#40	0 - 30
#200	0 - 7

2.03 CRUSHED STONE

- A. Screened or crushed natural stone, free from shale, organic matter and debris conforming to the following gradation: (ASTM C-33 Size No.56)

<u>SIEVE SIZE</u>	<u>PERCENT PASSING</u>
1"	100
3/4"	90 - 100
1/2"	10 - 50
3/8"	0 - 20
#4	0 - 5

PART 3 - EXECUTION

3.01 SITE PREPARATION

- A. Debris shall be removed from the site and deposited in suitable disposal areas obtained by the Contractor at his expense. Conform to all Federal, State and local solid waste disposal regulations.

3.02 DISPOSAL

- A. Dispose of unsuitable material, organic material, wood waste, rock material, and surplus excavated soil in excess of that required for rough grading off the site in a disposal area obtained by the Contractor. Conform to all Federal, State and local solid waste disposal regulations.
- B. If hazardous waste or special waste as defined by the U. S. Environmental Protection Agency or State Department of Environmental Protection is encountered during excavation, the Contractor shall avoid disturbance of that material, and shall notify the Owner immediately. The State Bureau of Oil and Hazardous Waste Control must be notified and consulted prior to disturbance of the waste or contaminated soil. Removal and disposal of contaminated materials is not included in the Contract Bid, since it must be handled as directed by the regulatory agencies on a case-by-case basis.

3.03 REMOVAL OF EXISTING BITUMINOUS PAVEMENT

- A. Where it is necessary to excavate and make cuts in bituminous pavement, the Contractor shall saw cut paving along neat straight lines where new pavement meets existing pavement.
- B. Dispose of excavated pavement in suitable off-site disposal area obtained by the Contractor.

3.04 EXCAVATION

- A. Excavation shall be made to the proper depths with the proper allowance for forms, etc. Excavation shall be approximately level, clean and clear of loose material. Debris, rock material, concrete foundations, organic material, or unsuitable material encountered in the excavation shall be removed and disposed of as specified above. Excavation shall be carried to depth required by design. Over-excavation beyond the design limits, made without authorization from the Owner or Geotechnical Engineer, will be refilled with gravel subbase material compacted to 95% maximum dry density at the Contractor's expense.
- B. Excavate the area within the building lines level to 12" beneath the bottom of the floor slab. Exercise extreme caution during excavation to minimize disturbance of the subgrade soils. This will require excavation in dry weather, use of smooth bucket excavator (without teeth), limiting traffic on the exposed soil, and dewatering below subgrade. Proof-roll the sub-grade, unless in clay soils. Excavate for footings to 6" below the bottom of the footing.
- C. If bearing is not suitable at levels shown on the Drawings, the Architect or Geotechnical Engineer shall be notified so that adjustments in level or changes may be made immediately. The Geotechnical Engineer will set the limits of excavation of rock, loose fill, organic material, or other unsuitable material. Allowance for over-excavation of rock or other unsuitable material and replacement with gravel subbase or concrete will be made under the unit prices listed in the Bid Form, when the over-excavation has received prior approval from the Owner or Geotechnical Engineer.
- D. When explosives are used for rock removal, the work shall be done by experienced powdermen, using small charges in strict accordance with regulations covering this type of work. Blasts shall be properly covered, using blasting mats. Damage to the structure caused by improper use of explosives shall be corrected at the Contractor's expense. No blasting work is allowed without written approval of the Owner.
- E. Draining of Excavation: The Contractor shall, by use of pumps, or other approved means as may be necessary, prevent the accumulation of water in the excavated areas.
- F. Prior to excavation, obtain confirmation from the Owner and Utility Company that all buried utilities are located accurately on the Drawings and in the field.

3.05 FILLING AND COMPACTION

- A. General:
 - 1. Fill shall be compacted in 6" to 12" layers to avoid settlement. In filling against walls or pipelines, the fill shall be placed and compacted on both sides at the same time to avoid undue strain.

2. Compact fill under pavements to 95% of maximum dry density and under grass or mulch areas to 90% of maximum dry density.
3. Additional material necessary to complete the filling shall be furnished by the Contractor.
4. Place gravel base material under concrete pads and walks a minimum of 12" deep, compacted to 95% maximum dry density.
5. Fill above underdrain wrap with gravel base for full depth to ground surface.

B. Inside Building Lines:

1. Prior to placing any concrete or soil, obtain approval of the exposed subgrade soil from the Geotechnical Engineer.
2. Fill from bottom of excavation to within 12 inches of the bottom of the slab with gravel sub-base material. Place a 12-inch layer of gravel base material directly under the slab, following filling of interior trenches. Compact material in 6" to 12" layers, watered to optimum moisture content, to 95% maximum dry density.
3. Fill shall be placed under direct observation of a Geotechnical Engineer. Fill placed without the presence of the Geotechnical Engineer shall be removed and refilled under his observation.
4. Place footings on at least a 6" layer of compacted gravel subbase material, placed on undisturbed soil subgrade exposed by excavation.
5. Where ledge rock is encountered at footing grade, excavate rock 12" deeper and place footing on a 12" layer of gravel subbase material.

C. Roads, Parking Lots and Walks:

1. Prepare subgrade to proper grade and proof-roll to 95% maximum dry density. Place fill in 6" to 12" layers compacted to 95% maximum dry density.
2. Place gravel base in 6" to 12" layers compacted to 95% maximum dry density.

D. Sewer, Water, or Storm Drain Lines:

1. Bed plastic, metal, or concrete pipes on 4-inch layer of granular bedding material compacted to 95% maximum dry density. Fill to 12 inches over the top of pipe with granular bedding material compacted to 95% maximum dry density. Fill remainder of trench with excavated materials compacted to 95% maximum dry density beneath building slabs, slabs on grade and paved areas; or compacted to 90% maximum dry density beneath grassed or mulched areas.
2. Ductile iron pipe may be placed directly on the prepared subgrade shaped to provide uniform bearing along the entire pipe length, and backfilled with excavated material with no rocks larger than 4-inch diameter within 12 inches of the pipe; compaction as described above.
3. Provide an 8-inch bedding layer between pipes and ledge rock.

- E. Underslab Utilities: Surround underslab piping and conduit with 6 inches of granular bedding material, compacted to 95% maximum dry density.

END OF SECTION

SECTION 02700

UNDER DRAINAGE

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Provide labor and materials to complete the drainage as shown on the Drawings and/or herein specified.
 - 1. Underdrains, including foundation drains.
 - 2. Geotextile filter fabric.

1.02 SUBMITTALS

- A. Submit manufacturer's product literature and Shop Drawings for approval on materials in accordance with Section 01300.

PART 2 - PRODUCTS

2.01 UNDERDRAINS

- A. Use One of the Following for Underdrains:
 - 1. Polyvinylchloride (PVC), Type PS-46 or PSM (SDR 35) perforated with two rows of 1/2-inch diameter holes. Gasketed push-on joints.
 - 2. Corrugated polyethylene drainage pipe, heavy-duty grade, perforated, conforming to AASHTO M252 and ASTM F 405. Pipe must be marked as "Heavy-Duty" conforming to ASTM F405, or pipe stiffness of 30 psi at 5% deflection, maximum of 5% elongation.
- B. Provide cleanout risers to finish grade with threaded covers. Provide cleanout plug inside a cast iron or aluminum hand hole and cover set flush to walkway or drive pavement, where cleanout is in a hard-surface area outside the building. Inside the building use cleanouts as specified in Section 15400, Plumbing.

2.02 GEOTEXTILE DRAINAGE FABRIC

- A. Polypropylene or polyester non-woven, needle-punched drainage fabric with the following minimum properties:

Weight	4.5 oz/sy	Water Flow Rate	280 gpm/sf
Thickness	60 mils	Coef of Permeability	0.2 cm/sec
Tear Strength	50 lbs	Equiv. Opening Size	70-100 sieve

- B. Mirafi 140N, Terra Tex - SD, Trevira 1115, AEF 480, or approved equal.

PART 3 - EXECUTION

3.01 EXCAVATION AND BACKFILL

- A. Conforming to the appropriate portions of Section 02200, Earthwork.

3.02 UNDERDRAINS

- A. Set drains in 18"wide by 18" high crushed stone bedding, with stone fully surrounding pipe, with perforations on the bottom half of the pipe. Slope pipe uniformly to drain. Fully wrap stone bedding with Geotextile fabric. Compact to 95% maximum density around pipe.

END OF SECTION

SECTION 03300

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Furnish and install cast-in-place concrete work.

1.02 REFERENCES

- A. "Manual of Standard Practice" of the Concrete Reinforcing Steel Institute
- B. ACI 318-83 - Building Code Requirements for Reinforced Concrete
- C. ACI 302 - Guide for Concrete Floor and Slab Construction
- D. ACI 305R-77 (R1982) - Hot Weather Concreting
- E. ACI 306R-78 - Cold Weather Concreting
- F. ACI 347-78 Recommended Practice for Concrete Formwork
- G. CRD-C621-83 - Specification for Non-Shrink Grout
- H. ASTM A 185-85 - Steel Welded Wire Fabric, Plain, For Concrete Reinforcement
- I. ASTM A 615-86 - Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
- J. ASTM C 31-85 - Making and Curing Concrete Test Specimens in the Field
- K. ASTM C 33-86 - Concrete Aggregates
- L. ASTM C 94-86a - Ready-Mixed Concrete
- M. ASTM C 143-78 - Slump of Portland Cement Concrete
- N. ASTM C 150-85a - Portland Cement
- O. ASTM C 172-82 - Sampling Freshly Mixed Concrete
- P. ASTM C 173-78 - Air Content of Freshly Mixed Concrete by the Volumetric Method
- Q. ASTM C 231-82 - Air Content of Freshly Mixed Concrete by the Pressure Method
- R. ASTM C 260-86 - Air-Entraining Admixtures for Concrete
- S. ASTM C 309-81 - Liquid Membrane-Forming Compounds for Curing Concrete
- T. ASTM C 494-86 - Chemical Admixtures for Concrete

- U. AWS D1.4-9 - Structural Welding Code - Reinforcing Steel
- V. ASTM D 994-71 - Preformed Expansion Joint Filler for Concrete (Bituminous Type)
- W. CTCB - Concrete Testing Certification Board

1.03 SUBMITTALS

- A. Submittals shall be in accordance with 01300.
- B. Submit concrete mix design(s), concrete tests, and manufacturer's descriptive literature for materials specified at least 14 calendar days before placement.
- C. Submit Shop Drawings for fabrication, bending, and placement of concrete reinforcement. Comply with ACI 315 "Manual of Standard Practice for Detailing Reinforced Concrete Structures" showing bar schedules, stirrup spacing, diagrams of bent bars, arrangement of concrete reinforcement. Include special reinforcement required and openings through concrete structures.

1.04 PRE-CONCRETE CONFERENCES

- A. At least 15 days prior to submittal of design mixes, the Contractor shall hold a meeting with all concerned parties to review the detailed requirements for preparing the design mixes and to determine proper concrete construction procedures.
- B. The concrete floor slab is especially important to Shaw's. The Contractor shall take special care in design and construction of slabs on grade. A pre-concrete slab meeting is required one week before placing slab on grade. All contractors and designers connected with the slab, including the following shall be present:
 - General Contractor
 - Project Manager
 - General Contractor Superintendent
 - Slab Finish Contractor
 - Concrete Supplier
 - Plumber
 - Electrician
 - Architect and Engineer
 - Shaw's Project Representative
- C. Concrete slabs shall be installed in strict accordance with the current edition of Portland Cement Association, Concrete Floors on Ground unless specified otherwise.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Forms for Exposed Concrete: New plyform (or of equivalent quality) or shall be lined.
 - 1. Other forms shall be plyform, matched lumber or steel.

- B. Steel Reinforcement: Deformed bars complying with the requirements of ASTM A-615, Grade 60, unless otherwise indicated, and of domestic manufacture. Mesh reinforcement shall conform to the requirements of ASTM A185.
- C. Metal Accessories: Shall include all spacers, chairs, ties and other devices for properly spacing, supporting and fastening reinforcement in place.
1. Use cone type ties at exposed locations to allow for formed hole for filling and pointing.
 2. Dowels (For Exposed Slab Areas): Square dowels with sawn ends (sheared bars not acceptable); dowel sleeve shall be Expando-Lok, 3/4" x 12" long, plastic sleeve with 3/16" thick polyethylene foam on vertical legs to allow for lateral slab movement; Century Floors (207) 946-5697.
- D. Cement: Portland cement of North American manufacture conforming to the requirements of ASTM C-150, Type II. Use only one brand of cement throughout the project.
- E. Concrete Aggregates: Shall conform to the requirements of ASTM C-33.
1. Fine Aggregate: Sand shall consist of hard, tough and preferably siliceous material, clean, free from mineral or other coatings, soft particles, clay, loam or other deleterious matter.
 2. Coarse Aggregate: Crushed stone or gravel, having clean, hard, durable, uncoated particles, free from deleterious matter. The 1-1/2" aggregate shall conform to gradation #467 and the 3/4" aggregate to size #67 in Table II of ASTM C-33. 3/4" aggregate shall be used for structural slabs, lintel beams, and any other location where 3/4 of the clear space between reinforcing bars or between bars and the forms require this size aggregate.
- F. Admixtures:
1. Water Reducing Admixture: "Eucon 75" by The Euclid Chemical Company, "Pozzolith 200N" by Master Builders, WRDA with Hycol by Grace Construction Products, or Plastocrete 160" by Sika Chemical Corporation. The admixture shall conform to ASTM C494, Type A, and shall be chloride free.
 2. Water Reducing, Retarding Admixture: "Eucon Retarder-75" by The Euclid Chemical Company, "Daracem-100" by W. R. Grace "Pozzolith 100XR" by Master Builder, "Daratard-17" by W. R. Grace or "Plastiment" by Sika Chemical Corporation. The admixture shall conform to ASTM C494, Type D and shall be chloride free.
 3. High Range Water Reducing Admixture (Superplasticizer): "Eucon 37" by The Euclid Chemical Company, "Daracem-100" by W. R. Grace or "Sikament" by Sika Chemical Corporation. The admixture shall conform to ASTM C494, Type F or G, and shall be chloride free.
 4. Non-Corrosive, Non-Chloride Accelerator: "Accelguard 80" by The Euclid Chemical Company, "draset" by W. R. Grace, or approved equal. The admixture shall conform to ASTM C494, Type C or E, and not contain more chloride ions than are present in municipal drinking water. The admixture manufacturer must have long term non-corrosive test data from an independent testing laboratory (of at least a year's duration) using an acceptable accelerated corrosion test method such as that using electrical potential measures.

5. Air Entraining Admixture: Conform to ASTM C260, "Darex AEA" as manufactured by The Construction Products Division of W.R. Grace & Co., or approved equal. Provide Vinsol resin admixture equal to Darex "Daravair" for concrete containing super-plasticizer.
 6. Prohibited Admixture: Calcium chloride, thiocyanates or admixture containing more than 0.05% chloride ions are not permitted.
 7. Fiber Reinforcing: Nycom, nylon fibers, 3/4 inch fiber length, 1 lb. per cubic yard; Fiber Mesh, or Grace Fibers, virgin polypropylene; 1.5 lb. per cubic yard.
- G. Repair Materials:
1. Bonding Compound: Powercrete "Powerprep AC," water-based two-component system with 24-hour open time before recoating is required.
 2. Epoxy Adhesive: The compound shall be a two (2) component, 100% solids reactive compound suitable for use on dry or damp surfaces, "Euco Epoxy #463 or #615" by The Euclid Chemical Company or "Sikadur Hi-Mod" by Sika Chemical Corporation.
 3. Patching Mortar: Free flowing polymer modified cementitious coating, "Euco Thin Coat" by The Euclid Chemical Company, "Sikatop 121" by Sika Chemical Corporation, or Five Star" Structural Concrete."
 4. Underlayment Compound: Free flowing, self-leveling, pumpable cementitious base compound, "Flo-Top" by The Euclid Chemical Company, or approved equal..
- H. Curing/Sealer Compound: Ashford Formula manufactured by Curecrete Chemical Company.
- I. Curing Compound: Euco Aqua-Cure Vox by the Euclid Chemical Co.; low odor.
- J. Curing Paper: Water, reinforced paper; "Orange Label Sisalkraft," as manufactured by the American Sisalkraft Corporation, "Scuf-Champ," as manufactured by Ludlow Papers, "Flor-Cur W/S," as manufactured by Glas-Kraft, or approved equal.
- K. Non-Shrink Grout: "Euco N-S" by the Euclid Chemical Company; "Master-Flow 928" (non-metallic) by Master Builders, Five Star Grout, Dayton Superior Sure Grip Grout, or Sika Grout 212. The grout shall conform to CRD C-621, type b or d.
1. Grout used for setting items in sleeves cast into concrete shall be Por-Rok exterior anchoring cement.
- L. Moisture Barrier: "J" Pro VaporShield or Tu Tuff 4.
- M. Compressible Material: Expanded polystyrene with a density of one pound per cubic foot.
- N. Asphalt Expansion Joint: 3/8" thick asphalt expansion joint filler meeting ASTM D994, manufactured by W. R. Meadows, J & P Petroleum Products Inc., or approved equal.
- O. Richmond Dowel Bar Substitution and Splice System (Size as Indicated):
1. Female Ends: DB-SAE dowel bars.
 2. Male Ends: Dowel-in.

2.02 MIXES

A. Grade and Strength:

1. Concrete Requirements:

	Minimum (PSI) Compressive Strength 28 Days	Water-Cement Ratio-Maximum	Maximum Aggregate Size	Minimum Cement Content
Exterior Slabs on Grade, Utility Pads	4000	.44 unless speci- fied otherwise	3/4"	564 lbs/yd
Reinforced Walls, Footings, Pads,	3000	.50 unless speci- fied otherwise	3/4"	517 lbs/yd
Interior Slabs - fiber reinforced	3000	.54 unless speci- fied otherwise	1-1/2"	480 lbs/yd

2. Concrete shall contain the specified water reducing admixture, water reducing retarding admixture or the specified high range water reducing admixture (super-plasticizer). All concrete slabs, placed at air temperatures below 50EF, shall contain the specified non-corrosive, non-chloride accelerator. Add admixtures in dosage recommended by the admixture manufacturer. All concrete required to be air-entrained shall contain an approved air entraining admixture.
3. Prior to starting construction, submit proposed mix design, accompanied by complete standard deviation analysis or trial batch data. No change in source of materials or mix shall be made without Architect's approval.

B. The concrete mix designs shall be proportioned in accordance with Section 4.3 "Proportioning on the Basis of Field Experience or 4.4 Trial Mixture" of ACI 318-83. The proportions of ingredients shall be such as to produce a mixture which will work readily into the corners and angles of the forms and around reinforcement by the methods of placing and consolidation employed on the work, but without permitting the materials to segregate or excessive free water to collect on the surface.

C. The approved air-entraining admixture shall be used in concrete exposed to weather to obtain proper percentages of air-entrainment as follows:

Maximum Size Aggregate	Entrained Air
3/8"	7 ± 1%
3/4"	5-1/2 ± 1%
1-1/2"	5 ± 1%

PART 3 - EXECUTION

3.01 PREPARATION

A. Forms:

1. Forms shall be substantial and tight, properly braced and tied so as to maintain position and shape. Wire ties shall not be permitted.

2. Joints in forms shall be made sufficiently tight to prevent leakage of concrete.
3. Before placing the reinforcing steel or the concrete, the form surface shall be covered with a release agent that will effectively prevent absorption of moisture, prevent bond with the concrete, and will not stain the concrete surfaces.

B. Mixing:

1. Mix the concrete in quantities required for immediate use, and any which has developed initial set, or which does not reach the forms within 1-1/2 hours after water has been added, shall not be used.
2. Mix all concrete by machine, having a capacity of not less than "one bag batch" of concrete.
3. Ready-mixed concrete shall be mixed and delivered by the means and standards set forth by ASTM C-94.
4. When concrete is mixed in a truck mixer loaded to its maximum rated capacity, the number of revolutions of the drums or blades at mixing speed shall be not less than 70 nor more than 100.
5. When a truck mixer or agitator is used for transportation, complete placement within 1-1/2 hours or before the drum has revolved a total of 300 revolutions, whichever comes first, after the introduction of mixing water.
6. Measurements:
 - a. By Weight: Only weighing equipment approved by the Architect shall be allowed. The equipment shall be platform-operated, and the weighing beam or dial shall be in full view of the operator. The equipment shall be capable of measurement within + 1% for the cement and water, + 2% for the aggregates, and + 3% for the admixtures. The cement and aggregates must be weighed by the weight.
 - b. By Volume: The admixtures shall be measured by volume. Water may be measured by weight or volume.
 - c. All Methods: The methods of measuring concrete materials shall be such that the proportion of water to cement can be accurately controlled during the progress of the work and easily checked at any time.
7. Placeability: The placeability (consistency or workability) of the characteristics of the ingredients, air content, slump and proper mixing. The placeability of the concrete mix shall be at all time, as the Architect may direct. Concrete containing the specified high range water reducing admixture (superplasticizer) shall have a maximum slump of 8" unless otherwise approved by the Architect. The maximum slump of other concrete shall be:

	Slump	
	Max.	Min.
Reinforced Foundations - walls and footing	4	2
Slabs on grade	4	2

The concrete shall arrive at the job site at specified slump, be verified, then the high range water reducing admixture added to increase the slump to the approved level. Superplasticizer shall not be added until concrete has been checked for initial slump. All site added super-plasticizer shall be done in the presence of Field Representative.

8. Temperature of Concrete: The temperature of concrete when it is being placed shall be not more than 80EF., and not less than 40EF. Concrete ingredients shall not be heated to a temperature higher than necessary to keep the temperature of the mixed concrete, as placed, from falling below the specified 50EF. Methods of heating and cooling concrete ingredients shall be subject to approval.
 - a. When the temperature of the concrete as placed may exceed the specified 80EF., the concrete shall be mixed at the job site and discharged into the work immediately after mixing. If concrete is placed when the weather is such that the temperature of the concrete would exceed 80EF., as determined by the Architect, the Contractor shall employ such effective means as are necessary to maintain the temperature of the concrete as it is placed below 80EF. Pre-cooling of aggregates and mixing water adding chip or flake ice to the mixing water or a combination of these or other approved means. The Contractor shall be entitled to no additional compensation on account of the foregoing requirement.
 - b. Option: When the temperature of the concrete as placed may exceed 80EF., the Architect may require the use of the water reducing retarding admixture type D to the delay initial set and heat of hydration.
- C. Previous to placing concrete, clean all equipment used for mixing and transporting the concrete; remove all debris from the place to be occupied by the concrete; check forms for dimensions, position and adequacy, and oil the forms with a non-staining oil. Masonry filler units which will be in contact with concrete and the surface of earth on which concrete is to be placed, shall be wetted without having free standing water on the surfaces; and the reinforcement and embedded structural steel shall be thoroughly cleaned of dirt, paint or other coatings.

3.02 INSTALLATION

- A. Accurately position reinforcing as shown and secure against displacement by using at intersection and splices annealed iron wire ties of not less than #18 gauge or suitable clips.
 1. The bending of reinforcing to conform to the dimensions shown on Plans shall be accurately done. Heating of bar to facilitate bending is not allowed. Lap reinforcing mesh a minimum of one section of mesh.
 2. All reinforcement, at the time concrete is placed, shall be free of mud, oil, mill scale or other materials that may adversely affect or reduce the bond.
 3. Slabs on grade shall have reinforcement supported on solid precast concrete blocks, polyethylene chairs, or other approved means of support that does not puncture vapor barrier.
 4. Structural slabs, beams and girders shall have reinforcement supported on bar supports not exceeding 4'-0" spacings in either direction. Begin spacing 1'-0" from centerline of columns or from supporting walls. Bar supports to be ACI-SP66, Class I or II, for all exposed concrete. Class III is permitted for structural slabs on grade. Bottom reinforcing in all structural slabs to be placed on continuous lines of slab bolsters and top reinforcing to be placed on high chairs and support bars to maintain indicated concrete cover.

5. Dowels shall be secured to hold dowels perpendicular to control joint in both the horizontal and vertical direction.
- B. Convey concrete from the mixer to the place of final deposit by methods which will prevent the separation or loss of the materials. Equipment for placing concrete shall be of such size and design as to insure practically continuous flow of concrete at the delivery and without segregation of the materials.
- C. Concrete shall not be placed by means of open chutes, the combined length of which exceeds 30 feet, and shall not be allowed to drop freely through distances exceeding ten feet (10') for concrete containing a high range water reducing admixture or five feet (5') for other concrete or through closely spaced reinforcing bars, conduits, etc., which will tend to segregate materials.
- D. Deposit concrete as nearly as practicable in its final position to avoid segregation due to re-handling or flowing. No concrete that has partially hardened or been contaminated by foreign material shall be deposited on the work.
- E. Pumped concrete shall have laboratory inspectors on the site at all times.
- F. When concreting is once started, it shall be carried on as a continuous operation until the placing of the panel, section or individual foundation is completed. The top surface shall be generally level. When construction joints are necessary, they shall be made in accordance with the following requirements:
 1. Construction and control joints not shown shall be located as to least impair the strength and appearance of the work. Location of joints to be subject to Architect's approval.
 2. Construction joints in supported slabs shall be located near the point of minimum shear, unless otherwise designated by the Architect.
 3. Special care shall be taken in the preparation of all construction joints.
 4. Except where otherwise specified, prepare the surfaces of construction joints in a manner which will insure bonding with concrete or grout later placed on them. Construction joints shall be cleaned, dampened, and the bonding compound shall be applied. Place new concrete after the bonding compound has dried. On all horizontal construction joints, thoroughly remove mortar on protruding coarse aggregate and surface film from the bonding surface, restore to a clean condition by means of vigorous scrubbing with wire brushes or by air and water jetting prior to final set of concrete. An interval of at least ten hours shall elapse between the time concrete is placed on either side of a construction joint.
- G. Place concrete in layers not over 12 inches deep, and thoroughly consolidate by means of vibrators, hand tamping and spading; during the operation of placing, thoroughly work the concrete around reinforcement, embedded fixtures, pipes, conduits and into the corners of the forms so as to prevent interior voids, honeycomb, blow holes, and the patching of concrete surfaces after the forms are removed. Internal vibrators, with a minimum frequency of 8000 VPM, shall be

used to aid in the consolidation of the concrete. Extreme care shall be used on thin sections and exposed concrete.

- H. The removal of forms shall be carried out in such a manner as to insure the complete safety of the structure. In no case shall shores or supporting members be removed before the concrete is set hard and has sufficient strength to safely carry its own weight and all additional loads upon it or about to be put upon it. Formwork for walls, sides of beams and slabs, and other surfaces not supporting the weight of the concrete may be removed as soon as concrete has hardened sufficiently to resist damage from form removal, insufficient curing, or cold temperature, but in no case sooner than 7 days, unless approved curing methods are used to protect concrete. Formwork for beam, joist, and slab soffits, and other surfaces that support the weight of concrete, shall remain in place until concrete has reached 75 percent of its specified 28-day strength, except that after the concrete has reached its 7-day strength, the form facing material may be removed in sections so that no unsupported span exceeds 1/4 of the design span. Securely reshore each section removed before removal of adjacent sections. Reshoring shall remain in place until concrete has reached its 28-day design strength and until the floor or roof above is capable of carrying its own weight and that of construction loads placed upon it.
- I. Exposed corners of beams, columns and partitions shall be chamfered 1", unless otherwise detailed.
- J. Curing: Keep exposed surfaces of concrete moist and at a temperature above 50°F. for a period of at least seven (7) days after being deposited. In hot weather, take measures to insure that the concrete is not subject to wetting and drying.
1. Concrete slabs shall be cured with curing paper and water or low odor curing compound.
 2. Apply curing/sealer compound to concrete floors left exposed and sealed.
 - a. Spray the product with a low pressure sprayer to the entire surface as soon as the surface is firm enough to walk on.
 - b. Keep the entire surface wet for 30 minutes by brooming excess product onto the dry spots or re-spraying the dry spots immediately.
 - c. As the product begins to dry into the surface and becomes slippery underfoot, lightly sprinkle the surface with water to aid penetration and to bring alkali to the surface.
 - d. As the product again begins to dry into the surface and becomes slippery underfoot, flush the surface with water and squeegee the surface totally dry, removing all excess product and alkali or other impurities brought to the surface.
 3. Apply curing compounds immediately after final finishing operations.
- K. Finish Concrete Surfaces: Immediately upon removal of forms, point form tie holes and other defects flush with surface.
1. Remove fins, and fill honeycombing holes and depressions with 1:2 cement-sand mortar on exposed interior and exterior concrete surfaces. Before patching, thoroughly dampen surrounding concrete and apply the bonding compound, "Euco Weld" by the Euclid Chemical Company, or approved equal. Place the patching mortar after the

- bonding compound has dried. Carefully damp cure these patches.
Cut back protrusions. Color of patches to match existing.
2. Rub exposed concrete with carborundum stone to present an evenly textured surface.
- L. Inserts and Attachments: Build into the concrete: collars, sleeves, or thimbles required for piping and wiring, anchors, sockets or inserts for supporting piping, fixtures or attachments; nailing blocks and strips and bond ties. Inserts supporting mechanical fixture shall be furnished and located by the trade who will use same.
- M. Floor Slabs on Fill: Concrete shall be full thickness of slabs and troweled out, as specified below. Slabs in areas where floor drains occur shall be pitched to drains with a uniform gradual pitch in all directions.
1. Section slabs at column lines and/or under partitions where possible. The panel shall be as nearly square as possible. Saw control joints, 1 inch deep with Sof-Cut Model 270 saw, immediately after final troweling with cutting completed within 2 hours after final pass of trowel. Vacuum saw cut concrete spoils from floor surface immediately behind the saw cutting operations.
 2. At exposed slabs (not covered by floor covering), tool edge of construction joint with 1/8" radius on one side of joint only. After concrete has hardened, saw cut along construction joint for installation of joint sealant.
 3. Apply liquid bond breaker on slab edge at construction joints before new pour.
 4. Install isolation joint full depth of slab edge, between slab and abutting surfaces.
 5. Exterior slabs, steps and ramps to have wood float finish.
 6. Floor drains, grease traps and trench drains shall be boxed out and set at exact elevation after the slab has set for 28 days. Provide 24" box out around drain, trap or trench. All floors with drains shall pitch to drain 1/8" per foot average.
- N. Concrete Floor Finish, (In General): Place, consolidate, strike off and level slab to the proper elevation; thoroughly compact by power floating at least twice, leveling with highway screed between each floating, to a uniform sandy texture after the surface has stiffened sufficiently to permit the operation. Steel trowel, at least twice, to a smooth hard dense surface. Concrete floors receiving thin set ceramic or quarry tile shall have the final steel troweling omitted and a fine broom drawn across surface.
1. All steel troweled surfaces shall be finished to an F₃₀ tolerance. Differences in elevation, between two points, shall not exceed 0.13" in 12", 0.31" in 5' and 0.41" in 10'. In addition, floor surface shall not vary more than + 5/8" from the elevation noted on the drawings anywhere on the floor surfaces.
 2. Cure all slabs with the previously specified curing methods applied immediately after final finishing.
 3. Pitch floors uniformly over entire area to floor drains where they occur.
- O. Pad Foundations for Equipment: Install concrete pad foundations for equipment items.

P. Non-Shrink Grout: Grout steel billet bearing plates, column base plates, equipment bases, and other locations noted in the Structural Drawings with non-shrink grout.

Q. Repair of Defective Areas:

1. With prior approval of the Architect, as to method and procedure, all repairs of defective areas shall conform to ACI 301, Chapter 9, except that bonding compound must be used.
2. Patching mortar may be used in lieu of the bonding compound with prior approval of the Architect, when color match of the adjacent concrete is not required.
3. Structural repairs shall be made with prior approval of the Architect, as to method and procedure, using epoxy adhesive and/or epoxy mortar. Where epoxy injection procedures must be used, and approved low viscosity epoxy made by the manufacturers previously specified shall be used.
4. Leveling of floors for subsequent finishes shall be achieved by use of the specified underlayment material.

R. Concrete Walk: Place concrete, screed and wood float surfaces to a smooth and uniform finish, free of open texturing and exposed aggregate. Avoid working mortar to surface. Concrete for walks shall have a water-cement ratio of .44.

1. Bull float directly behind screed before bleedwater appears.
2. Immediately behind bullfloat, drag broom across surface for a medium broom finish.
3. Groove control joints in concrete to detailed layout. Groover tool shall be Goldblatt Trowel No. 84389 06125 or equal, with 1 inch deep groove and 1/4 inch radius edge. Radius edges of walk with 1/4 inch radius edge tool.
4. Where surfaces abut building and vertical surfaces, provide continuous asphalt expansion joint filler.
5. Provide exposed surface of walks with broom finish.
6. Apply exterior curing compound on finished surfaces immediately after placement. Apply in strict accordance with manufacturer's recommendations.

S. Grouted Curbs: Steel trowel, at least twice, to a smooth hard dense surface free of voids and irregularities.

3.03 TEST

A. Cast-in-place concrete slump and air tests, cylinder samples and cylinder breaks will be performed by a licensed independent testing laboratory employed by Shaw's Supermarkets, Inc. Cylinders shall be properly marked, cured and shipped to an independent testing laboratory.

B. Make four cylinders for each of the following conditions:

1. Each day's placement.
2. Each class of concrete.
3. Each change of supplies or source.
4. For each 100 cu. yds. or fraction thereof.
5. For each 50 cu. yds. or fraction thereof for structural slabs.

- C. Each sample shall be clearly marked with date and number, and sampling data should include: project, exact location of placement, truck plant and number, time truck left plant, strength required, cubic yards, weights and sources of all constituents used; also, time concrete sampled, slump appearance, mark of specimens, weather, air and concrete temperature, and date.
- D. One cylinder will be tested at 7 days, one at 14, and one at 28 days. One cylinder shall be tested at 56 days, if required.
- E. Make slump test for each truckload, or more often, at the request of the Field Representative or Architect following procedure in ASTM C-143. All concrete exceeding specified maximum allowable slump shall be rejected and disposed of off the site at no additional cost to the Owner.
- F. Make air tests, in accordance with ASTM C-173 or ASTM C-231, each time slump tests are made of air-entrained concrete, or as directed by the Architect.
- G. The strength level of the concrete will be considered satisfactory so long as the averages of all sets of three consecutive strength test results equal or exceed the specified strength, f_c' and no individual strength test result falls below the specified strength f_c' by more than 500 psi.

END OF SECTION

SECTION 04200

UNIT MASONRY

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Furnish and install all masonry work.
- B. Brick and block cavity walls.
- C. Concrete block walls and partitions.
- D. Masonry veneer.
- E. Cutting and patching.

1.02 REFERENCES

- A. Brick Institute of America (BIA) Technical Notes.
- B. Building Code Requirements for Masonry Structures (ACI 530-88/ASCE 5-88 and Specifications for Masonry Structures (ACI 530.1-88/ASCE 6-88).
- C. ASTM A 82-85 Steel Wire, Plain, for Concrete Reinforcement.
- D. ASTM A 153-82 Zinc Coating (Hot-Dip) on Iron and Steel.
- E. ASTM A 615 81a Deformed and Plain Billet Steel Bars for Concrete Reinforcement.
- F. ASTM C 33-86 Concrete Aggregates.
- G. ASTM C 55-85 Concrete Building Brick.
- H. ASTM C 90- Hollow Load-Bearing Concrete Masonry Units.
- I. ASTM C 91-83a Masonry Cement.
- J. ASTM C 145-85 Solid Load-Bearing Concrete Masonry Units.
- K. ASTM C 150-85a Portland Cement.
- L. ASTM C 207-79 (RE 1984) Hydrate Lime for Masonry Purposes.
- M. ASTM C 216-85a Facing Brick (Solid Masonry Units Made From Clay or Shale).
- N. ASTM C 476-83 Grout for Masonry.
- O. ASTM D 1227-82 Emulsified Asphalt Used as a Protective Coating for Roofing.

1.03 SUBMITTALS

- A. Submittals shall be in accordance with Section 01300.
- B. Submit two samples of each type of masonry unit for approval at least 14 calendar days before beginning.
- C. Submit Shop Drawings for fabrication, bending and placement of reinforcing bars showing all reinforced walls in elevation with bar sizes and locations. Show details of positioning device used to hold the vertical reinforcing parts in the proper position within the cells.
- D. The Owner will test block to verify they meet the specified requirements including net area compressive strength, linear shrinkage, Type I, and Grade N criteria. Test results and certification shall be based upon test of the block to be used on the project.
- E. Submit mortar mix design and ASTM C109 Compressive Strength test results.
- F. Submit grout mix design and ASTM C1019 sampling and strength test results.
- G. 3 prism tests will be conducted by Shaw's testing agency before starting walls to determine compressive strength of masonry in accordance with ASTM E447 Method B modified as follows:
 - 1. Prisms shall be constructed in stack bond, one unit long and thick with a full mortar bed.
 - 2. Concrete masonry prisms shall have a height to thickness ratio in the range from 1.33 to 5.0.
 - 3. For hollow masonry units, the minimum number of joints shall be 1.
- H. At least 7 calendar days before starting masonry, provide 4' x 4' mock-up panels of storefront construction for Shaw's review and approval. Provide additional panels when required to show details of architecture.

1.04 DELIVERY, STORAGE AND HANDLING

- A. Handle masonry units in such a manner as to prevent chipping and breakage. Locate storage piles, stacks, or bins to avoid or be protected from heavy or unnecessary traffic.
- B. Deliver cementitious materials to site in manufacturer's standard packages. Immediately upon delivery to site, store in waterproof sheds, or upon raised platforms, and effectively protect by tarpaulin covers or other approved means, until use. No cementitious or other material that has become caked or hardened shall be permitted in the work.

1.05 ENVIRONMENTAL REQUIREMENTS

- A. Fully protect masonry units delivered in freezing weather by a weathertight covering such as tarpaulin, Sisalkraft paper or other weatherproof materials to prevent the accumulation of ice on the brick

or block. Loose board covering shall not be approved. Heat sand in such a manner as to remove frost, ice and excess moisture. The equipment and method used for heating sand shall be such as will prevent burning or scorching the sand. Water shall be heated to a temperature of approximately 180°F. When necessary to remove frost or excess moisture, heat bricks to a temperature of about 180°F. After mortar has been mixed, maintain at a temperature of not less than 70°F nor more than 100°F until it has been placed in the masonry. Protect work and above precautions whenever the temperature is 45°F, and falling. When temperature is 40°F, and rising, above methods not necessary, except as directed. Protect finished work against freezing for at least 48 hours. The use of salt or other chemicals intended to lower the freezing point of mortar shall not be permitted.

- B. Before proceeding with masonry work, consult with the Architect and obtain his approval of the methods that are to be followed.

1.06 FIELD TESTING

- A. The Owner will hire an independent testing company to do periodic testing of materials delivered to the site. Grout mortar and block will be selected at random, and tested at a frequency of not less than one for every 5,000 S.F of wall during construction. Test result will be delivered directly to Shaw's.
 - 1. Material failing test shall be re-tested for compliance, with costs for re-testing paid by the Contractor.
 - 2. Non-complying material shall be removed from the work and the job site.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Masonry Reinforcing: A. A. Wire Products Company, Hohmann and Barnard, or Dur-O-Wall.
- B. Lime: Lee Lime Company "Minute Man," or Warner Company "Super Limoid."
- C. Cement: Dragon or Independent Cement.
- D. Asphalt Mastic: A. C. Horn, Sonneborn, or approved equal. Asbestos free.
- E. Fabric Flashing: Wasco, Sandell or Afco.
- F. Wall Flashing (Elastomeric): W. R. Grace.
- G. Wall Ties: Hohmann and Barnard.
- H. Control Joint Keys: Williams Products Inc. "Everlastic."
- I. Water-Repellent Admixture: W.R. Grace Dry-Block Mortar Admixture

2.02 MASONRY

- A. Face Brick: New brick meeting requirements of ASTM C-216, latest edition, Grade SW. IRA less than 20, 8,000 psi minimum compressive strength; Glen-Gery Amherst.
- B. Concrete Block: Load-bearing sand and gravel concrete units meeting requirements of ASTM C90 and C145, latest edition, normal weight, Type 1, Grade N with the exception that exposed block shall be free from cracks, splits, spalls, chips and other defects. Nominal face size shall be 16 inches by 8 inches. Special blocks shall be used for corners, jambs, closures, etc. Outside corners shall be square.
 - 1. Insulated block shall meet the requirements above and be Korfil, Uni-Therm or Blockfil insulated with expanded polystyrene standard core filler. U-value for insulated 8" block shall be .19 maximum and .16 maximum for 12" block. The net area compressive strength of the block shall be 1900 psi or greater.
 - a. The net area compressive strength of masonry, using Type S mortar shall be 1500 psi or greater.

2.03 MORTAR MATERIALS

- A. Sand: Sand used throughout the work shall be well-screened, clean, hard, sharp, siliceous, free from loam, silt or other impurities and graded so that 100% will pass through No. 8 mesh sieve, and from 15% to 35% through No. 50 sieve, conforming to the requirements of ASTM C-144, latest edition.
- B. Water shall be potable.
- C. Cement: Portland cement of domestic manufacture, conforming to the requirements of ASTM C-150, Type I or Type II. Only one brand of cement shall be used throughout the project. Blue Circle Portland cement and lime is acceptable. Standard masonry cements are not acceptable.
- D. Lime: Type S hydrated lime, ASTM C207.
- E. Coloring for Precast Concrete Mortar: Pigment for masonry cement packaged in premeasured amounts. Color to match precast concrete.

2.04 REINFORCEMENT AND ANCHORAGE

- A. Interior Block Walls: Continuous ladder type, 9 gauge mill galvanized.
- B. Exterior Block Wall: Continuous ladder type with 3/16" side rods and No. 9 gauge truss rod, galvanized ASTM A153, Class B-2, 1.50 ounce zinc coating.
- C. Cavity Walls:
 - 1. Block Back-Up: Continuous ladder type with 3/16" side rods and No. 9 gauge cross rod.
 - 2. Face Veneer: Rectangular adjustable type wall ties, manufactured from 3/16" diameter, high tensile, cold-drawn steel conforming to material requirements of ASTM A82.

3. All cavity wall reinforcing shall be galvanized in accordance with ASTM A153, Class B-2, 1.50 ounce zinc coating.
- D. Wall Ties for Veneer on Stud Wall: Dur-O-Wall D/A 213; hot dip galvanized after fabrication: 3/16" wire; cavity drip; anchor plate; D/A 807 fastener with Climaseal finish, two per tie.
- E. Steel Reinforcement: Deformed bars complying with ASTM A-615, Grade 60, and of domestic manufacture.
- F. Column Anchors: Rigid Anchors, 2" x 1/4" F.B.

2.05 MISCELLANEOUS ACCESSORIES

- A. Asphalt Mastic: Trowel type fabricated mastic, meeting requirements of ASTM D-1227, Type 1, "Dehydratine" 95 by A. C. Horn, Sonneborn's "Hydrocide 700," or approved equal. Material shall be asbestos-free.
- B. Compressible Material: Expanded polystyrene, one pound per cubic foot density.
- C. Control Joint Keys: Solid extruded neoprene slot seal with 5/8 inch thick shear section and 3/8" inch thick flanges.
- D. Weep Holes: Dur-O-Wall cell vent weep hole ventilator.
- E. Flashings for Masonry:
 1. Metal Flashing: 16 oz. lead-coated copper. Prefabricate to detail using metal break; keep exposed edges uniform and straight. Roofing counter-flashing and receiver counter-flashing specified in Section 07600.
 2. Fabric Flashing: 7 oz. fiberglass backed copper.
 3. Wall Flashing (Elastomeric): W. R. Grace Perm-A-Barrier system.
 - a. Flashing: 32 mil thick rubberized asphalt compound laminated to 8 mil thick cross laminated polyethylene film.
 - b. Surface Conditioner: Latex based, water dispersed liquid surface prep.
 - c. Termination Mastic: Bituthene mastic.

2.06 MORTAR MIX

- A. Mortar Type S for concrete block and brick.
- B. Admixtures will not be allowed.

2.07 CONCRETE

- A. Concrete for Bond Beams and Lintels: 3000 psi concrete meeting requirements specified in section Cast-In-Place Concrete.

2.08 GROUT

- A. Grout Mixture: ASTM C476, grout for reinforced masonry, 3000 psi, 28-day strength, maximum slump 9"± 1"; fine or coarse aggregate grout as required by the grout space.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Measure mortar materials in boxes, or other approved units. Use machine batch mixer, except that where small quantities are required, mixing may be done by hand. Mixer shall be subject to approval of the Architect. Time of mixing shall be not less than 5 minutes after all materials are in the mixer. Mix only enough mortar at one time to supply immediate requirements.
- B. Use mortar within two hours of mixing.
- C. If necessary, re-temper mortar within two hours of mixing to replace water lost by evaporation.

3.02 INSTALLATION

- A. Laying and Setting Masonry Work:
 - 1. Build, move and maintain scaffolding required for installation of masonry work.
 - 2. Build walls uniformly, one scaffolding high at a time, plumb, true to lines, with horizontal joints level. Cover the top of walls when work is discontinued with waterproof covering. Build in sleeves, anchors, chases, bucks, cleanouts, access doors, lintels, sills and other items as indicated.
 - 3. Cut masonry units with masonry saw.
 - 4. Lay masonry in full beds of mortar. Head joints shall be full.
 - 5. Head joints shall be centered on masonry unit below.
 - 6. Tothing masonry work shall not be allowed. Where it is necessary to terminate masonry at a point other than a jamb line, rack the work from the lower level to the top of wall.
 - 7. Cavity Walls:
 - a. Lay-up block backup ahead of face brick.
 - b. Trowel the cavity side of block backup with a 3/16" thick coat of asphalt mastic, covering completely.
 - c. Follow immediately with cavity insulation, where indicated, pushed into the mastic.
 - d. Lay-up facebrick, exercising care to keep void clear of mortar.
 - e. Install continuous reinforcing in every second block course with adjustable ties placed in alternate block courses 16" o.c. horizontally for brick.
 - 8. Masonry Veneer:
 - a. Anchor with reinforcing ties spaced 16" o.c. horizontally and 16" o.c. vertically. Secure ties with screws through sheathing to studs.
 - b. Provide continuous horizontal-joint reinforcement in block veneer. Space reinforcement not more than 16 inches (406 mm) o.c., starting reinforcement on top of the first block veneer course.
 - 9. Lay concrete block in running bond. Form concave mortar joints for block. Form concave mortar joints for scored block, grouting scores concave to match. Install at least three courses of brick as bearing for steel. Wipe block that will be exposed with burlap. No chipped block shall be laid exposed.

10. Reinforce concrete block walls every second course with reinforcement of appropriate size.
11. All CMU cross webs for the first 3 courses above the flashings shall be fully bedded with mortar.
12. Lay brick in running bond. Form concave mortar joints.
13. Wall Flashing: Install wall flashing (elastomeric), at the base of walls and over window and door heads and other openings in masonry, stepped up over lintels. Ends of flashing shall extend 6" beyond openings and shall be turned up to form pan draining to exterior of building. Flashing to provide 7" vertical lap. Lap joints at least 3 inches and seal contacting surfaces. Prime surfaces as required by wall flashing manufacturer. Seal laps, top edges, seams, cuts and penetrations with bituthane mastic. Do not expose Perma-barrier material.
 - a. Set receiver in masonry for roof flashing. Install back-up plates covered with mastic behind joints. Counterflash receiver with fabric flashing.
14. Provide 2" vertical end joint weep holes at the bottom of masonry faced exterior walls, over lintels, and flashing. Weep holes shall be approximately 2'-8" o.c. Provide at least two weep holes between each grouted masonry pier.
15. Provide control joints as indicated.
16. Bed anchors of hollow metal frames in mortar joints. Fill frame voids solid with mortar. Fill masonry cores with mortar minimum 12 inches from framed openings.
17. Cooperate in setting window and door frames, and set all flashing, dowels, ties, clips, anchors, and wood bricks, and miscellaneous items that occur in masonry walls. Set plates level in full beds of mortar and all steel framing, anchors, and other work finished under other Divisions shall be set and built in as masonry work progresses.
18. Bond walls and partitions in each course at corners and intersections.
19. At points where straight joints (SJ) are indicated, provide corrugated ties every other course.
20. Build partitions enclosing pipe or duct spaces after mechanical work has been installed and tested.
21. Form suitable recesses, as required, for cabinets and other equipment of the Mechanical and Electrical trades. Install electrical risers and outlet boxes before partitions are built.
22. Column Anchors:
 - a. Rigid Anchors: Install in locations as shown on the drawings.
 - b. Flexible Anchors: Install in all other locations at 2'-0" o.c., unless otherwise noted.
23. Cutting and Patching: Consult other trades in advance to make provisions for installations of their work to avoid cutting and patching. Cutting or patching required to accommodate work of others shall be done by mechanics performing the work under this heading.

3.03 GROUTED MASONRY

- A. Provide cleanout holes at bottom of masonry walls to facilitate cleaning of cores prior to placing concrete grout.

- B. Accurately position reinforcing steel and rigidly secure against displacement.
- C. Clean concrete grout spaces of excess mortar and debris. Use method acceptable to Architect.
- D. After observation of concrete grout spaces, by Architect, plug clean-out holes with masonry units. Brace against concrete grout pressure.
- E. Work concrete grout into cores and vibrate wall to eliminate voids.
- F. Do not displace reinforcing steel while placing concrete grout.
- G. Do not insert insulated core filler at reinforced cores.

3.04 CONSTRUCTION TOLERANCES

- A. Variation from Plumb: For vertical lines and surfaces of columns, walls and arises do not exceed 1/4" in 10' or, 3/8" in a story height not to exceed 20', nor 1/2" in 40' or more. For external corners, expansion joints, control joints and other conspicuous lines, do not exceed 1/4" in any story of 20' maximum, nor 1/2" in 40' or more. For vertical alignment of head joints do not exceed plus or minus 1/4" in 10', 1/2" maximum.
- B. Variation from Level: For bed joints and lines of exposed lintels, sills, parapets, horizontal grooves and other conspicuous lines, do not exceed 1/4" in any bay or 20' maximum, nor 1/2" in 40' or more. For top surface of bearing walls do not exceed 1/8" between adjacent floor elements in 10' or 1/16" within width of a single unit.
- C. Variation of Linear Building Line: For position shown in plan and related portion of columns, walls and partitions, do not exceed 1/2" in any bay or 20' maximum, nor 3/4" in 40' or more.
- D. Variation in Cross-Sectional Dimensions: For columns and thickness of walls, from dimensions shown, do not exceed minus 1/4" nor plus 1/2".
- E. Variation in Mortar Joint Thickness: Do not exceed bed joint thickness indicated by more than plus or minus 1/8", with a maximum thickness limited to 1/2". Do not exceed head joint thickness indicated by more than plus or minus 1/8".
- F. Variation in Adjacent Masonry Units: Do not exceed 1/32 inch variation from masonry unit to adjacent masonry unit.

END OF SECTION

STRUCTURAL STEEL

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. All labor, materials and equipment necessary for the design, fabrication, delivery and erection of all structural steel including anchor bolts, plates and structural framing accessories.
- B. Anchor bolts, bearing plates, lintels and angles to be embedded into masonry or concrete shall be furnished but not installed under this section.

1.02 RELATED SECTIONS

- A. Section 03300: Cast-In-Place Concrete.
- B. Section 04200: Unit Masonry.
- C. Section 05210: Steel Joists and Joist Girders.
- D. Section 05310: Steel Roof Deck.
- E. Section 05311: Steel Form Deck and Composite Steel Floor Deck.

1.03 REFERENCES

- A. Manual of Steel Construction Allowable Stress Design, AISC, 9th Edition.
 - 1. AISC Specification for Structural Steel Buildings - Allowable Stress Design and Plastic Design.
 - 2. AISC Code of Standard Practice.
 - 3. Specification for Structural Joints Using ASTM A325 or A490 Bolts, Research Council on Structural Connections.
- B. AWS D1.1-88 "Structural Welding Code - Steel," American Welding Society.
- C. "Systems and Specifications: Steel Structures Painting Manual," Volume 2; Steel Structures Painting Council (SSPC); 1982.
- D. "BOCA National Building Code 1999," Building Officials and Code Administrators International, Inc.
- E. ASTM A36-88: Structural Steel.
- F. ASTM A325-88: High-Strength Bolts for Structural Steel Joints.
- G. ASTM A449-93: Specification for Quenched and Tempered Steel Bolts and Studs.
- H. ASTM A500-84: Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
- I. ASTM A 6/A 6M-88: General Requirements for Rolled Steel Plates, Shapes, Sheet Piling and Bars for Structural Use.
- J. ASTM A307-88a: Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.

- K. ASTM A563-89: Carbon and Alloy Steel Nuts.
- L. ASTM F436-86: Hardened Steel Washers.
- M. ASTM A53-88: Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
- N. ASTM A501-88: Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.
- O. ASTM A618-84: Hot-Formed Welded and Seamless High Strength Low-Alloy Structural Tubing.
- P. ASTM A108-89: Steel Bars, Carbon, Cold Finished, Standard Quality.
- Q. ASTM A123-89: Zinc (Hot-Dip Galvanized) Coating on Iron and Steel Products.
- R. ASTM A490-88: Heat-Treated Steel Structural Bolts, 150 ksi, Minimum Tensile Strength.
- S. ASTM A572/A 572M-88c: High-Strength Low-Alloy Columbium-Vanadium Steels of Structural Quality.
- T. ASTM A588/A 588M-88a: High-Strength Low Alloy Structural Steel with 50 ksi [345 MPa] Minimum Yield Point to 4 in. [100 mm] thick.

1.04 SYSTEM DESCRIPTION

- A. General: Unless otherwise specifically approved in writing, furnish exact sections, weights, and kinds of material specified, using details and dimensions shown and furnish design calculations for all structural steel connections.
 - 1. Not all connections are detailed; similar details apply to similar conditions, unless otherwise indicated. Contact the Architect promptly to verify design of members or connections in any situation where design requirements are unclear.

1.05 SUBMITTALS

- A. Shop Drawings will not be reviewed until the following items have been submitted for Architect's records.
 - 1. Certification of membership in AISC or Structural Steel Fabricators of New England (SSFNE).
 - 2. Description of Quality Control Program for shop fabrication which insures all work shall be done in accordance with this specification and referenced standards.
- B. Submit Certificates of Compliance as evidence of conformity with ASTM and AWS Standards specified for Architect's records.
 - 1. Provide certified laboratory or mill reports in accordance with ASTM A6 for structural steel.
 - 2. Provide manufacturer's Certificate of Compliance for high strength connection bolts, nuts and washers.
 - 3. Provide manufacturer's Certificate of Compliance for weld filler materials.
- C. Product Data: Submit manufacturer's data for products as follows, including sufficient data to show compliance with specified requirements:
 - 1. Test reports and manufacturer's installation instructions for Load Indicating bolts to be used in shop and field.

2. Specifications for primer paint, including manufacturer's data on chemical composition, and dry film thickness per applied coat.
 3. Specifications for faying surface coating and certified test report.
 4. Manufacturer's data, installation instructions, and load tables for expansion anchor bolts and chemical anchor bolts.
- D. Shop Drawings: Submit complete Shop Drawings including detail drawings and erection drawings for structural steel. Include information on location, type, and size of bolts and welds, distinguishing between those made in the shop and those made in the field.
1. Indicate weld lengths and sizes, using standard AWS welding symbols.
 2. Include setting drawings and templates for anchorages to be installed as work of other sections.
 3. Indicate tightening procedure for shop and field installed bolts.
 4. Detail drawings shall indicate steel members and parts of steel members which are to receive no paint, faying surface coating, or galvanizing, as applicable.
 5. Detail drawings shall show complete details and schedules for fabrication and shop assembly of members including profiles, sizes, steel yield strengths, spacing, location, connections, fasteners and cambers.
 6. Beam and column mark numbers shall be cross referenced to the corresponding erection plan and to the column grid location.
 7. Detail drawings shall show the name of the shop paint and dry film thickness to be used.
- E. Submit design calculations for all structural steel connections simultaneously with Shop Drawing submittal. Connection design shall reference and follow Tables IA through IG and II through XXVI of AISC Manual of Steel Construction.
1. Beam reactions shall be calculated based on one half the value from the tables "Allowable Uniform Load Capacity for Beams Laterally Supported" or the reaction indicated on Contract Drawings.
 2. Connection design shall be cross referenced to actual piece marks.
 3. Coped beams shall be designed in accordance with AISC publication "Engineering for Steel Construction," Appendix B.
 4. The connection design shall show all applicable checks for the type of connection, including but not limited to:
 - a. Bolt shear and bolt bearing on the web and connecting pieces, including consideration for eccentric loads.
 - b. Web shear, block shear, web bending and web buckling.
 - c. Shear and bending on the connecting piece (angle or plate).
 - d. Weld shear and bending stresses including consideration for eccentric loads.
 - e. Tension on bolt and connecting pieces.
 5. The above list is not intended to preclude any particular connection design or fabrication technique, provided said design follows AISC and AWS Standards.
 6. Connection design shall be stamped by a Professional Engineer registered in the state where the project is located.
- F. The testing and inspection agency will submit test reports directly to the Architect, for all tests of connections and

reports of inspection.

G. Submit welders qualifications before any shop or field work is started.

1. Submit a list of embossing marks to identify each welder.

H. Submit Shop Drawings and calculations in accordance with Section 01300.

1.06 QUALITY ASSURANCE

A. Welding Procedures: Establish that joint welding procedures are prequalified or test in accordance with AWS qualification procedures.

B. Welder Qualifications: Welders must be currently certified under American Welding Society qualification procedures. Welders shall emboss each piece of work that they produce with a mark that identifies them.

C. Testing and Inspection Agency: The Owner will hire an independent testing and inspection agency for shop and field inspection. The independent inspector shall perform testing, inspect and evaluate connections, prepare test reports and verify conformance to this specification and referenced standards.

1. Only AWS Certified Welding Inspectors shall inspect and evaluate welds.

2. Correct deficiencies in the structural steel work identified by the testing and inspection agency at no additional expense to the Owner. Subsequent tests to confirm the adequacy of corrected work will be at the Contractor's expense.

PART 2 - PRODUCTS

2.01 MATERIALS AND COMPONENTS

A. Structural Steel Shapes: Shall conform to requirements of ASTM A572-GR.50.

B. Angles, Rods, Plates and Bars: ASTM A36.

C. Anchor Bolts: ASTM A307, non-headed, Grade A, with cut threads and heavy hex nuts. Provide ASTM A449, Fy=105 ksi, where high strength anchor bolts are indicated.

D. High-Strength Bolts, Nuts and Washers: ASTM A325, Type 1, with matching ASTM A563 nuts and ASTM F436 washers; except provide Type 1 galvanized bolts, nuts and washers for galvanized steel members.

E. Welding Materials: E70 or Type required for materials being welded and conforming to applicable A.W.S. Specifications.

F. Load Indicating Bolts: Provide snap off high-strength bolts that shall be certified to provide the minimum fastener tension per AISC "Specification for Structural Joints Using ASTM A325 or A490 Bolts."

G. Primer Paint: Shop prime all structural steel, except steel encased in concrete or otherwise called for. Primer shall be Gray "Combatit" Metal Primer as manufactured by Wilbur & Williams Company, or "10-1009 Gray Metal Primer" as manufactured by Tnemec.

- H. Pipe Columns: Shall meet the requirements of ASTM A-53, standard weight, ASTM A-501, extra-strong, or ASTM A-618, double extra strong, seamless, Grade B.
- I. Tube Columns: Square or rectangular structural tubing columns shall meet the requirements of ASTM A-500, Grade B, FY = 46KSI.
- J. Expansion Bolts and Chemical Bolts:
 - 1. In Concrete: Hilti Kwik Bolt II, or approved equal,
(Unless noted otherwise on contract drawings.)
 - 2. In Solid Block: Hilti sleeve anchor, or approved equal.
 - 3. In Solid Brick or as Noted: Hilti Hit Renovation anchor.
- K. High-Strength, Low-Alloy Columbium-Vanadium Steels: ASTM A572.
- L. Steel Stud Shear Connectors: ASTM A108 cold-drawn bar stock and complying with requirements of ANSI/AWS D1.1.
- M. High-Strength Structural Bolts: ASTM A490, Type 1, with matching ASTM A563 nuts and ASTM F436 washers.
- N. Faying Surface Coatings: Paint used on the faying surfaces of bolted friction connections, shall be qualified by test in accordance with "Test Methods to Determine the Slip Coefficient for Coatings Used in Bolted Joints" as adopted by the Research Council on Structural Connections. Manufacturer's certification shall include a certified copy of the test report.

2.02 FABRICATION

- A. Coordination With Testing and Inspection Agency:
 - 1. Fabricator shall submit fabrication schedule to Contractor at least 3 working days prior to beginning work.
 - 2. Connections shall not receive primer until inspection is completed.
 - 3. Fabricator shall provide access for testing and inspection agency so that specified testing and inspection can be completely and safely accomplished.
- B. Shop Assembly - General: Comply with requirements of AISC Specifications. Shop fabricate and assemble to greatest extent possible.
- C. Connections:
 - 1. Bolts: High-strength steel bolts, except as otherwise indicated:
 - a. Bolting: Comply with requirements of AISC "Specification for Structural Joints Using ASTM A325 or A490 Bolts" and this Specification.
 - 2. Welds: Comply with requirements of AWS Code for procedures, appearances and quality of welds.
 - 3. Shop and field connections shall be fully tensioned bearing type "X" or welded, unless noted otherwise.
 - 4. Bolted moment connections shall be slip critical type and shall meet requirements set forth by referenced standards.
 - a. Slotted holes are not allowed.
 - 5. Holes in Steel Members: Make all holes by means of cutting, drilling, or punching at right angles to surface of metal. Do not make or enlarge holes by burning.
- D. Shear Connectors: Automatic end welding shall be in accordance with the AWS Code and manufacturer's printed instructions.

1. Fillet Welding: At Contractor's option, shear connectors to be fillet welded, following procedure specified in the AWS Code.

E. Shop Coating - Galvanizing:

1. Preparation: Thoroughly clean members to be galvanized, removing loose rust and mill scale.
2. Galvanizing: Perform galvanizing in accordance with requirements of ASTM A123 G60.
3. Galvanized faying surfaces for slip critical bolted connections shall be roughened by means of hand wire brushing. Power wire brushing is not allowed.

2.03 SHOP COATING - PAINT

A. General: Shop paint structural steel, except those members or portions of members which will be embedded in concrete or masonry.

1. Do not paint the following surfaces:
 - a. Surfaces adjacent to field welds.
 - b. Other surfaces when specifically noted on drawings or schedules.

B. Preparation: Thoroughly clean steel surfaces to be shop primed, removing loose rust, loose mill scale, dirt, oil, and grease. Clean steel in accordance with SSPC-SP3: Power Tool Cleaning.

C. Painting: Apply specified primer paint at a rate sufficient to provide a finished thickness of not less than 1.5 mils and an average thickness of 2.0 mils.

2.04 SHOP QUALITY CONTROL

A. Testing and Inspection:

1. Verify that material identification markings (steel, bolts, and weld filler materials) match manufacturer's certificate of compliance submitted to the Architect.
2. Verify AWS certification of welders. Verify embossing practice.
3. Provide visual inspection of welds and bolted connections after fabrication.
4. Review fabrication procedures for general conformance with this Specification and Referenced Standards.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Temporary Support: Provide temporary guys, braces, falsework, cribbing, or other elements required to secure the steel framing against loads equal in intensity to design loads. Remove such temporary support only when permanent connections have been made and the steel framing is fully capable of supporting design loads, including any temporary construction loads.

3.02 ERECTION

- A. General: Erect structural steel in compliance with AISC Code of Standard Practice.
- B. Assembly: Set structural members accurately to locations and elevations indicated.

- C. Columns and Bearing Surfaces:
 - 1. Clean bearing and contact surfaces before assembly.
 - 2. Set base plates accurately, using 1/4" thick leveling plates.
- D. Welding:
 - 1. Do not perform field welding when ambient temperature is at 0 degrees F. or below, or when surfaces are wet, exposed to rain, snow, or high wind.
 - 2. Perform field welding in accordance with AWS Code.
 - 3. Remove erection bolts used in field-welded construction.
- E. Touch-Up Painting: Immediately after inspection of structural steel, clean painted areas which have been abraded or otherwise damaged by welding or other field operations. Use touch-up paint not matching shop paint.
- F. Shear stud connectors shall be welded in strict accordance with manufacturer's instructions. Studs, deck material, and structural steel shall be clean and dry. Do not weld through more than one layer of steel deck.

3.03 FIELD QUALITY CONTROL

- A. Testing and Inspection:
 - 1. General: Provide access to testing and inspection agency so that specified testing and inspection can be safely accomplished.
 - 2. Field-Bolted Connections: Comply with testing and verification procedures in AISC "Specification for Structural Joints using ASTM A325 or A490 Bolts."
 - 3. Field-Welded Connections: Inspect all field-fabricated welds and verify certification and embossing of welders.
 - 4. Review erection procedures for general conformance to this Specification and Referenced Standards.
- B. Shear Stud Inspection and Testing: Visually inspect weld fillets. A fillet of less than 360° is cause for further inspection. Such studs shall be hammer tested, bending the stud 15° from the vertical toward the closest end of the embedment plate or steel member. One stud in each 100 shall be tested by bending 15° from vertical. One stud in each 200 shall be tested by bending 30° from vertical. Bending without failure indicates a satisfactory weld. Single bent studs may be left bent. When failure occurs additional testing of 10 studs on each side of failed stud shall be done. Bend studs 30° from vertical. If failure occurs from additional testing, repeat testing of ten studs on each side of failed stud until there are no failures. If no failure occurs from additional testing, straighten all bent studs, and continue regular testing. Replace all studs that fail.

END OF SECTION

STEEL JOISTS AND JOIST GIRDERS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Furnish labor, materials and equipment necessary for the design, fabrication and installation of steel joists and joist girders and accessories.

1.02 RELATED SECTIONS

- A. Section 03300: Cast-In-Place Concrete.
- B. Section 04200: Unit Masonry.
- C. Section 05120: Structural Steel.
- D. Section 05310: Steel Roof Deck.
- E. Section 05311: Steel Form Deck and Composite Steel Floor Deck.
- F. Section 05500: Metal Fabrications.

1.03 REFERENCES

- A. SJI-88: "Standard Specifications Load Tables and Weight Tables for Steel Joists and Joist Girders," Steel Joist Institute.
- B. AWS D1.1-88: "Structural Welding Code - Steel," American Welding Society.

1.04 SUBMITTALS

- A. Submittals shall be in accordance with Section 01300.
- B. Furnish certification that the joists as furnished meet the "Standard Specifications Load Tables and Weight Tables for Steel Joists and Joist Girders," published by the Steel Joist Institute, latest edition, and are a product approved by the Steel Joist Institute.
- C. Submit detailed Shop Drawings showing layout of joist units, bearing conditions, panel point spacings, special connections, extended ends, and accessories. Include the mark, number, type, location and spacing of joists and bridging. Indicate that joists have been designed for uplift loading and other special load conditions required on the contract drawings.
- D. For Architect's records, submit Shop Drawing with Professional Engineer's stamp for design of joists designated with "SP" on contract drawings, including but not limited to, joists subject to non-uniform loadings and concentrated loadings.
- E. Submit written notification to the Engineer should special joist design require additional bridging not shown on the contract plans.
- F. Submit field repair drawings with Professional Engineer's stamp for Architect's records.
- G. Submit corrected set of final Shop Drawings for Architect's records.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Steel Joists: Shall be type K-Series and LH-series joists, as manufactured by an acceptable manufacturer whose operations and welding methods have been approved and certified by the Steel Joist Institute, and are regularly inspected by the Institute.
- B. Shop Primer: Standard metal-protective paint used by manufacturer of the joists.
- C. Bridging: ASTM A36, size as noted on the contract drawings.
- D. Headers: Manufacturer's standard, designed for the loads indicated on the contract drawings.

2.02 DESIGN AND FABRICATION

- A. Design, detail and fabricate steel joists and joist girders and accessories in accordance with SJI Standard Specifications.
 - 1. The joist manufacturer shall design and detail the steel joists and joist girders for non-standard conditions indicated including, but not limited to: depth of bearings, sloped and skewed bearing seats, extended ends, top chord pitch greater than 1/8" per foot, joist girder varying panel point distances and varying panel point loads, and uniform load, non-uniform load, and concentrated loads on joist and joist girder top chord.
 - 2. Deflection of joists and joist girders shall be limited to span in inches divided by 240, under total load.
 - 3. Provide standard camber in joist and joist girders unless noted otherwise. Certain joists specified on the contract drawings shall be fabricated without the standard camber.
 - 4. Provide S or R type joist extended end as required for uniform load indicated on SJI load tables of the span of the joist, or for special loads indicated on the contract plans.
- B. Provide bridging, headers, and clips for a complete installation.
- C. Shop prime with one coat of primer in accordance with SJI-88.
- D. Drill holes in top chords where necessary for attachment of wood nailers.

PART 3 - EXECUTION

3.01 ERECTION

- A. Set joists true, and so secure as to remain during placing of deck.
- B. Unless specified otherwise, work shall be erected in strict accordance with the SJI Standard Specifications.
- C. Handle joists with care. At all times, joist shall be supported at two or more points and shall be protected from dampness.
- D. Do not use damaged joists.
- E. Space joists accurately. Spacing shall not exceed maximum spacing indicated.

- F. Fasten joists in place and install permanent bridging before any construction load, except the weight of the necessary workmen to install bridging, is placed upon joists.
 - G. Check joist locations for interference with mechanical trades before erection. Locate joists to accommodate openings, pipes, equipment ducts, conduits and other utility items.
 - H. Welding shall be in accordance with AWS D1.1 by a welder licensed for the type of weld they will be performing.
 - I. Positive anchorage shall be provided at the ends of each bridging row at both top and bottom chords.
 - J. Field modifications or repair shall not be made to joist and joist girders without written approval from the Architect.
 - K. Coordinate proper placement of anchorages in masonry construction as required for joist bearing, bridging termination, and extended bottom chords.
 - L. Locate uplift bridging on joist bottom chord, at first panel point from support.
- 3.02 PAINTING
- A. Spot prime field bolts, welds and abrasions to shop coat with same primer used in shop.

END OF SECTION

STEEL ROOF DECK

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Furnish labor, materials and equipment necessary for the fabrication and installation of steel roof deck and accessories.

1.02 RELATED SECTIONS

- A. Section 05120: Structural Steel.
- B. Section 05210: Steel Joists and Joist Girders.
- C. Section 05500: Metal Fabrications.

1.03 REFERENCES

- A. Steel Deck Institute (SDI) "Design Manual for Composite Decks, Form Decks and Roof Decks," 1989.
- B. American Iron and Steel Institute (AISI) "Specification for the Design of Cold-Formed Steel Structural Members," latest edition.
- C. AWS D1.1-88: "Structural Welding Code - Steel," American Welding Society.

1.04 SUBMITTALS

- A. Submittals shall be in accordance with Section 01300.
- B. Submit Shop Drawings showing layout of deck panels, deck profile dimensions, anchorage to supports, projections, openings and reinforcement, finishes, end details, and accessories. Submit catalog showing deck properties and load tables. Show manufacturer's deck designation on Shop Drawings.
- C. Submit verification that deck design and manufacture is in compliance with the Steel Deck Institute Specifications.
- D. Submit manufacturer's data for mechanical fasteners to be used for anchorage of deck to supports and at sidelap connections.

1.05 PRODUCT HANDLING

- A. Handle in accordance with manufacturer's requirements. Steel deck shall be stored off the ground with one end elevated to provide drainage and shall be protected from the elements with a waterproof covering, ventilated to avoid condensation.

PART 2 - PRODUCTS

2.01 MATERIALS AND COMPONENTS

- A. Steel Roof Deck: Roof deck units shall be fabricated from steel conforming to AISI Section 1.2. The delivered thickness of the uncoated steel shall not be less than 95% of the design thickness. Steel roof deck shall be manufactured from steel conforming to ASTM Designation A611, Grades C, D or E or A446, Grades A, B, C, D, E or F,

or equal, having a minimum yield strength of 33,000 pounds per square inch, unless noted otherwise. The maximum working stress shall not exceed 20,000 pounds per square inch. The unit design stress shall in no case exceed the minimum yield strength of the steel divided by 1.65 for specific design uniform loads. The unit design stress shall be increased 33-1/3% for temporary concentrated loads provided the deck thus required is no less than that required for the specific design uniform loads.

1. Finish: Prime-painted or Hot-dipped galvanized G60 - see drawings.
- B. Fabricate roof sump pan of 14 gage sheet steel, flat bottom, sloped sides, recessed 1-1/2 inches (38 mm) below roof deck surface, bearing flange 3 inches (75 mm) wide, watertight.
- C. Metal Closure Strips: 20 gage sheet steel; of required profiles and size.
- D. Flexible Closure Strips: Manufacturer's standard vulcanized, closed-cell, synthetic rubber.
- E. Galvanized Metal Spot Primer: Wilbur & Williams "Zinc Shield," Devoe "Zinc Prime 100," Tnemec "Tneme-Zinc," or approved equal, meeting Military Specifications MIL-P-21035.
- F. Spot Primer (Painted Decks): Tnemec "Series 37 Chem Prime," Wilbur & Williams "Prime Line," or approved equal, universal phenol-alkyd primer.
- G. Ridge and Valley Plates: Fabricate ridge and valley plates of sheet steel of the same quality, finish and gauge as the deck units; each leg not less than 2-1/4" wide, bent to provide tight-fitting closure with deck units. Provide plates in 10' lengths where possible.
- H. Welding Materials: Applicable AWS D1.1 type required for materials being welded.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Erect steel decking as recommended by the SDI and in accordance with approved Shop Drawings. Properly align and level on structural supports. Deck shall span over at least three supports.
- B. Welding shall be done in strict accordance with the AWS D1.1 requirements by a welder licensed for the welds they will be performing. Steel deck and supports shall be clean, dry and free of frost.
- C. Place roof deck with edges up and flutes at right angles to supports bearing onto the support a minimum of 1-1/2". End laps shall always occur over supports. Minimum end lap shall be 2". Lap all sheets one-half flute at side laps. Unless indicated otherwise, attach sheets to supporting members with nominal 5/8 inch diameter puddle welds or equivalent at all side laps, plus a sufficient number of interior ribs to limit the spacing between adjacent points of attachment to 18 inches maximum. For spans greater than 5 feet, the side laps shall be fastened together at a maximum spacing of three feet, unless indicated otherwise. Fillet welds when used, shall be at least one inch long. Weld metal shall penetrate all layers of deck material at end laps and side joints, and shall have good fusion to the supporting members. The use of fastening methods other than

welds, such as self-drilling fasteners, may be used provided that equivalence to the welded method can be shown by approved test data and shall be subject to approval.

- D. Unless otherwise detailed, install minimum 6 inch wide cover plates where deck changes direction. Weld in place at maximum 12 inches o.c.
- E. Immediately after installation, touch-up welds, burned areas and damaged spots with specified prime paint.
- F. Install sheet steel closures and angle flashings to close openings between deck and walls, columns, and openings.
- G. Position roof sump pans with flange bearing on top surface of deck. Weld at each deck flute.
- H. Install flexible closure strips with adhesive in accordance with manufacturer's instructions, completely sealing space.
- I. Provide solid wood blocking in deck cells under roof top unit curbs.

END OF SECTION

SECTION 05410

LIGHT GAUGE STRUCTURAL STEEL FRAMING

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. The work covered by this section includes all labor, materials and equipment necessary for design, fabrication, delivery and erection of load bearing steel studs, steel joists and rafters. Also included are the studs behind the brick veneer.

1.02 RELATED SECTIONS

- A. Section 05120: Structural Steel.
- B. Section 05210: Steel Joists and Joist Girders.

1.03 REFERENCES

- A. All design, fabrication and erection of light gauge structural steel framing shall be in accordance with the following specifications and codes, latest edition including any revisions and addenda, unless modified by these specifications.
1. "Specification for the Design of Cold Formed Steel Structural Members" by the American Iron & Steel Institute, AISI.
 2. AWS D1.1 - Structural Welding Code by the American Welding Society.
 3. ASTM A90 - Test Method for Weight of Coating on Zinc-Coated (Galvanized) Iron or Steel Articles.
 4. ASTM A446 - Steel Sheet, Zinc-Coated (Galvanized) by Hot Dip Process, Physical (Structural) Quality.

1.04 QUALITY ASSURANCE

- A. Manufacturer: Company specializing in light gauge structural steel framing components, including trusses, with three years minimum experience.
- B. Calculate structural properties of framing members in accordance with AISI requirements.
- C. Field and shop welds shall be made by AWS certified welders only. Welding procedures shall be pre-qualified in accordance with AWS qualification procedures.
- D. Testing and Inspection Agency: The Owner may hire an independent testing and inspection agency for field inspection. The independent inspector shall perform testing, inspect and evaluate connections, prepare test reports and verify conformance to this specification and referenced standards.
1. Only AWS Certified Welding Inspectors shall inspect, evaluate and test welds.

2. Correct deficiencies in the light gauge structural steel work identified by the testing and inspection agency at no additional expense to the Owner. Subsequent tests to confirm the adequacy of corrected work will be at the Contractor's expense.

1.05 SUBMITTALS

- A. All studs are based on Dietrich Industries Products. Should other products be provided, submit complete selection data and manufacturer's catalogue. Calculation of equal studs shall be stamped by a Professional Engineer.
- B. Provide product data for studs, roof rafters and ceiling joist members and accessories. Describe materials and finish and structural properties including minimum yield, gauge and section properties, and installation instructions.

PART 2 - PRODUCTS

2.01 FRAMING MATERIALS

A. Walls:

1. Studs: ASTM A446, 33 ksi minimum, Grade A, galvanized sheet steel, formed to channel shape.
 - a. Size: As indicated in the contract documents.
 - b. Gauge: 16 GA, unless otherwise noted.
2. Runners (Track): Same size as steel studs, 14 gauge, 2-3/4" high lip.
3. Bridging: Manufacturer's flat strap or V-bar bridging, 18 gauge.

B. Roof Rafters and Ceiling Joists:

1. Rafters: ASTM A446, 50 ksi, Grade D, galvanized sheet steel formed to channel shape. Size and gauge as indicated on the contract drawings.
2. Bearing Clips: Size and gauge per contract drawings.
3. Bridging: Manufacturer's solid and V-bar or flat strap bridging, 16 gauge. Solid bridging shall be 16 gauge, 2" less in depth than the rafter.
4. Runners (Track): Same size as studs, 16 gauge, 3" legs

C. Bridging: Manufacturer's solid and 16 gauge V-bar or flat strap bridging. Solid bridging shall be 8" in depth, 16 gauge.

D. Connections:

1. Provide self-drilling, self-tapping screws, Buildex No. 12-14, or approved equal for connecting 18 gauge members.
2. Provide welded connections where shown.
3. 14 GA bent clip angles.

E. Web Stiffeners:

1. 4" with 1-1/4" legs.

2.02 FINISHES

- A. Galvanizing: G60 coating class.

- B. Primer: FS TT-P-645, touch-up for galvanized surfaces.

PART 3 - EXECUTION

3.01 ERECTION, GENERAL

- A. Verify that substrate surfaces and building framing components are ready to receive work.
- B. Beginning of installation means acceptance of existing conditions.
- C. Materials damaged (i.e., rusted, dented, bent or twisted) shall be discarded.
- D. Place a wall stud directly under each roof rafter.
- E. Place non-bearing wall studs backing up brick veneer at 16" on center, except within 12'-0" of any corners; 12" on center.

3.02 ERECTION OF WALLS

- A. Tracks and tubes shall be securely anchored to the supporting structure. Complete uniform and level bearing support shall be provided for the bottom track.
- B. At track butt joints, abutting pieces of track shall be securely anchored to a common structural element, or they shall be butt welded or spliced together.
- C. Studs shall be plumbed, aligned and securely attached to both upper and lower tracks. Connect track to each stud flange.
- D. Construct wall corners using minimum three studs. Double stud at wall opening, door, and window jambs.
- E. Erect load bearing wall studs one piece full length. Splicing of studs is not permitted.
- F. Install intermediate wall studs above and below openings to match wall stud spacing.
- G. Touch-up field welds and damaged galvanized surfaces with primer.
- H. Finished installation shall be level and plumb within a tolerance of 1/8 inch in 10 feet horizontally and vertically. Maximum deviation from plan or section dimension shall not exceed 1/8 inch. Spacing of studs shall not be more than 1/8" from design spacing, providing that cumulative error does not exceed requirements of finishing materials.
- I. Temporary bracing shall be provided and left in place until work is permanently stabilized.
- J. Torch cutting of load bearing members will not be permitted.

- K. Install headers for all wall openings larger than the stud spacing. Provide jack studs to support each end of header. Jack studs must seat squarely in the lower track and be properly attached to it.
- L. Install bridging and sheathing to stud flanges before loads are applied to wall. Provide bridging on studs not indicated to receive plywood sheathing at 4'-0" o.c. max.
- M. Top runners at exterior walls shall consist of a 14 gauge runner attached to the structure. Attach runners at 12" o.c. Cut studs 1-1/2" short to allow for structure deflection. Slip studs into 2-3/4" high 14 gauge runner attached to structure, except under mezzanine, studs will be tight to structure. Reinforce studs with continuous horizontal cold-rolled channels.

3.03 ERECTION OF RAFTERS, JOISTS AND BRACES

- A. Rafters and joists shall be located directly over and secured to load bearing wall or steel beam per contract drawings.
- B. Flat strap or V-bar bridging shall be provided on the bottom flange of the rafters. Provide solid bridging at 10'-0" o.c. maximum and in the first two and last two rafter spaces. Bridging shall be completely installed before loads are applied to the rafters.
- C. Flat strap or V-bar bridging shall be provided on the bottom and top flanges of the joists. Provide solid bridging at 10'-0" o.c. maximum and in the first two and last two joist spaces. Bridging shall be completely installed before loads are applied to the joists.
- D. Do not cut flanges of rafters or joists at bearings.
- E. A minimum of two screw fasteners or 1" long fillet weld each side shall be provided at any connection not otherwise detailed or specified.
- F. Touch-up field welds and galvanized surface with primer.

END OF SECTION

SECTION 05500

METAL FABRICATIONS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. All miscellaneous metalwork indicated and herein specified, including:
 - 1. Channel and plate frames.
 - 2. Lintels.
 - 3. Miscellaneous fabrications and fasteners.

1.02 SUBMITTALS

- A. Submit Shop Drawings showing fabrication and installation for metal fabrications.
- B. Submit design calculations, stamped by a Registered Professional Engineer, for steel stair design.
- C. Submit Shop Drawings and calculations in accordance with Section 01300.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. General:
 - 1. Metals shall be free from defects impairing strength, durability, or appearance, and of best commercial quality for purposes specified. All metals shall be made of new materials.
 - 2. Metals shall be made with structural properties to sustain safety or withstand strains and stresses to which normally subjected, true to detail, clean, straight, with sharply defined profiles, curved work to true radii, and unless particularly noted, with smooth finished surfaces.
- B. Structural steel shall conform to the Standard Specification, ASTM, for "Structural Steel for Building," A-7 or A-36.
- C. Bolts: ASTM A325 or A307.
- D. Shop Paint: Manufacturer's standard metal protective paint.

2.02 FABRICATION - GENERAL

- A. To greatest extent possible, work shall be fitted and shop-assembled ready for erection.
- B. Work shall be executed in strict accordance with Drawings, details, and approved Shop Drawings.

- C. Shop connections shall be riveted or welded, and where indicated blind riveted. Rivets, screws, and kindred fastenings shall be countersunk into exposed work and finished flush therewith.
- D. Joining of Metals: Joining and intersections of metals shall be accurately made, and tightly fitted, and made in true planes, with adequate fastenings; bolted work shall be screwed up tight and threads nicked to prevent loosening.
- E. Holes and Connections: Provide holes and connections for the work of other trades and make connections thereto, unless otherwise indicated.
- F. Welding:
 - 1. Welding and equipment shall conform to American Welding Society's Code for Welding in Building Construction, latest edition (subject to State and local laws and ordinances).
 - 2. Fabricators and welders shall be licensed operators.
 - 3. All exposed welded joints shall be ground smooth.

PART 3 - EXECUTION

3.01 ERECTION AND INSTALLATION

- A. Work shall be made and erected square, plumb, straight, and true, accurately fitted and with tight joints and intersections. Riveted parts, where so indicated, shall be made with countersunk heads of blind rivets. Work shall be accurately reinforced and anchored in place. Exposed work shall be finished smooth, with even, close joints and neat connections, unless otherwise indicated.
- B. All metal to metal jointing of exterior work, where necessary, shall be caulked and made water and weathertight, and the work herewith shall be so warranted.
- C. Fabricator shall be responsible for locations and levels of all work of this Section, except such parts as may be delivered to others and set by them. In such cases, fabricator shall assist others in properly locating said parts.
- D. Structural Steel Door Frames:
 - 1. Set door frames plumb, level and square. Diagonal measurement from square shall not exceed 3/16".
 - 2. Set door frame head elevation at scheduled height from finish floor with a maximum variation of $\pm 1/4$ ".
- E. Bolts and Anchors: Provide bolts for fastening wood to metalwork, concrete and masonry. Anchor bolts for fastening metalwork and wood to concrete and masonry shall be hooked at one end.
- F. All work under this Section, except as otherwise specified, shall receive one coat shop paint before leaving Shop.
- G. All miscellaneous metals in contact with concrete or masonry at exterior walls shall have the contact surface treated with a brush coat of a bituminous based cement.

END OF SECTION

SECTION 06100

CARPENTRY

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Provide rough carpentry for all framing and where required for framing or support for Contractor's or Owner's equipment.
- B. Rough carpentry work includes:
 - 1. Wood framing.
 - 2. Sheathing.
 - 3. Wood blocking at all wall hung equipment including fire extinguishers, toilet partitions, accessories, shelving, door stops and any other Owner or Contractor supplied equipment.
 - 4. Nailers, blocking, furring and sleepers.
 - 5. Fire-treated plywood for all electric panels and interior partitions.
 - 6. Wood Siding
 - 7. Exterior wood Trim

1.02 SUBMITTALS

- A. Submit product literature and certificate of compliance for fire treated materials.
- B. Submit Shop Drawings indicating all blocking locations.
- C. Submit Shop Drawings in accordance with Section 01300.

1.03 PROTECTIVE TREATMENT

- A. All exterior and interior trim and finish woodwork shall be primed. All sides at the job as specified under Section 09900 - Painting, before erection.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Rough lumber shall be dressed four sides, kiln-dried, sound and free from splits, checks, shakes and wane and shall conform to the following grades:
 - 1. Studs, plates, and other structural lumber shall be S-P-F #2 grade and better, kiln dried, meeting the minimum stresses indicated on structural drawings unless otherwise noted.
 - 2. Construction Grade Eastern Hemlock or Eastern Spruce shall be used for blocking, nailers, strapping and other minor framing members where not otherwise designated.
- B. Treated Lumber: Lumber for roof nailers, curbing, cants and any wood used in conjunction with roofing shall be Wolmanized (CCA) pressure treated Southern Pine, by Koppers Company, or approved equal.

1. Fire-retardant treated wood and plywood at canopies along front of Shaw's. Treatment shall be Koppers Dricon FR-S, or Hoover Treated Wood Products, Inc. Pyro-Guard. Lumber shall be identified with U. L. stamp indicating product has code recognized classification for surface burning characteristics. Kiln dry materials after treatment. Treated material shall comply with ASTM E84, Class A.
- C. Plywood: Plywood shall comply with PS-1-74 and shall bear American Plywood Association stamp.
1. Plywood for Rough Framing: "CDX" APA rated sheathing, Exposure 1. Provide Structural 1 panels for shear walls. Fire-retardant treated at canopy along store front and all interior locations.
- D. Rough Hardware:
1. Nails, Spikes, and Staples: Galvanized for exterior locations, high humidity locations, and treated wood; plain finish for other interior locations; size and type to suit application.
 2. Bolts, Nuts, Washers, Lags, Pins, and Screws: Medium carbon steel, unless otherwise indicated; sized to suit application; galvanized for exterior locations, high humidity locations, and treated wood.
 3. Fasteners: Toggle bolt type for anchorage to hollow masonry, expansion shield and lag bolt type for anchorage to solid masonry or concrete, bolts or power activated type for anchorage to steel.
 4. Sheathing to Metal Framing: Hilti Kwik-Flex or Elco Dril-Flex; no substitution allowed, 10-24 x 1-1/4" wafer head #3.
- E. Clapboards: 1/2 inch x 6 inch; plain beveled; clear vertical grain Red Cedar; WWPA graded; S1S-2E; 8 to 16 foot lengths; rough side exposed.
- F. Exterior Wood Trim: Select white pine or cedar.
- G. Building Paper: Asphalt impregnated felt paper; 30 lb. behind brick.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Consult the Specifications under other Sections of these Specifications and any rough carpentry work or materials, which are not specified under these headings and which are necessary or required for the receiving and thorough completion of the work, including the work of any Contractor employed directly by the Owner, shall be done under this Section.
- B. Workmanship shall be first-class throughout. None but competent carpenters shall be employed. All framing shall be true and exact, and all work on completion shall present a clean, neat appearance with tight, square joints.

- C. Framing shall be in accordance with the Drawings and shall be closely fitted and accurately set to the required lines. All framing shall be rigidly spiked, bolted, anchored, nailed and fastened in place in the most secure and permanent manner. All framing members exposed to view in the finish structure shall be sanded smooth before installation. Care shall be taken in selecting of exposed members, and in preventing damage to them during construction. Correct any twisted members.
- D. Furnish and set all blocking required to erect all exterior and interior finish woodwork or wall materials, plumbing, and electric fixtures and other mechanical equipment, lookouts, wood bricks, rough bucks, blocking for Owner supplied shelving, and all blocking and furring necessary with roofing work.
- E. All wood nailers and bucks in connection with masonry and concrete shall be treated lumber.
- F. Rough Hardware: Furnish all hardware not requiring special finish, including nails, screws, anchors, anchor bolts, joist hangers, clip angles, etc., as required to erect and fasten the work.
- G. Perimeter Roof Nailers: Shall be installed at the perimeter of each roof level's curb flashing, expansion joints and similar penetrations.
 - 1. Anchor wood roof nailers to resist a force of 75 pounds per linear foot in any direction. The thickness of the nailer shall be such that the top of the nailer is flush with the surface to which the membrane is to be applied as shown on the roofing manufacturer's approved details.
- H. Clapboards
 - 1. Siding shall be accurately fitted and positioned without springing or otherwise forcing siding in place. Panels shall be spaced in accordance with manufacturer's recommendations.
 - 2. End joints shall be so alternated that at least two boards will be between joints on the same support. Shorter pieces shall be uniformly distributed throughout each area. Starter strips shall be provided as necessary to establish proper slant for siding. Ends of siding shall be pre-drilled, if necessary, to prevent splitting when nailed. Overlap siding 1 inch and nail into each support in accordance with approved recommendations of the siding manufacturer.
 - 3. Attach siding with ring shank stainless steel nails.
- I. Install building paper starting from low to high overlapping edges 2-1/2" minimum and ends 6". Attach paper with tin disk and non-corrosive fasteners. Building paper shall not be left exposed more than 30 days. At brick veneer, seal end laps with asphalt mastic. Coordinate installation with masonry flashing installation.

END OF SECTION

SECTION 07200

BUILDING INSULATION

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. All building insulation work.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Roof insulation specified under Section 07210.

1.03 SUBMITTALS

A. Submit manufacturer's literature, in accordance with Section 01300, for all materials.

B. Submit manufacturer's material safety data sheets (MSDS) for all system products to be utilized prior to receipt for record.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Perimeter and Rigid Insulation: 2" thick, unless indicated otherwise, extruded polystyrene, square edge, 20 psi compressive strength, "K" factor of 0.18, 2.2 lb./cu. ft. density and 30 psi compressive strength. Shall be manufactured by Dow Chemical, Formular, Amaco, or approved equal.

B. Blanket and Acoustical Insulation: Unfaced fiberglass insulation with an R-value of 3.16 per inch, full depth of cavity, sized for steel stud spacing.

C. Compressible material expanded polystyrene foam with a 1.0 PCF density.

D. Foam Insulation: On-site foam-in-place insulation shall be Froth-Pac 1.75-25 FS Class 1 foam manufactured by Insta-Foam Products, Inc., or approved equal.

PART 3 - EXECUTION

3.01 PROTECTION

A. Materials shall be protected and kept dry, both in transit and at the job site.

3.02 INSTALLATION

A. Spot cement perimeter insulation to foundation walls prior to backfilling.

- B. Pack all voids around wires that penetrate into exterior and interior wall cavities with box and wire at point of entry before installation of wall batts.
- C. Place friction fit wall insulation between framing members to completely seal exterior surfaces. Split insulation and install on both sides of wiring. Secure insulation with "Insul-Fast" continuous metal support tabs 5 feet on center, starting at the top on each stud.
- D. Seal narrow cavities in framing with foam insulation.
- E. Install foam sealant to a minimum depth of 1", sealing roof deck flutes and construction cracks and gaps where outside air and cold can infiltrate, providing an airtight building envelope.

END OF SECTION

SECTION 07210

ROOF INSULATION

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Furnish and install all roof insulation and related items for single-ply membrane roof systems.

1.02 SCHEDULE OF INSULATION TYPES

<u>Roof Area</u>	<u>Insulation Layer(s)</u>	<u>R-Value</u>	<u>Type</u>	<u>Method of Attachment</u>
All Roofs over enclosed interior spaces	1 layer	R-20 (Min. of isoboard)	Polyisocyanurate (FM I-90)	Mechanically attached
Canopy Roofs cyanurate	1 layer	R-7.1	Polyisocyanurate (FM I-90)	Mechanically attached
Drainage Crickets	As required	As required	Polyisocyanurate min. slope 1/4"/foot	Mechanically attached 1" min at low point w/ tapered reducer strip of wood fiberboard

1.03 SUBMITTALS

- A. All submittals are to be in conformity to Section 01300.
- B. If the insulation is supplied through a different manufacturer than the roofing membrane system manufacturer, then the insulation manufacturer shall submit a written warranty covering the value of the insulation materials and installation. The warranty shall state the insulation will retain 80% of its established aged thermal and dimensional values for a period of twenty years commencing from the date of substantial project completion.

1.04 GENERAL REQUIREMENTS

- A. Weather: Work shall be performed only during dry weather and applied to dry surfaces. Manufacturer's recommendation and requirements for type of weather application shall be followed.
- B. Inspection: Shaw's reserves the right to inspect and reject defective and improperly installed insulation.
- C. Relation with Work of Other Trades: All items of other trades that are connected to or affect the insulation work shall be properly coordinated so as not to affect warranty(s).

- D. Insulation fasteners and disc shall have Factory Mutual and manufacturer's approval for the system specified.
- E. Mechanically attached insulation installation shall be in accordance with Factory Mutual I-90 windstorm roof system classification.
- F. All roofing work shall be the responsibility of a single Roofing Subcontractor, and all materials and methods shall be approved by the manufacturer of the roofing membrane and accepted by the Designer.
- G. Comply with roofing covering requirements of the local building code, FM and UL recommendations and requirements.
- H. Insulation shall be stored at least four inches above the ground and roof on pallets. On the roof, pallets shall have a layer of 1" polystyrene under their entire area.
- I. Stored insulation shall be completely covered at all times with "breathable" tarps. Factory applied packaging in and of itself is not acceptable and shall be randomly cut to alleviate condensation.

PART 2 -- PRODUCTS

2.01 MATERIALS

- A. Insulation shall be polyisocyanurate. The polyisocyanurate insulation shall have a minimum aged "R" value of R-20 and a minimum thickness of 2.75 inches. Stricter value governs. Insulation shall be closed-cell polyisocyanurate core integrally bonded to asphalt/fiber-glass felt facing. The insulation shall have a minimum aged "R" value as indicated in accordance with RIC/TIMA Technical Bulletin 281-1 and shall have minimum density of 2 pounds per cubic foot. Insulation board size shall be 4'-0" x 8'-0".
- B. All insulation must be acceptable as a suitable substrate by the membrane manufacturer and Factory Mutual.
- C. Insulation around perimeter edges and crickets shall be prefabricated tapered system of approved closed-cell-foam polyisocyanurate as specified above. Minimum slope shall be 1/8" per foot.
- D. Tapered edge strips shall be 18" wide asphalt impregnated wood fiberboard to be used where specified and in conformance with Federal Specification LLL-I-535B, Class C.
- E. All fasteners for insulation shall meet corrosion-resistance requirements as described in Factory Mutual Approval Standard 4470 dated April 1986 (Class 1). Plates shall be provided by the fastener manufacturer to be used with the proposed fastener. Plates and fasteners shall be approved by Factory Mutual and the membrane manufacturer for use with the proposed system. Fasteners shall be a minimum number 14 size wire.
- F. Wood fiberboard insulation shall conform to ASTM C-08, ASTM D1621 and Federal Specification LLL-I-535B, Class C.

PART 3 - EXECUTION

3.01 QUALITY CONTROL

- A. Insulation shall be installed over a clean, dry and properly prepared roof surface acceptable to the membrane manufacturer, Roofing Contractor and Shaw's Project Representative.
- B. All installed insulation shall be completely covered with the finished roofing system each day.
- C. All insulation must be fully protected from precipitation and condensation damage at all times.
- D. Insulation shall be stored covered with waterproof "breathable" tarps in a manner acceptable to the manufacturer and the Designer. Manufacturer's shrink wrap is not acceptable as a waterproof tarp. If stored on the roof, insulation shall be placed on pallets at least 4" high with a 1" buffer of EPS board underneath to prevent puncturing of the roof membrane. Insulation shall not be stored in low areas and shall be stored so as not to overstress the structure.
- E. Care shall be taken so as not to damage the roof structure, deck and roofing system or individual components during material stocking operations.

3.02 WORKMANSHIP

- A. The insulation shall be neatly cut to fit around roof penetrations and projections.
- B. Ends and sides of insulation boards on exposed steel deck shall be supported by the top flute of the deck with a minimum of 1" of bearing area.
- C. No piece of insulation shall be less than two square feet after cutting to fit.
- D. The top surface of the insulation shall be flush with the top surface of the wood blocking within a tolerance of +0" and -1/16" with respect to blocking.
- E. Polyisocyanurate insulation for mechanically attached EP shall be mechanically attached to the roof deck at a rate of 1 fastener per 6.4 square feet (5 fasteners per 4'x 8' board), in a Factory Mutual I-90 windstorm classification approved pattern, with a minimum 1" penetration through lower-most section of deck without cupping the disc or breaking the insulation or its facer.
- F. Where more than one layer of insulation is installed, stagger joints of succeeding layers from first layer, a minimum of 12" in each direction.
- G. In no case shall there be less than 2 fasteners per piece of insulation.

- H. Screws shall be installed utilizing automatic, positive clutch disengaged and adjustable nosepiece.
- I. Fasteners which require pre-drilling shall be drilled to a minimum depth as recommended by the fastener manufacturer or required by Factory Mutual to permit full seating of the fastener into the plate.
- J. All tapered polyisocyanurate and wood fiberboard insulation shall be mechanically attached using same procedures as A-I above.
- K. Install tapered edge strips at edges of tapered insulation to provide smooth transition to flat areas, free of gaps and voids.

END OF SECTION

SECTION 07310

ASPHALT SHINGLES

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Provide and install asphalt shingles, including hip and ridge shingles and all other related accessories for all roof areas as indicated herein and on plans.
- B. Provide and install self-adhering rubberized asphalt waterproofing membrane and felt shingle underlayment as indicated herein and on the manufacturer's specifications.

1.02 QUALITY ASSURANCE

- A. All materials used as a component of the roofing system shall be supplied or approved in writing by the roofing system manufacturer. All materials shall be installed to serve their intended function.
- B. All roofing work shall be applied in strict accordance with the provisions of these Design Criteria. No deviations will be permitted without prior written consent from Shaw's Project Representative. Should a conflict between this Specification and the manufacturer's requirements arise, the most restrictive provision, as determined by Shaw's Project Representative, shall govern.
- C. Comply with governing codes and regulations. Provide products of acceptable manufacturers that have been in satisfactory use in similar service for five years. Use experienced installers. Deliver, handle and store materials in accordance with the manufacturer's instructions.

1.03 REFERENCE

- A. Asphalt Roofing Manufacturers Association.
- B. Local State Building Code.
- C. National Roofing Contractor's Association.

1.04 SAMPLES AND SUBMITTALS

- A. All submittals are to be in accordance with Section 01300.
- B. Submit each of the following to the Architect for approval prior to application.
 - 1. Fasteners.
 - 2. Manufacturer's sample guarantee.
 - 3. Shingles (color selection chart).
 - 4. Felt underlayment.
 - 5. Waterproofing membrane.
 - 6. Sealants: Plastic cement, lap and seam sealant.
 - 7. Sample of shingle guarantee.

8. Sample of Contractor's two-year guarantee.

C. Submit Manufacturer's Material Safety Data Sheets (MSDS) for all system products prior to receipt for record files.

1.05 PRODUCT HANDLING

A. Deliver shingles, underlayment and fasteners in original, unopened containers and bundles with labels intact.

B. Store materials off ground covered with waterproof covering and protected against damage by contamination, dirt, dust, staining, or intrusion of moisture. Do not stack bundles of shingles more than 4 ft. high. Store rolled goods on end.

C. All materials storage shall also meet the manufacturer's requirements if more stringent.

1.06 JOB CONDITIONS

A. Upon completion of the installation, an inspection shall be made by a representative of the system manufacturer to ascertain that the roofing system has been installed according to the applicable manufacturer's specifications and details.

B. Roofing shall only be applied in dry weather. Roofing shall not be applied when ambient air temperature is less than 40EF.

C. Roofing shall only be applied to properly prepared dry areas. Completed roof areas shall not be trafficked.

D. All new and temporary construction, including equipment and accessories, shall be secured from wind damage or blow-off. All temporary work or work by others shall be replaced with new materials at no additional cost.

1.07 WARRANTY

A. Manufacturer shall guarantee shingles for 30 years.

B. Upon completion of the work and prior to acceptance of the work, the Roofing Contractor shall submit a guarantee to Shaw's and the Owner. The Roofing Contractor's guarantee shall be for a two (2) year period and shall cover any defect in the work or materials.

1.08 CODES

A. Except as modified by the requirements of other governing codes and by this Specification, conform to the provisions and recommendations of the following codes and standards:

1. Factory Mutual Class I Rating.
2. Underwriters' Laboratories (UL) Class A.
3. UL 790, Resistance to External Fire.
4. UL 947, Wind Resistance.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Shingles:
1. Asphalt shingles shall be 340 pounds per square minimum weight, four bundles per square, fiberglass based square cut, three tab type with small colored ceramic granules and self-sealing adhesive on the face of each shingle, made to be used in the northeast region of the United States. Shingles shall be labeled and listed by Underwriters' Laboratories for Class A fire and wind resistance.
 2. Shingles shall be "Timberline" Slate Blend as manufactured by GAF, Celotex "Dimensional III" Shake Shingle Slate Blend, Elk "Prestique I" Antique Slate, or Certainteed "Independence Shingle" Colonial Slate. Manufacturer shall warranty shingles for thirty (30) years against manufacturer defects and wind damage. Color shall be as selected by Shaw's.
 3. Shingles, including hip and ridge shingles shall conform to ASTM E108, D3161, D1922, D3018-82 Type 1 Specifications and D3462-87, UL Class A label. Without exception, shingles shall meet or exceed Elmendorf tear test requirements.
- B. Underlayment shall be 15-pound, non-perforated, asphalt saturated rag felt conforming to ASTM D-226-77, Type 1 Specifications.
- C. Fasteners shall be hot-dipped galvanized or aluminum, 11 or 12 gauge, barbed shank, 3/8" head, sharp pointed conventional roofing nails of sufficient length to penetrate at least 3/4" into solid decking or to just penetrate through plywood sheathing. Pneumatically actuated fasteners will be permitted with roof shingle manufacturer written approval of the proposed nailing system.
- D. Self-adhering rubberized waterproofing membrane shall be Bithuthene Ice and Water Shield as manufactured by W. R. Grace.
- E. Plastic Cement: ASTM D2822, asphalt type, with mineral fiber components (no asbestos), free of toxic solvents, capable of setting within 24 hours at temperatures of 75EF and 50% RH No.19 Karnack flashing cement by Karnack.
- F. Lap Cement: Fibrated cutback asphalt type, recommended for use in application of underlayment, free of asbestos and toxic solvents, No. 16 double coverage cement by Karnack.
- G. Shaw's Project Representative and the Architect shall be the sole judges of the acceptance for products submitted as "approved equal."

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Install underlayment and shingles in strict accordance with manufacturer's printed instructions, copies of which shall be submitted to Shaw's Project Representative prior to the start of the roofing work. Variations between the manufacturer's printed instructions and these Specifications shall be noted in the Contractor's submittal.
- B. Examine all roof surfaces to receive shingles and correct any conditions detrimental to proper installation of shingle roofing. Beginning of work constitutes acceptance of such surface.
- C. All plywood sheathing shall have appropriate spacer gaps between sheets to accommodate swelling. Immediately notify the Architect if substrate is unacceptable for shingling. Gutter lining shall be .060" uncured EPDM.
- D. Note that fire-rated CDX sheathing may be used under shingles. It must be covered immediately after installation to prevent delamination. The Contractor shall remove and replace any sheathing that warps or delaminates due to improper installation or inadequate weatherproofing.
- E. Install drip edge per shingle manufacturer's specifications. Drip edge shall extend on the roof 3" and down the face a minimum of 2". It shall be nailed at 4" o.c.
- F. Lay single layer of self-adhering rubberized waterproofing membrane shingle fashion for a width of 6' each side of valley center, before applying shingles, lapping each course over lower course 4" minimum at horizontal joints and 6" side lap at end joints. Lap membrane 6" from both sides over hips and ridges. Cover remaining deck with underlayment. Secure underlayment to deck with sufficient fasteners to hold in place until shingles are applied.
- G. Flashing Against Vertical Wall: Turn underlayment 4" up vertical wall. Install new 7" x 11" step flashing over the end of each course of shingles in a stepping fashion, keeping horizontal leg of flashing concealed. Use 2" minimum side laps. Fasten with 1" annular ring aluminum nails at top.
- H. Starter strip course shall consist of 12" wide strips of 75# mineral roll roofing. It shall overhang eaves and rakes by 1/4" to 3/8".
- I. Install shingles to provide uniform distribution of color blend.
- J. Place shingles in straight coursing pattern with 5" weather exposure to produce double thickness over full roof area. Leading edge of first course shall be exactly aligned with leading edge of starter strip, i.e., 1/4" to 3/8" beyond eaves or rakes beyond fascia boards.
- K. Apply shingles in parallel courses, parallel to eaves with full shingle even with starter course. Racking is not permitted.

- L. Over sloping roof, nail shingles to deck with approved nails at rate of four nails per shingle. Use shingle tab cement per manufacturer's and Factory Mutual's instructions.
- M. Upon completion of work, provide Shaw's with four unopened bundles of shingles (100 sq. ft.) of the same type and lot as those installed. Provide signed receipts per closeout procedures.

END OF SECTION

SECTION 07475

METAL SOFFITS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Furnish all labor and materials to install linear aluminum soffits.

1.02 RELATED WORK

- A. Section 09500: Acoustical Treatment.

1.03 SUBMITTALS

- A. Shop Drawings: Submit Shop Drawings of material and installation details.
- B. Submit samples of soffit material, including molding and trim, for approval.
- C. Submit Shop Drawings and samples in accordance with Section 01300.

1.04 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Protect materials from damage during transportation and storage. Store panels under cover, in dry location. Materials scarred or dented shall not be used.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Linear Aluminum Soffit: Shall be Donn Paraline II, Hunter Douglas Luxalon Box Square Edge, or Chicago Interfinish Planar Square Edge Plus, .024 aluminum pan, linear metal ceiling system with integral recessed flange, or approved equal. Finish to be smooth with matte black flange. Provide perforated pans at indicated spacing.
 - 1. Suspension System: Shall be Donn aluminum symmetrical carrier suspension system, or approved equal, with main support tees capable of supporting 16 lb. per lineal foot on a four foot span.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Install linear soffits according to manufacturer's instructions and approved Shop Drawings.
- B. Provide 1/2" x 3/4", 16 gauge steel furring channel and vertical supports around perimeter of light fixtures in soffits.

- C. Wires used to suspend any system shall be not less than 12 gauge. Each hanger shall be capable of supporting 150 lbs.
- D. Linear aluminum soffits shall be constructed to resist a 30 psf wind uplift. Provide galvanized steel stud down post as required by the linear soffit manufacturer. Provide trim channel at vertical surfaces, color to match panel.
- E. Construct access panels using downward access door kit. Panels shall be square and flat, with uniform margins at perimeter. Provide concealed safety chain to limit door swing and prevent bending.
- F. Upon completion, clean all panels of all dirt, excess sealant, and other foreign substances.

END OF SECTION

SECTION 07530

MECHANICALLY ATTACHED SINGLE-PLY ROOFING SYSTEM

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Furnish and install a Carlisle mechanically attached MBP roofing membrane, accessories and related work as indicated on the drawings and as specified.

1.02 QUALITY ASSURANCE

- A. All materials used as a component of the roofing system shall be supplied or approved in writing by the roofing system manufacturer. Warrantor shall be the manufacturer of the membrane.
- B. The complete roofing system shall be installed by a pre-approved roofing Contractor licensed, factory trained and approved by the roofing system manufacturer and employing full time personnel experienced and skilled in the application of the manufacturer's roofing system. Provide at least one thoroughly trained, full time and experienced superintendent trained by Carlisle on the job at all times roofing work is in progress. The Contractor shall have a minimum of 3 years experience installing the system, have installed a minimum of 500,000 square feet and shall have a manufacturer's installation rating of 9.5 or better. The roofing contractor shall be fully knowledgeable of all requirements of the contract documents and shall make themselves aware of job site conditions that will affect their work. Shaw's and Carlisle's approval of the Roofing Contractor is required.
- C. All roofing work shall be applied in strict accordance with the provisions of the specification criteria. No deviations shall be permitted without written consent from Joe Carbine/National Account Manager, Carlisle SynTec Incorporated and Shaw's Project Representative. Should a conflict between this specification and the manufacturer's requirements arise, the most restrictive provision as determined by Shaw's Project Representative, shall govern.
- D. Upon completion of the installation, an inspection shall be made by the system manufacturer's non-sales technical representative to ascertain that the roofing system has been installed according to the applicable manufacturer's specifications and details, and the contract drawings. No "early bird" warranty will be accepted. The results of the warranty inspection shall be submitted in writing to Shaw's for their review and records. Warranty commencement shall be the same date as substantial project completion.
- E. The Contractor shall provide National Account Manager for, Carlisle SynTec Incorporated, Shaw's Project Representative and Shaw's insurance underwriter with a minimum of 72 hours advance notice of the pending membrane manufacturer's warranty inspection. No inspection shall be considered valid by the Designer and Shaw's unless such notice is provided and if Shaw's is not present.

1.03 PROJECT CONDITIONS

- A. Proceed with roofing work only when weather conditions are in compliance with the manufacturer's recommended limitations, and when conditions will permit the work to proceed in accordance with the manufacturer's requirements and recommendations. No roofing work shall be performed when the temperature is below that recommended by the system manufacturer. Manufacturer's recommendations and requirements for extreme weather conditions shall be followed, i.e., cold weather application for temperatures below 40°F.
- B. Proceed with work so new roofing materials are not subject to construction traffic. When necessary, new roof sections shall be protected and inspected upon completion for possible damage.
- C. New roofing shall be complete and weathertight at the end of the work day.
- D. Contaminants such as grease, fats and oils shall not be allowed to come in direct contact with the roofing membrane.
- E. Materials shall be applied to properly prepared dry areas.
- F. Roofing shall be applied only in dry weather.

1.04 REFERENCES

- A. ASTM: American Society for Testing and Materials.
- B. FM: Factory Mutual Research Corporation:
 - 1. Loss and Prevention Data Sheet I-28 and I-29.
 - 2. Approval Standard 4470.
 - 3. Loss and Prevention Data Sheet I-29 and I-7.
- C. UL: Underwriters' Laboratories, Inc.
 - 1. UL 790: Tests for Fire Resistance of Roof Covering Materials.

1.05 SUBMITTALS

- A. Shop Drawings and manufacturer's literature shall be submitted to Joe Carbine/National Account Manager, Carlisle SynTec Incorporated, Shaw's Project Representative and Shaw's Insurance Underwriter for approval.
- B. Submit manufacturer's literature and data sheets on each component of the roofing system.
- C. Blank sample of manufacturer's and Contractor's warranty forms.
- D. A letter from the membrane manufacturer acknowledging the condition of the roof application.
- E. Submit manufacturer's approved Shop Drawings and sheet layout plan(s), including seam and end lap locations, perimeter details, and flashing details. Customized detail sheets shall be prepared by Carlisle, showing each condition and approved installation method conforming with the construction drawing constraints and details.

1.06 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Materials shall be delivered in their original unopened containers.
- B. Deliver materials to the job site in the manufacturer's original, unopened containers or wrappings with the manufacturer's name, brand name and installation instructions intact and legible. Deliver in sufficient quantity to permit work to continue without interruption.
- C. Comply with the manufacturer's written instructions for proper material storage.
 - 1. Store Sure-Weld membrane in the original undisturbed plastic wrap in a cool, shaded area and cover with light-colored, breathable, waterproof tarpaulins. Sure-Weld membrane that has been exposed to the elements for approximately 7 days must be prepared with Sure-Weld Membrane Cleaner prior to hot air welding.
 - 2. Store curable materials (adhesives and sealants) between 60°F and 80°F in dry areas protected from water and direct sunlight. If exposed to lower temperature, restore to 60°F minimum temperature before using.
 - 3. Store materials containing solvents in dry, well ventilated spaces with proper fire and safety precautions. Keep lids on tight. Use before expiration of their shelf life.
- D. Insulation shall be on pallets, off the ground and tightly covered with waterproof materials.
- E. Materials which are found to be damaged shall be removed and replaced at the applicator's expense.
- F. The loads of construction shall not exceed 25 pounds per square foot.
- G. Materials shall be delivered in sufficient quantity to allow continuity of the work.
- H. Weather protection shall mean the temporary protection of that work adversely affected by moisture, wind, heat, and cold by covering, patching and sealing, enclosing, ventilating, cooling and/or heating.

1.07 PROJECT/SITE CONDITIONS

- A. Roof system shall be designed to meet FM Class 1, and I-90 requirements.
- B. Prior to the commencement of work, the Contractor shall inspect all roof surfaces to ensure their compliance with the provisions of this specification and the manufacturer's published literature. No extra work shall be charged to Shaw's for Contractor's failure to do so.
- C. All surfaces shall be smooth, dry, clean, free of fins or sharp edges, loose or foreign materials, oil or grease.
- D. No work shall proceed when moisture is present on the roof or in the materials.
- E. Completed roof areas shall not be trafficked.

- F. Temporary waterstops shall be installed at the end of each work day and shall be removed before proceeding with the next day's work per manufacturer's published specification.
- G. Do not overload any portion of the building, either by use of or placement of equipment, storage of debris, or storage of materials.
- H. Protect against fire and flame spread. Maintain proper and adequate fire extinguishers.
- I. Take precautions to prevent drains from clogging during the roofing application. Remove debris at the completion of each day's work and clean drains, if required. At completion, test drains to ensure the system is free running and drains are watertight. Remove strainers and plug drains in areas where work is in progress. Install flags or other telltales on plugs. Remove plugs each night and screen drain.
- J. If the exterior walls are not erected at the time of membrane installation the Contractor shall envelope the flutes of the metal deck to prevent moisture intrusion and wind damage.
- K. Remove all traces of piled bulk materials and return the job site to its original condition upon completion of the work.

1.08 WARRANTY

- A. The Roofing Contractor shall furnish Shaw's with Carlisle SynTec Incorporated's 15-year written warranty covering labor and materials with no dollar limitation. The maximum wind speed coverage shall be peak gusts of 72 mph measured at 10 meters above ground level. Certification is required with bid submittal indicating the manufacturer has reviewed and agreed to such wind coverage. Such warranty shall cover defects in materials, defects in workmanship and ensure watertightness for 15 years. Warrantor shall be the manufacturer of the membrane. Warranty shall be "No Dollar Limit" (NDL). The warranty shall be written to the building Owner.
- B. Upon completion of the work and prior to acceptance of the work, the Roofing Contractor shall submit a guarantee to Shaw's and the Owner. The guarantee shall be for a 2-year period and shall cover any defect in the work or materials. The guarantee shall be submitted in a form acceptable to Shaw's. Warranty commencement shall be the same date as substantial project completion.
- C. When the warrantor (Carlisle SynTec Incorporated) is notified that there is a problem (leak or damage) with the warranted roofing system and/or accessories by telephone, and/or in writing (fax or mail) response time to physically start the repairs shall be within twenty-four (24) hours from time of telephone or date of written notification.
- D. The Contractor shall thoroughly inspect all substrates prior to the application of new materials. Upon acceptance of the substrates, the Contractor's guarantee will include the entire roof system for watertightness.

- E. All details relating to the installation of the roofing system shall be approved prior to installation by the roofing system manufacturer and installed in such a manner that the manufacturer will furnish its standard extended 72 mph warranty.

1.09 SPECIAL CONDITIONS

- A. At least 14 calendar days prior to the start of the roofing installation, an on-site conference shall be held and attended by Shaw's Representative, the Architect, the Contractor, Shaw's Insurance Underwriter and the roofing system manufacturer to review the installation requirements and procedures.
- B. All materials used in the roofing systems shall be as furnished or approved in writing by the roofing system manufacturer.
- C. Coordinate work with that of other trades affecting or affected by the work of this section. Cooperate with such trades to ensure the steady progress of all work under this contract.

1.10 INSPECTION AND TESTING

- A. Shaw's reserves the right to inspect and test all construction operations and materials.
 - 1. If the Owner or Shaw's wishes, they may request the Contractor to take test cuts in order to inspect previous work. The first six test cuts shall be paid for by the Contractor and any test cut shall not exceed 1'-6" x 1'-6".
 - 2. It shall be the responsibility of the Contractor to pay for a Shaw's selected Contractor to perform a non-destructive moisture survey (INFRA-RED) of all new roofing in place if the new roofing demonstrates any signs of leakage, regardless of cause, prior to final acceptance of work and materials by Shaw's and Designer. Remedial repair measures, if any, shall be determined by Shaw's Project Representative.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Membrane: Sure-Weld (white-on-black) .045 inch thick reinforced Molecular Bonded Polyolefin (MBP) membrane.
- B. Insulation: Specified in Section 07210.
- C. Adhesives and Cleaners: Products shall be furnished by Carlisle and specifically formulated for the intended purpose.
 - 1. Bonding Adhesive: Sure-Weld
 - 2. Edge Sealant: Cut Edge Sealant
 - 3. Sealer: Multi-Purpose Sealant
 - 4. Cleaner: Sure-Weld Membrane Cleaner
- D. Fasteners: HP-X Fastener; Threaded, black epoxy electro-deposition coated fastener; Piranha plate.
- E. Pipe Flashing: Sure-Weld pre-molded pipe flashing.

F. Walkway Pads: Carlisle Sure-Weld 30 inch wide by fifty foot long.

G. Roof Edge Strip: Carlisle SecureEdge 2000 fascia system; factory welded inside and outside corners; extruded aluminum anchor system with Kynar coated .040 aluminum cover; face width varies with roof edge condition; Bone White color.

PART 3 - EXECUTION

3.01 MEMBRANE INSTALLATION

- A. Comply with the manufacturer's published instructions and approved shop drawings for the installation of the membrane roofing system including proper substrate preparation, jobsite considerations and weather restrictions.
- B. Position sheets to accommodate contours of the roof deck and shingle splices to avoid bucking water.

3.02 MEMBRANE PLACEMENT AND ATTACHMENT

- A. Unroll and position membrane without stretching. Provide and secure both perimeter and field membrane sheets in accordance with the manufacturer's most current specifications and details.
 - 1. Provide 4 target half sheets, fastened 12 inches on center at perimeter.
- B. Secure the membrane with the required Carlisle HP-X Fasteners and Plates spaced a maximum of 12 inches on center (centered over the pre-printed marks approximately 1-1/2 inches from the edge of the membrane sheet).
- C. Install adjoining membrane sheets in the same manner in accordance with the manufacturer's specifications.
- D. Perimeter fixation shall be provided.
- E. Perimeter membrane areas left exposed prior to fascia installation shall either be fully adhered to the vertical face or retained by a continuous cleat. Membrane shall extend down wall at least 1 inch past the bottom of the wood nailer, lapping over the wall finish, but not exposed below the flashing.

3.03 MEMBRANE SPLICING/HOT AIR WELDING PROCEDURES

- A. Hot air weld the Sure-Weld membrane using an Automatic Hot Air Welding Machine or Hot Air Hand Welder in accordance with the manufacturer's specifications. At all splice intersections, roll the seam with a silicone roller prior to membrane seam cooling.
- B. Probe all seams once the hot air welds have thoroughly cooled (approximately 30 minutes).
- C. Repair all seam deficiencies the same day they are discovered.

- D. Apply Cut Edge Sealant on all cut edges of reinforced membrane (where the scrim reinforcement is exposed) after seam probing is complete.
- E. Provide 10 foot by 10 foot second layer of membrane at grease guard locations.

3.04 FLASHING

- A. Flashing of parapets, curbs, expansion joints and other parts of the roof must be performed using Sure-Weld reinforced membrane. Sure-Weld non-reinforced membrane can be used for flashing pipe penetrations, scuppers, as well as inside and outside corners when the use of pre-fabricated accessories is not feasible. Sealant pockets are not permitted.
- B. Follow manufacturer's approved shop drawing flashing details and typical procedures for all wall, curb, and penetration flashing including metal edging/coping and roof drain applications.
- C. Perimeter flashing and flashing around vents, curbs, etc., shall be done with manufacturer's flashing, using uninterrupted full height pieces.
- D. Flash all projections (pipes, conduits, curbs, refrigeration boxes, etc.) passing through the membrane.
- E. Base Flashing: The tops of elastomeric base flashing are shall be secured with a continuous aluminum termination bar and counterflashed.
- F. All vertical flashings and membranes shall be adhered to substrates regardless of height.
- G. Inside and Outside Corners: All corners shall be flashed with uncured membrane conforming to manufacturer's requirements. A minimum overlap of 3" is required.
- H. Membrane manufacturer's recommended flashing detail may be considered by the Architect when no detail is provided. Submit details to the designer prior to installation for approval.

3.05 WALKWAYS

- A. Install walkways at all traffic concentration points (such as roof hatches, access doors, rooftop ladders, etc.) and all locations as identified on the drawing. Walk rolls shall be welded at all four perimeter edges of pad.

3.06 DAILY SEAL

- A. On phased roofing, when the completion of flashing and terminations is not achieved by the end of the work day, a daily seal must be performed to temporarily close the membrane to prevent water infiltration.
- B. Complete an acceptable membrane seal in accordance with the manufacturer's requirements.

3.07 CLEAN UP

- A. Perform daily clean-up to collect all wrappings, empty containers, paper, and other debris from the project site. Upon completion, all debris must be disposed of in a legally acceptable manner.
- B. Prior to the manufacturer's inspection for warranty, the applicator must perform a pre-inspection to review all work and to verify all flashing has been completed as well as the application of all caulking.

END OF SECTION

SECTION 07600

METAL FLASHING

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Furnish and install flashing.

1.02 SHOP DRAWINGS AND PRODUCT DATA

- A. Submit Shop Drawings and product data in accordance with Section 01300.
- B. Indicate material profile and gauges, jointing details, fastening methods and spacing, and installation details.
- C. If Requested by Shaw's Representative, Submit Shop Fabricated Samples of:
 - 1. Metal expansion joints.
 - 2. Built-in metal gutters, scuppers and downspouts.
 - 3. Exposed metal trim units.
 - 4. Roof edge strip for and EPDM roofs.
 - 5. Coping.
 - 6. Termination joints and connections.
 - 7. Metal counterflashing.
- D. Submit manufacturer's data sheets and color charts for all required metal finishes.

1.03 PROTECTION

- A. Exercise care when working on or about roof surfaces to avoid damaging or puncturing membrane or flexible flashings.
- B. Place plywood panels on roof surfaces adjacent to work of this Section and on access routes. Keep in place until completion of work.

1.04 COORDINATION

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

1.05 STANDARDS

- A. Except as Modified by the Requirements of Other Governing Codes and by this Specification, Conform to the Provisions and Recommendations of the Following Codes and Standards:
 - 1. Metal installation shall be in accordance with the Architectural Sheet Metal Manual published by the Sheet Metal and Air Conditioning Contractor National Association, Inc. (SMACNA) fifth edition.
 - 2. Factory Mutual loss prevention data sheet I-49.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Flashing and Sheet Metal Materials:

1. Lead-coated Copper: ASTM B101, Type I, Class A coating on a base sheet of cold-rolled temper copper meeting ASTM B370, weighing not less than 16 oz./sq. ft., unless indicated otherwise.
2. Copper: ASTM B370, light cold-rolled temper.
3. Prefinished Metal: .040" thickness, unless indicated otherwise; aluminum; Reynolds Metals Co.; Colorweld 300 coating with Kynar 500 resin; smooth finish, color, as indicated on Drawings.
4. Fasteners: Continuous concealed clip type; of same material as flashings; sized to suit application. Nails, screws and washers; copper, bronze or stainless steel; nails, ring shank, 3/8" diameter head; stainless steel or copper.
5. Masonry flashing specified in Section 04200.

B. For attaching sheetmetal to masonry, use Rawl "Zamac" plugs, Tapcon screws by Filco Industries, Inc., or Con Fixx by Fabco; stainless steel.

C. Bituminous Coating: FS TT-C-494 or SSPC - Paint 12, solvent type bituminous mastic, nominally free of sulpher, compounded for 15-mil dry film thickness per coat.

D. Mastic Sealant: Polyisobutylene; non-hardening, non-skinning, non-drying, non-migrating sealant.

E. 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, non-corrosive, size and gauge required for performance.

F. Roofing Cement: ASTM D2822, asphaltic.

G. Solder: For use with steel or copper, provide 50-50 tin/lead solder (ASTM B32), with resin flux.

H. Flash Vent: Alcoa, Air Vent Inc., or approved equal; pre-finished aluminum; 9 sq. in. net free area per linear foot.

2.02 FABRICATION

A. Flashing Schedule

1. Two-piece Counter Flashing for Membrane Flashing at Masonry: SMACNA, Figure 4.3C (modified); turn vertical leg up 6 inches for brick veneer, make horizontal leg run back to wall sheathing; 12-inch wide L shaped back-up plates for receiver joints, 16 oz. lead-coated copper receiver; 20 oz. copper insert flashing.
2. Roof Edge Strip for MBP: Specified in Section 07530 as part of total system warranty.
3. Metal Coping: .080" pre-finished metal; shop formed to detail; joint detail SMACNA Table 3-1, J-12 Double S., edge style E1; Attachment Figure 3-7A.
4. Trim Flashing - Pre-finished Metal: shop formed to detail.

5. Overflow Scupper in Masonry: SMACNA Figure 1-26A. Lead-coated copper.
 6. Scupper at Canopy: SMACNA Figure 1-28, Section A-A; pre-finished metal downspout, Figure 1-32E.
- B. 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's instructions and recommendations. Form exposed sheet metalwork without excessive oil-canning, buckling and tool marks, true to line and levels as indicated, with exposed edges folded back to form hems.
- C. Seams: Fabricate non-moving seams in sheet metal with flat lock seams. For metal other than aluminum, tin edges to be seamed, form seams and solder. Form aluminum seams with epoxy seam sealer; rivet joints for additional strength where required.
- D. Expansion Provisions: Where lapped or bayonet-type expansion provisions in work cannot be used, or would not be sufficiently water/weatherproof, form expansion joints of intermeshing hooked flanges, not less than 1" deep, filled with mastic sealant (concealed within joints).
- E. Sealant Joints: Where movable, non-expansion type joints are indicated or required for proper performance of work, form metal to provide for proper installation of elastomeric sealant in compliance with industry standards.
- F. Separations: Provide for separation of metal from non-compatible 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

3.01 INSTALLATION

- A. Construct all metalwork neatly and securely reinforce, and stiffen as required to present and maintain true and regular surfaces. All edge strips shall be neatly folded external and internal corners shall be mitered and soldered for lead coated copper, and sealed in full bed of water cut off mastic for pre-finished metal. Install work with permanently watertight and weatherproof joints, laps and seams. Conceal all fasteners. Provide for thermal expansion of metal.
- B. Metal edgestrips shall be set on roofing membrane. Bottom edge shall be secured with a continuous concealed clip. No face nailing allowed. Nail the top flange with annular-threaded nails three inches (3") o.c. and strip with flashing.
- C. Where back-up plates are specified, set flashing ends in full bed of water cut-off mastic, allowing 1/4 inch between sections.

- D. Where stacks or vents pass through roof, install preformed factory pipe seals around pipes embedded into roof. Flash into roofing with elastomeric flashing.
- E. Provide metal counter flashing where elastomeric base flashing is used. Flashing shall be built-in and turned up to provide positive weather protection.
- F. Lap counterflashing over vertical leg of base flashing 4 inches minimum.
- G. Electrolytic Action: Where two (2) dissimilar metals adjoin or lap each other (example: galvanized metal ducts and copper cap flashing), an approved separating strip or other insulating material shall be installed.
- H. All exposed sheet metalwork shall be cleaned at completion of installation. All exposed metal surfaces shall be free of dents, creases, waves, scratch marks and solder or weld marks.

END OF SECTION

SECTION 07900

SEALANTS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Sealing of control joints in exterior and interior masonry work and joints between masonry and metalwork and cementitious materials and at angle guards at sills.
- B. Sealing of exterior joints between perimeters of window frames, door frames, and other items occurring in openings in exterior walls, and the surrounding masonry construction, including bed sealing of thresholds.
- C. Caulking of interior perimeter joints around window frames, door frames, counter backsplash and at Owner furnished sinks, floor angles at wall behind grout, pit covers, wood trim, penetrations through walls, and other items occurring in openings in exterior or interior walls or joints.
- D. All other exterior sealing and interior caulking called for, and as required to provide tight conditions in walls and partitions.

1.02 REFERENCES

- A. ASTM C 920-79: Elastomeric Joint Sealants.
- B. F.S. TT-S-8227E: Sealing Compound, Elastomeric Type, Multi-Component (for Caulking, Sealing and Glazing in Building Construction).
- C. F.S. TT-S-00230C: Sealing Compound, Elastomeric Type, Single Component (For Caulking, Sealing and Glazing in Buildings and Other Structures)

1.03 SUBMITTALS

- A. Submittals shall be in accordance with Section 01300.
- B. Submit manufacturer's descriptive literature, color samples, technical samples and data sheets on each type of caulking and sealant material proposed.
- C. Submit manufacturer's material safety data sheets (MSDS) for all system products to be utilized for record.

1.04 QUALITY CONTROL

- A. All caulking and sealant installation shall be installed by a specialty Subcontractor proficient in this trade and approved by Shaw's. Samples of workmanship shall be provided for review and approval.

1.05 DELIVERY AND HANDLING

- A. Sealants shall be delivered to the job site in sealed containers bearing the manufacturer's name; mixed, stored, handled and applied in strict accordance with manufacturer's detailed instruction, copies of which shall be submitted with samples for approval and made available to the Designer and Shaw's Project Representative at all times on the job site.

1.06 MATERIAL LIFE

- A. Manufacturer's label shall indicate date of manufacture of sealants, or manufacturer shall otherwise attest to date of manufacture. Period of time no longer than 6 months for polyurethane shall have elapsed from date of manufacture to date of usage on job.

PART 2 - PRODUCTS

2.01 SEALANT MATERIALS

- A. General Sealant: Low modulus, one component, moisture cured, non-sag, permanently flexible polyurethane sealant with 100 to 50 percent movement capabilities. Conforms to Fed. Spec. TT-S-00230C, Type II, Class A, ASTM C-920, Type S, Class 25, Grade NS, Sika Sikaflex 1a, Sonneborn NP-1, Tremco Dymonic, or approved equal.
 - 1. Custom colored sealant shall be equal to Tremco Dymeric, or Sonneborn NP-2. Provide custom colored sealants at exterior to match adjacent masonry and exterior insulated finish system.
- B. Silicone Sealant: (At Kitchen, Ceramic Tile, Toilet Areas, Fiberglass Reinforced Panels, Counter Backsplashes and Refrigeration Line Penetrations Through Metal Plate Pit Covers): 1-component mildew resistant white silicone sealant similar and approved equal to Dow Corning 786 Sealant, General Electric Silicone Sanitary 1702 Sealant, Rhodorsil 3B, or approved equal.
- C. Acrylic Latex Sealant: (At Interior Painted Joints, Joints at Mirrors): Tremco acrylic latex, or approved equal.
- D. Seam Sealant (At Small Metal to Metal Joints): Tremco Seam Sealer, or approved equal.
- E. Sidewalk Joint Sealant: Self-leveling; Tremco THC 900 or Thiokol T-2407.

2.02 ACCESSORIES

- A. Backer Rod Material: Closed cell polyethylene foam, or butyl and neoprene rods. Do not use an asphalt treated packing material.
- B. Primer: As recommended by sealant manufacturer.
- C. Bond Breaker Tape: Polyethylene tape as recommended by sealant manufacturer.

PART 3 - EXECUTION

3.01 WORKMANSHIP

- A. Joints and spaces to be sealed shall be clean, dry and free of dust, loose mortar, and other foreign matter. Clean ferrous metal of all rust, mill scale and coatings by wire brush, grinding or sandblasting. Remove oils and grease with solvent, such as xylol, toluol, or methyl-ethyl-ketone. Remove protective coatings from aluminum surfaces against which caulking materials are to be placed.
- B. Pack all recesses or joints to be caulked to within 1/2" of surface with one of the specified packing materials. Joints to be caulked shall not be over 1" wide or less than 1/4". Depth of sealant shall equal joint width up to 1/2" wide; depth of sealant shall equal 1/2 width of joint for joints over 1/2" wide. Use bond breaker tape in masonry control joints that have been raked.
- C. Mask exposed surfaces on both sides of joints to prevent contact with sealant.
- D. Immediately prior to caulking with sealant, prime both sides of joint.
- E. After joints have been completely filled, neatly tool the joint.
- F. Immediately clean adjacent materials which have been soiled; leave work in a neat, clean condition.
- G. Place no sealant when the temperature is below 40°F.
- H. No sealant shall be left feather-edged out onto adjacent surfaces.
- I. Cure sealants and caulking compounds in compliance with manufacturer's instructions and recommendations, to obtain high early bond strength, internal cohesive strength and surface durability. Protect joint sealers during construction period to prevent damage or deterioration.
- J. Bond Breaker Tape: Shall be applied to sealant-contact surfaces where bond to substrate or joint filler must be avoided for proper performance of sealant. Provide self-adhesive tape where applicable.

3.02 GUARANTEE

- A. Provide written guarantee, on approved format, guaranteeing all sealant work against defective material and workmanship for a period of 5 years, commencing on the date of substantial completion of the building.

END OF SECTION

SECTION 08100

STEEL DOORS AND FRAMES

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Furnish and install metal doors and frames.

1.02 SUBMITTALS

- A. Submit each item in this Article according to Section 01300.
- B. Product Data for each type of door and frame specified, including details of construction, materials, dimensions, hardware preparation, core, label compliance, profiles, and finishes.
- C. Shop Drawings showing fabrication and installation of steel doors and frames. Include details of each frame type, elevations of door design types, conditions at openings, details of construction, location and installation requirements of door and frame hardware and reinforcements, and details of joints and connections. Show anchorage and accessory items.
- D. Door Schedule: Submit schedule of doors and frames using same reference numbers for details and openings as those on Contract Drawings.
 - 1. Indicate coordination of glazing frames and stops with glass and glazing requirements.

1.03 QUALITY ASSURANCE

- A. Provide doors and frames complying with ANSI/SDI 100 "Recommended Specifications for Standard Steel Doors and Frames" and as specified.
- B. Fire-Rated Door Assemblies: Units that comply with NFPA 80, are identical to door and frame assemblies tested for fire-test-response characteristics per ASTM E 152, and are labeled and listed by UL or Warnock Hersey.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Deliver doors and frames cardboard-wrapped or crated to provide protection during transit and job storage. Provide additional protection to prevent damage to finish of factory-finished doors and frames.
- B. Inspect doors and frames on delivery for damage. Minor damages may be repaired provided refinished items match new work and are acceptable to Architect; otherwise, remove and replace damaged items as directed.
- C. Store doors and frames at building site under cover. Place units on minimum 4-inch high wood blocking. Avoid using non-vented plastic or canvas shelters that could create a humidity chamber. If cardboard wrappers on doors become wet, remove cartons immediately. Provide

minimum 1/4-inch spaces between stacked doors to promote air circulation.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include:
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Steel Doors and Frames:
 - a. Ceco Door Products.
 - b. Curries Co.
 - c. Steelcraft.

2.02 MATERIALS

- A. Hot-Rolled Steel Sheets and Strip: Commercial-quality carbon steel, pickled and oiled, complying with ASTM A 569.
- B. Cold-Rolled Steel Sheets: Carbon steel complying with ASTM A 366, commercial quality, or ASTM A 620, drawing quality, special killed.
- C. Galvanized Steel Sheets: Zinc-coated carbon steel complying with ASTM A 526, commercial quality, or ASTM A 642, drawing quality, hot-dip galvanized according to ASTM A 525, with A 60 or G 60 coating designation, mill phosphatized.
- D. Supports and Anchors: Fabricated from not less than 0.0478-inch thick steel sheet; 0.0516-inch thick galvanized steel where used with galvanized steel frames.
- E. Inserts, Bolts, and Fasteners: Manufacturer's standard units. Where items are to be built into exterior walls, hot-dip galvanize complying with ASTM A 153, Class C or D as applicable.

2.03 DOORS

- A. Steel Doors: Provide 1-3/4-inch thick doors of materials and ANSI/SDI 100 grades and models specified below, or as indicated on Drawings and schedules:
 - 1. Interior Doors: Grade II, heavy-duty, Model 1, full flush design, minimum 0.0478-inch thick cold-rolled steel sheet faces (18 ga.).
 - 2. Exterior Doors: Grade III, extra heavy-duty, Model 1, full flush design, minimum 0.0635-inch thick galvanized steel sheet faces (16 ga.).

2.04 FRAMES

- A. Provide metal frames for doors, transoms, sidelights, borrowed lights, and other openings, according to ANSI/SDI 100, and of types and styles as shown on Drawings and schedules. Conceal fastenings, unless otherwise indicated. Fabricate frames of minimum 0.0598-inch thick (16 ga.) cold-rolled steel sheet, except as specified below:
 - 1. Fabricate frames with mitered or coped and continuously welded corners.
 - 2. Fabricate frames for interior openings over 60 inches wide from 0.0747-inch thick (14 ga.) steel sheet.
 - 3. Form exterior frames from 0.0785-inch thick 14 ga. galvanized steel sheet.
- B. Door Silencers: Drill stops to receive 3 silencers on strike jambs of single-door frames and 2 silencers on heads of double-door frames, including weatherstripped frames.
- C. Grout: When required in masonry construction, as specified in Division 4 Section "Unit Masonry."

2.05 FABRICATION

- A. Fabricate steel door and frame units to be rigid, neat in appearance, and free from defects, warp, or buckle. Where practical, fit and assemble units in manufacturer's plant. Clearly identify work that cannot be permanently factory assembled before shipment, to assure proper assembly at Project site. Comply with ANSI/SDI 100 requirements.
 - 1. Internal Construction: One of the following manufacturer's standard core materials according to SDI standards:
 - a. Resin-impregnated paper honeycomb.
 - b. Rigid polyurethane conforming to ASTM C 591.
 - c. Rigid polystyrene conforming to ASTM C 578.
 - d. Unitized steel grid.
 - e. Vertical steel stiffeners.
 - f. Rigid mineral fiber with internal sound deadener on inside of face sheets.
 - 2. Clearances: Not more than 1/8 inch at jambs and heads, except not more than 1/4 inch between non-fire-rated pairs of doors. Not more than 3/4 inch at bottom.
 - a. Fire Doors: Provide clearances according to NFPA 80.
- 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. Bevels: Lock edge shall be beveled 1/8 inch in 2 inches.
- E. Fabricate concealed stiffeners, reinforcement, edge channels, louvers, and moldings from either cold- or hot-rolled steel sheet.

- F. Galvanized Steel Doors, Panels, and Frames: For the following locations, fabricate doors, panels, and frames from galvanized steel sheet according to SDI 112. Close top and bottom edges of doors flush as an integral part of door construction or by addition of minimum 0.0635-inch thick galvanized steel channels, with channel webs placed even with top and bottom edges. Seal joints in top edges of doors against water penetration.
1. At exterior locations.
- G. Exposed Fasteners: Unless otherwise indicated, provide countersunk flat or oval heads for exposed screws and bolts.
- H. Thermal-Rated (Insulating) Assemblies: At exterior locations and elsewhere as shown or scheduled, provide doors fabricated as thermal-insulating door and frame assemblies and tested according to ASTM C 236 or ASTM C 976 on fully operable door assemblies.
1. Unless otherwise indicated, provide thermal-rated assemblies with U-value rating of 0.13 Btu/sq. ft. x h x deg F or better.
- I. Hardware Preparation: Prepare doors and frames to receive mortised and concealed hardware according to final door hardware schedule and templates provided by hardware supplier. Comply with applicable requirements of SDI 107 and ANSI A115 Series specifications for door and frame preparation for hardware.
- J. Reinforce doors and frames to receive surface-applied hardware. Drilling and tapping for surface-applied hardware may be done at Project site.
- K. Locate hardware as indicated on Shop Drawings or, if not indicated, according to the Door and Hardware Institute's (DHI) "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
- L. Glazing Stops: Minimum 0.0359-inch thick steel.
1. Provide nonremovable 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.

2.06 FINISHES, GENERAL

- A. Comply with NAAMM's "Metal Finishes Manual" for recommendations relative to applying and designating finishes.
- B. Comply with SSPC-PA 1, "Paint Application Specification No. 1," for steel sheet finishes.
- C. Apply primers and organic finishes to doors and frames after fabrication.

2.07 GALVANIZED STEEL SHEET FINISHES

- A. Surface Preparation: Clean surfaces with nonpetroleum solvent so that surfaces are free of oil or other contaminants. After cleaning, apply a conversion coating of the type suited to the organic coating applied

over it. Clean welds, mechanical connections, and abraded areas, and apply galvanizing repair paint specified below to comply with ASTM A 780.

1. Galvanizing Repair Paint: High-zinc-dust-content paint for regalvanizing welds in galvanized steel, with dry film containing not less than 94 percent zinc dust by weight, and complying with DOD-P-21035 or SSPC-Paint 20.

B. Factory Priming for Field-Painted Finish: Where field painting after installation is indicated, apply air-dried primer specified below immediately after cleaning and pretreatment.

1. Shop Primer: Zinc-dust, zinc-oxide primer paint complying with performance requirements of FS TT-P-641, Type II.

2.08 STEEL SHEET FINISHES

A. Surface Preparation: Solvent-clean surfaces to comply with SSPC-SP 1 to remove dirt, oil, grease, and other contaminants that could impair paint bond. Remove mill scale and rust, if present, from uncoated steel to comply with SSPC-SP 5 (White Metal Blast Cleaning) or SSPC-SP 8 (Pickling).

B. Pretreatment: Immediately after surface preparation, apply a conversion coating of type suited to organic coating applied over it.

C. Factory Priming for Field-Painted Finish: Apply shop primer that complies with ANSI A224.1 acceptance criteria, is compatible with finish paint systems indicated, and has capability to provide a sound foundation for field-applied topcoats. Apply primer immediately after surface preparation and pretreatment.

PART 3 - EXECUTION

3.01 INSTALLATION

A. General: Install steel doors, frames, and accessories according to Shop Drawings, manufacturer's data, and as specified.

B. Placing Frames: Comply with provisions of SDI 105, unless otherwise indicated. Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is completed, remove temporary braces and spreaders, leaving surfaces smooth and undamaged.

1. Except for frames located in existing concrete, masonry, or gypsum board assembly construction, place frames before constructing enclosing walls and ceilings.

2. In masonry construction, install at least 3 wall anchors per jamb adjacent to hinge location on hinge jamb and at corresponding heights on strike jamb. Acceptable anchors are masonry T-shaped anchors.

3. At existing concrete or masonry construction, install at least 3 completed opening anchors per jamb adjacent to hinge location on hinge jamb and at corresponding heights on strike jamb. Set frames and secure to adjacent construction with bolts and masonry anchorage devices.

4. In metal-stud partitions, install at least 3 wall anchors per jamb at hinge and strike levels. In steel-stud partitions, attach wall anchors to studs with screws.
 5. In in-place gypsum board partitions (remodels only), install knock-down, slip-on, drywall frames.
 6. Install fire-rated frames according to NFPA 80.
- C. Door Installation: Fit hollow-metal doors accurately in frames, within clearances specified in ANSI/SDI 100.
1. Fire-Rated Doors: Install with clearances specified in NFPA 80.

3.02 ADJUSTING AND CLEANING

- A. Prime Coat Touchup: Immediately after erection, sand smooth any rusted or damaged areas of prime coat and apply touchup of compatible air-drying primer.
- B. Protection Removal: Immediately before final inspection, remove protective wrappings from doors and frames.

END OF SECTION

SECTION 08200

WOOD DOORS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Furnish and install wood doors and related items.

1.02 RELATED WORK

- A. Section 08100: Steel Doors and Frames.
- B. Section 08710: Finish Hardware.
- C. Section 08800: Glazing.
- D. Section 09900: Painting.

1.03 SUBMITTALS

- A. Submit Shop Drawings and product data showing construction of doors, finish, fire rating and schedule of door types and locations.
- B. Submit a sample section for each type of door specified, at the Architect's request.
- C. Submit Shop Drawings and product data in accordance with Section 01300.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Wood doors shall be solid core flush type manufactured by Blount, Chappel, Mohawk, Lambton or approved equal. Doors shall be 1-3/4" thick.
 - 1. Doors shall be framed particleboard construction. Particle board to have a 30#/cu. ft. density. Provide mineral core for rated construction.
 - 2. 7-ply or 9-ply construction; Type II adhesive.
 - 3. Stiles, Rails and Blocking:
 - a. Stiles: 1-inch minimum thickness; hardwood.
 - b. Rails: Softwood; 1-1/8 inch top rail; 2-1/4 inch bottom rail.
 - c. Blocking: Provide internal blocking required for door hardware.
 - 4. Face veneers shall be rotary cut natural birch, .03 minimum thickness.
 - 5. The top and bottom rails of the door shall be sealed with an approved wood preservative to prevent mildew, decay and fungus growth.
 - 6. Provide written 5 year guarantee.
 - 7. All glazing stops shall be metal.

8. Louvers shall be Chevron type, manufactured of birch to match door.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Install doors plumb and square in strict accordance with manufacturer's instructions, Shop Drawings and door schedule. Maximum diagonal distortion shall not exceed 1/16 inch.
- B. Install doors with not more than 1/8" clearance at top and sides, 1/4" at bottom except where required to be undercut to meet HVAC requirements.

END OF SECTION

SECTION 08410

ALUMINUM ENTRANCES AND STORE FRONT

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Furnish and install, complete, aluminum frames and related items as shown and herein specified.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 07900: Sealants.
- B. Section 08800: Glazing.
- C. Refer to architectural drawings for specific interior decor material finish selections. These selections shall be furnished exactly as indicated with no substitution allowed.

1.03 SUBMITTALS

- A. Submit Shop Drawings in accordance with Section 01300 showing details of materials, reinforcing, connections, fasteners to rough opening, and all layouts.

1.04 PROTECTION AND CLEANING

- A. Protect all aluminum surfaces against damage at all times, store off the ground, under cover and in a dry place. After erection, they shall be adequately protected against staining, smearing and damage during construction and finishing operations.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Aluminum storefront and framing materials shall be Kawneer 451T Thermal Framing and 451 non-thermally broken framing or Vista Wall Thermal Slot 3000 and 3000S non-thermally broken framing.

2.02 MATERIALS

A. Framing System:

- 1. Exterior Frames: Thermal-break construction, extruded aluminum 6063-T5; wind loading 35 psf. Clear anodic coating AA-M12C22A31 Class II mechanical finish, non-specular, with medium-matte chemical etch, minimum thickness 0.4 mil (0.010mm). Provide internal horizontal and vertical reinforcement indicated and any additional support required by the manufacturer of the framing system. All framing faces shall be seamless with neoprene glazing gaskets.

- a. Use thermal break construction at interior for Meat Prep Room with insulating glass.
 2. Interior Frames: Extruded aluminum 6063-T5; paint finish with Kynar 500 resin; all framing faces shall be seamless with neoprene glazing gaskets.
- B. Doors: Manufacturer's standard narrow style door, with offset pivot hinges, surface mounted closer, push bar/plate and pull handle to match existing hardware on adjacent retail spaces, threshold, weatherstripping and deadbolt latching.
- C. Hardware Preparation: All cutouts, recesses, mortising or milling operations required for hardware shall be accurately made and reinforced with backing plates, as required to insure adequate strength of the connection.
- D. Fasteners: All fasteners shall be aluminum or stainless steel. Exposed fasteners shall match frame and door finish.
- E. Aluminum Breakmetal: .060" thick; custom color Kynar finish to match storefront framing for aluminum sill and bent covers. All fasteners shall be concealed. Sill shall have continuous clip.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Install all work in its proper position on the structure, level, plumb, straight and square at the correct elevation and plane and in alignment with the adjacent construction.
- B. Aluminum in contact with dissimilar metals shall have contact surfaces painted with zinc-chromate paint or other approved separator.
- C. Exterior installation shall be weathertight.

END OF SECTION

SECTION 08710

FINISH HARDWARE

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Furnish all labor and materials to complete finish hardware as specified herein.

1.02 RELATED WORK

- A. Section 08100: Steel Doors and Frames.
- B. Section 08200: Wood Doors.
- C. Section 08410: Aluminum Entrances and Storefronts.

1.03 SUBMITTALS

- A. Submit product literature and a complete and detailed finish hardware schedule in typewritten form.
- B. If the hardware for any particular location is not described herein, supply hardware of equivalent quality and quantity as that which is specified for comparable opening.
- C. Submit product literature and schedule in accordance with Section 01300.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Hinges: Shall be full mortise type manufactured by Stanley, or approved equal. Provide US26D finish.

- Exterior Door - FBB191 4-1/2 x 4-1/2 with non-removable pins
 - Interior Doors with closers - FBB179 4-1/2 x 4-1/2
 - Interior Doors without closers - 179 4-1/2 x 4-1/2
 - Interior Door spring hinge - 20260 4-1/2 x 4-1/2

- B. Double Acting Hinges: Bommer Type 3024, US26D.
- C. Locksets: Shall be Best 9K Series, or approved equal by Arrow or Falcon with removable cores interchangeable to receive Best 6-pin locks. Provide 15C design trim with 26D finish. Construction cores and keys by the Contractor. Permanent cores and keying by Shaw's.
- D. Closers: Interior closers shall be LCN Model 1070 with back-check, or approved equal. Use LCN4110 Series with Cush-N-Stop and hold open arms at exterior doors.

- E. Push Plates: 16 gauge stainless steel, 15% nickel minimum. Size: 3-1/2" x 14" push plate.
- F. Door Stops: Shall be Ives No. 406, 26D, or approved equal, for wall stops; Ives No. 448, or approved equal, for floor stops.
- G. Exit Device: Sargent 2800 Series or Precision Hardware Inc. Apex Series; rim type device; cylinder dogging; paint finish.
- H. Weatherstripping:
 - 1. Head and jambs shall be protected with Zero #98 surface mounted seals, or equal. Zero #312 for Door 123A.
 - 2. Sills shall be protected with Zero #96A surface seals. National Guard FS600A UL classified for Doors 123A-215.
 - 3. Meeting stiles shall be protected with Zero #98M seal, or equal.
- I. Surface Bolts: Slide bolts shall be manufactured by Pettingill-Ross Co. Inc., (207-854-9766) to receive Owner's padlocks.
- J. Deadlocks: Shall be Adams Rite MS1850A. Cylinder manufacturer shall match locksets.
- K. Silencers: Ives No. 20, or equal.
- L. Thresholds: 1/2" high beveled aluminum attached with 3/8" countersunk flat expansion screws at 8" o.c. Set level in bed of sealant.
- M. Cylinders: Best Lock Corp., 1 E Series; 6 pin core; 626 finish.
- N. Deadlatch: Adams Rite 4720 ANSI; bolt hold-back; 4160 lever; strike plate with dust box.

2.02 HARDWARE SETS

Hardware Set #1 (101)

Each door shall have:

- 1 Deadlock - key outside, thumb turn inside

Hardware Set #2 (102, 102A, 104, 104A)

Each door shall have:

- 3 Hinges
- 1 Lock Set Function N
- 1 Wall Stop

Hardware Set #3 (103)

Each door shall have:

- 3 Double acting hinges
- 1 Push plate each side.

Hardware Set #4 (103A)

Each door shall have:

- 3 Hinges
- 1 Lockset Function D (active leaf)
- 1 Closer
- 2 Slide Bolts (inactive leaf)
- 1 Weatherstrip
- 1 Threshold

Hardware Set #5 (105)

- 3 Hinges
- 1 Lockset Function L
- 1 Wall Stop

Hardware Set #6 (106)

- 3 Hinges
- 1 Lockset Function D
- 1 Closer
- 1 Weatherstrip
- 1 Threshold

2.03 KEYING

- A. Construction cores, keys and keying by Contractor. Permanent cores, keys and keying by Shaw's.
- B. Temporary padlocks by Contractor. Permanent padlocks by Shaw's.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Install all hardware in accordance with manufacturer's recommendations and instructions.
- B. Install door silencers on all metal frames.

END OF SECTION

SECTION 08800

GLAZING

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Furnish and install, complete, all glass and glazing.

1.02 STORAGE AND HANDLING

- A. Material shall be delivered when and as required and stored in a safe location. Material shall not be unpacked until it is to be used. All glass shall be factory-labeled on each pane and labels shall remain on glass until final cleaning.

1.03 SUBMITTALS

- A. Submit Shop Drawings in accordance with Section 01300 showing material type and location.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Tempered Glass: 1/4" thick heat tempered glass; ASTM C-1048.
- B. Plate Glass: 1/4" thick clear plate glass; ASTM C-1036.
- C. Insulating Glass Units: Shall be manufactured by Solar Seal Co., or approved equal, consisting of 2 lites of glass separated by a spacer filled with moisture absorbing desiccant. Units shall have clear glass for outboard lite and clear for interior lite with Low-E coating on #3 surface. Units shall be two-part hermetically sealed, having a primary butyl rubber sealant, and a secondary polysulfide sealant, with fused or welded corners, with 10-year warranty against seal failure.
 - 1. Lites for tempered insulating glass units shall be 1/4" tempered glass with 1/2" spacers for a total composite thickness of 1".
 - 2. Lites for all other insulating glass units shall be 1/4" plate glass with 1/2" spacers.
- D. All units shall be certified to Class CBA of ASTM E-6 P3 test requirements through IGCC and have the IGCC label and A Classification permanently etched in the corner of the insulating glass units.
- E. Glazing Compound: Compound shall be high quality, non-hardening sealant, polysulfide or silicone for exterior work. Shall be compatible with insulating glass.

PART 3 - EXECUTION

3.01 SETTING

- A. Glass shall be set in strict accordance with manufacturer's specifications and the following.
- B. Units shall be set with proper clearance on two 70 durometer setting blocks at 1/4 points, with units centered in opening.
- C. Glass shall be accurately cut and set true to line, plumb and level in a manner to prevent strain on the glass.
- D. Glass not installed in dry gasket system shall be back bedded. Stops shall be removed while glass is being set and shall be set in sealant.
- E. All glass which after being cleaned shows cracks, or breakage, or defects that were present when delivered at the building or that are a result of improper glazing, except mill-glazed items, shall be removed and replaced with new and perfect glass.
- F. All glass must be set in such a manner as to avoid liability of breakage. Items of breakage, due to workmen of other trades, must be adjusted with the General Contractor, but all glass whatever, including mill-glazed items, must be left complete and perfect on completion of this Contract.

3.02 CLEANING

- A. Clean glass surfaces promptly after installation. Remove excess glazing and sealing compounds, mortar, paint, dirt, and other contaminants. Install 48" wide paper over all windows on interior side as soon as initial cleaning is done.
- B. Remove paper and final wash all glass (inside and outside) no more than 48 hours prior to turnover to Shaw's. Remove and replace scratched or damaged materials after final cleaning, then clean all replacements.

END OF SECTION

SECTION 09250

GYPSUM WALLBOARD

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Materials and labor required to complete gypsum wallboard construction and interior metal framing.
- B. Exterior sheathing.

1.02 RELATED SECTIONS

- A. Section 05410: Light Gauge Structural Steel Framing.
- B. Section 06100: Carpentry.
- C. Section 07200: Building Insulation.
- D. Section 09900: Painting.

1.03 SUBMITTALS

- A. Submittals shall be in accordance with Section 01300.
- B. Submit manufacturer's product data for products specified.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in their original unopened packages and store in an enclosed shelter providing protection from damage and exposure to the elements.
- B. Remove damaged or deteriorated materials from the premises.

1.05 ENVIRONMENTAL REQUIREMENTS

- A. In cold weather and during gypsum board application and joint finishing, temperatures within the building shall be maintained within the 55°F to 70°F range.
- B. Provide adequate ventilation to carry off excess moisture.
- C. Gypsum sheathing shall not be left exposed to the weather for longer than manufacturer's recommendations. Submit manufacturer's written requirements for protection.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Metal Framing Materials: Dale/Incor, Marino, Dietrich, or Unimast.

B. Gypsum Products: Domtar, U.S. Gypsum Co., or Gold Bond.

C. Caulking Materials: Tremco, DAP, or Pecora.

2.02 GYPSUM WALLBOARD

A. Gypsum Board: ASTM C 36, Type Regular (Type X for rated ceilings), 48 inches wide x maximum permissible lengths with long edges tapered. Boards shall be 1/2 inch thick unless indicated otherwise.

B. Moisture-Resistant Gypsum Board: ASTM C 630, Type X, water-resistant core, 48 inches wide x maximum permissible lengths with long edges tapered. Boards shall be 1/2 inch thick unless indicated otherwise.

C. Gypsum Sheathing: ASTM C 79, Georgia Pacific Dens-Glass Firestop, Type X, 1/2 inch thick x 48 inches wide; maximum permissible length; fiberglass mat surface on both sides.

2.03 GYPSUM WALLBOARD ACCESSORIES

A. Corner Bead: 1-1/4 inch x 1-1/4 inch galvanized steel external corner with 1/8 inch nose bead.

B. Casing Bead: 30 gauge galvanized steel channel-type casing with 1/16 inch nose bead ground and knurled flange for joint compound finishing.

C. Fasteners:

1. For Metal Supporting Members: ASTM 646, Type S bugle head screws.
2. For Wood Supporting Members: ASTM 646, Type W bugle head screws.

D. Joint Reinforcing Tape: Same manufacturer as the gypsum wall-board, or approved by the manufacturer of the gypsum wallboard.

E. Joint Cement: Bedding cement and finishing cement shall be of the same manufacturer as the reinforcing tape.

F. Water shall be clean, free from oil or alkali and suitable for domestic consumption.

G. Caulking: Synthetic rubber based acoustical sealant.

H. Control Joint: Roll-formed zinc control joint with 3/32 inch grounds and 1/4 inch wide x 7/16 inch deep V-groove.

2.04 METAL FRAMING

A. Steel Studs (Non-Load Bearing Partitions and Soffits): ASTM C645; electro-galvanized finish; runners with 1-1/4 inch minimum leg height and minimum 20 gauge, except provide deep track 16 gauge with 2-3/4 inch leg height at locations indicated. All double studs at door jambs shall be 20 gauge.

1. 3-5/8" studs for spans 12'-0" and less - 25 gauge.
2. 3-5/8" studs for spans greater than 12'-0" - 20 gauge.
3. 6" studs - 20 gauge - use for all locations over 16'-0" high and locations indicated.
4. Maximum allowable deflection L/240 with 5 psf lateral load.

- B. Z Furring Channel: 26 gauge, galvanized steel Z-shaped furring channel.

PART 3 - EXECUTION

3.01 ERECTION OF STEEL STUDS

- A. Runners shall be aligned accurately at floor and ceiling and securely anchored with suitable fasteners spaced not more than 16" apart. Ceiling channel shall not be fastened to studs to allow a slip joint.
- B. Studs shall be positioned vertically in the runners spaced no greater than 16" o.c. Studs shall be cut 3/4" short to allow for structure deflection. Anchor all studs to floor runner flanges by positive screw engagement, by welding or by clips through each stud flange and runner flange. When necessary, studs shall be securely spliced with a minimum 12" nested lap in which one screw per stud flange is required. Provide full height double studs at all door openings. Next stud at doors shall be located no more than 6" from double studs.
- C. Studs shall be located no more than 2" from all door frame jambs, abutting partitions, partition corners and other construction. Studs shall be securely anchored to the jamb and head anchor clips of each door or borrow light frame by bolt or screw attachment. Over openings, a cut-to-length section of runner track with a web flange bend at each end shall be placed horizontally and securely screw-attached to the adjacent vertical studs. A cut-to-length stud shall be positioned at the location of vertical joints over the door frame header extending to the ceiling runner.
- D. Provide horizontal stiffeners, spaced not more than 6'-0" on center.
- E. Reinforce separate rows of studs at pipe chases with channels or studs between the two stud lines, or other equivalent means.
- F. All metal furring attached to walls and ceilings shall be spaced no greater than 16" o.c. unless indicated otherwise.

3.02 INSTALLATION OF BOARDS

- A. Preparation for Work: Examine and inspect materials to which gypsum board is to be applied. Remedy all defects prior to installation of drywall. Defects in the finish installation due to misaligned framing or other cause will be the responsibility of the work performed under this Section. Starting of work shall imply the acceptance of the conditions. Application and finishing of gypsum board shall comply with the Gypsum Association GA-216, except as otherwise specified.
- B. Cutting Wallboard: Cut gypsum wallboard by scoring and breaking, or by sawing, working from the face side. Where board meets projecting surfaces, scribe board neatly.
- C. Placing Wallboard:
 - 1. Place boards vertically into contact with each other, but do not force into place. Maximum allowable gap at end joints is 1/4". Butt to butt joints are prohibited.

2. Neatly fit and stagger end joints.
 3. Make joint layout at openings so that no end joints will align with edges of opening.
 4. Hold boards up off floor to prevent wicking of water on floors. Gap shall be 1/2" maximum where vinyl base occurs.
 5. Screw fasten gypsum board a maximum of 12" o.c. in field of board and 12" along abutting ends or edges.
 6. Power-drive screws at least 3/8" from edges or ends of gypsum boards to provide uniform dimple 1/32" deep.
 7. Erect exterior gypsum sheathing horizontally, with edges butted tight and ends occurring over firm bearing.
 8. Install tile backer board with galvanized fasteners and tape in strict accordance with manufacturer's written instructions.
 9. Low air return partitions shall be sealed air-tight from below case to the return air duct above finished ceiling.
- D. Joint System: Finish all face panel joints and internal angles with joint reinforcing tape and joint cement in accordance with the manufacturer's directions. Spot exposed fasteners on face layers and finish corner bead, control joints and trim as required, with at least three coats of joint compound, feathered out onto faces and sand smooth.
- E. Where partition or ceiling terminates against masonry, windows or other dissimilar material, apply casing bead over gypsum board edge and fasten with nails or galvanized staples 9" o.c.
- F. Caulking:
1. At exterior walls, bed the floor and ceiling track that abuts concrete and ceiling and first stud that abuts concrete or masonry in a good beading of dry-wall sealant.
 2. At acoustically insulated partitions caulk around perimeters of boards where they abut any dissimilar materials, including floors, completely filling joints.
 3. Caulk around ducts, pipes, outlets, and any other openings in these partitions.
 4. Treat cut edges and holes with sealant where moisture may damage gypsum board.

END OF SECTION

SECTION 09500

ACOUSTICAL TREATMENT

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. All materials and labor required to complete all acoustical ceiling and grid systems.

1.02 RELATED WORK

- A. Section 07475: Metal Soffits.

1.03 SUBMITTALS

- A. Submit samples and manufacturer's descriptive literature for all products specified.
- B. Submit reflected ceiling plans for all acoustical ceilings showing locations of light fixtures, diffusers and grilles.
- C. Submit Shop Drawings, samples and product data in accordance with Section 01300.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. All materials shall be delivered in their original unopened packages and stored in an enclosed shelter providing protection from damage and exposure to the elements.
- B. Damaged or deteriorated materials shall be removed from the premises.

1.05 ENVIRONMENTAL CONDITIONS

- A. Examine all surfaces and conditions affecting the proper installation of the materials, and do not proceed until all unsatisfactory conditions have been corrected. Starting of work shall imply acceptance of the conditions.
- B. No acoustical units shall be installed until building has been completely closed-in and relative humidity shall not exceed 60% with a minimum temperature of 60°F before, during and after installation.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Acoustical lay-in ceiling board shall be manufactured by Armstrong, or United States Gypsum.
- B. Suspension system shall be manufactured by Chicago Metallic Corp., Donn Corporation, or Armstrong.

2.02 ACOUSTICAL LAY-IN PANELS

- A. Acoustic Boards: Type 1.
 - 1. Size: 24 inches x 48 inches x 5/8 inch thick.
 - 2. Composition: Mineral wool fiber.
 - 3. Surface Finish: Vinyl paint; white.
 - 4. Surface Texture: Fissured.
 - 5. Edge: Square.
 - 6. NRC Range: .50-.60.
 - 7. STC Range: 35-39.
 - 8. Fire Hazard Classification: Class A, 0-25 flame spread.
 - 9. Manufactured Name: USG fissured, Armstrong Cortega #769.

2.03 SUSPENSION SYSTEMS

- A. Lay-In Suspension System: Electro-galvanized cold rolled steel with factory-applied flat white finish (equal to Donn #50) 1-1/2 inch high, exposed grid double web system with intermediate-duty main beam capable of supporting 12 pounds per lineal foot and cross tees 9 pounds per lineal foot on a four foot span. Wall moulding shall be minimum 25 gauge electro-galvanized steel with factory applied white finish.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Installation shall be in accordance with manufacturer's directions by a Contractor approved by the manufacturer.
- B. Coordinate ceiling work with other trades, including Shaw's Subcontractors. Take field measurements for verification at least one week prior to installation.
- C. Wires used to suspend ceiling system shall be not less than 12 gauge, placed so that deflection does not exceed 1/360 of the span but in no case more than 48 inches on center. Each hanger shall be capable of supporting 150 pounds. Ceiling shall be suspended from the top chord of bar joist.
- D. Suspension system shall be reinforced to support lighting fixtures and diffusers and any additional members, installed as necessary. Coordinate with electrical and other trades.
- E. Align all members in both directions. Exposed surfaces shall be straight flush and level within 1/8" in 12'-0". Pattern shall be centered on room to give largest equal tile panel on opposite walls.
- F. Install main runners 48 inches on center and cross tees as required to form modules for indicated board size.
- G. Install appropriate edge moldings wherever grid system abuts walls, columns and other vertical surfaces.

- H. Install ceiling materials in the grid system, making cuts as required for special sizes, light fixtures, for sprinkler heads, and for other equipment or items which project through the finished ceilings.
- I. Clip all ceiling panels down in Vestibules with retention clips.

END OF SECTION

SECTION 09650

RESILIENT FLOORING

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. All materials and labor required to complete all resilient flooring, stair treads, and base.

1.02 RELATED WORK

- A. Refer to architectural drawings for specific interior decor material and finish selections. These selections shall be furnished exactly as indicated with no substitutions allowed.

1.03 SUBMITTALS

- A. Submit manufacturer's descriptive literature and full line of color samples for all products specified in accordance with Section 01300. Submit literature on the waterproof properties of adhesive.
- B. Moisture test results.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use. Store and handle materials according to manufacturer's recommendations in a manner to prevent damage or contamination with foreign matter.

1.05 ENVIRONMENTAL CONDITIONS

- A. Maintain minimum 70°F. temperature for 48 hours before, during, and 48 hours after installation.
- B. Test slab for acceptable moisture content using calcium chloride test kits. Perform a minimum of 5 tests at random locations throughout store.

1.06 EXTRA MATERIAL

- A. Furnish one extra case of each color tile used.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Vinyl Composition Tile: Azrock
- B. Vinyl Wall Base: VPI, Armstrong, R.C. Musson Rubber Co., Johnson Rubber Co., or Flexco Div., Textile Rubber Co., Inc.

2.02 RESILIENT FLOORING MATERIAL

- A. Vinyl Composition Tile: Conforming to FS SS-T-312, Type IV, Composition I: 12x12 inch size x 1/8 inch thick.
- B. Vinyl Base: Conforming to FS SS-W-40, coved with standard toe; 1/8 inch gauge; 4 inches high; matte finish; 100 foot roll lengths.

2.03 ACCESSORIES/ADHESIVES/SEALERS

- A. Sub-Floor Filler: Ardex Feather Edge premix latex, mix with water to produce cementitious paste. (Gypsum base product not acceptable.)
- B. Primers: Waterproof; type recommended by resilient flooring manufacturer for specific material.
- C. Adhesive: As recommended by the manufacturer.
- D. Metal edge where flooring terminates at concrete specified in Section 05500.
- E. Wax: Provide same product as used by Shaw's maintenance program.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Subfloor: Notify the Architect in writing of any defects in the subfloor and do not proceed until such defects have been corrected. Starting of work shall imply acceptance of the underflooring.
- B. Leveling:
 - 1. Remove subfloor ridges and bumps. Fill low spots, cracks, joints, holes and other flaws with sub-floor filler. Grind high spots to be level with adjacent area.
 - 2. Clean floor and apply, trowel and float filler to leave smooth, flat hard surface. Prohibit traffic until filler is cured.
 - 3. Surfaces to receive resilient flooring shall meet the minimum requirements established by the manufacturer of the flooring.

3.02 INSTALLATION - FLOORING

- A. General:
 - 1. Clean substrate. Spread cement evenly in quantity recommended by manufacturer to ensure adhesion over entire area of installation. Spread only enough adhesive to permit installation of flooring before initial set.
 - 2. Set flooring in place, press with heavy roller as recommended by the flooring manufacturer to ensure full adhesion.
 - 3. Terminate resilient flooring at centerline of door opening(s) where adjacent floor finish is dissimilar.
 - 4. Install edge strips at unprotected or exposed edges where flooring terminates.
 - 5. Scribe flooring to walls, columns, cabinets, floor outlets and other appurtenances to produce tight joints. Extend flooring into toe spaces, door reveals, and into closets and similar openings.

6. Install flooring in pan type floor access covers. Maintain floor pattern. Do not crowd and force tile against tile trim at trench duct. Install properly to prevent edge peaking and tile breakage.
7. Continue flooring through areas to receive equipment, cases, gondolas, etc., without interrupting floor pattern.
8. Install feature strips and floor markings where indicated. Fit joints tightly.

B. Resilient Tile:

1. Open floor tile cartons, enough to cover each area, and mix tile to ensure shade variations do not occur within any one area.
2. Install with minimum tile width 1/2 full size at room or area perimeter, to pattern detailed.
3. Lay flooring with joints parallel to produce symmetrical tile pattern.
4. Lay tile with pattern grain running in the same direction.
5. Tile terminating at concrete shall butt aluminum reducer strip. Reducer strip specified in Section 05500.

3.03 INSTALLATION - BASE

- A. Fit joints tight and vertical. Maintain minimum measurement of 18 inches between joints.
- B. Miter internal corners. Wrap outside corners with joints no closer than 12 inches from corner. Where it is not feasible to apply around corners use corner pieces.
- C. Install base on solid backing. Adhere tightly to wall and floor surfaces. Exercise extreme care to apply adhesive over entire area and up to the top edge, but not on the wall or floor areas not covered by base.
- D. Scribe and fit to door frames and other obstructions.
- E. Install straight and level to variation of plus or minus 1/8 inch over 10 feet.

3.04 CLEANING

- A. Clean all resilient flooring of fillers, primers, adhesives, dirt and other foreign substances. Apply one coat of wax immediately after installation in accordance with the manufacturer's instructions. If a delay occurs that suspends installation, wax flooring that has been installed. Final cleaning and additional waxing just before store opening will be done by Shaw's.

3.05 ADJUSTMENTS

- A. Inspect and make necessary adjustments within one month of time that heat is supplied continuously.
- B. All tiles that have not "seated" in a level plane with surrounding tile shall have heat applied locally and shall be quickly rolled to the surrounding level of floor tile. All tile showing minor breaks and fractures shall be replaced with heat and quick rolling.

C. All tiles showing broken corners or fracture lines shall be warmed, carefully removed, and new tile of same color and thickness substituted.

END OF SECTION

SECTION 09900

PAINTING

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Furnish all labor and materials to complete all painting and decorating as shown on Room Finish Schedule and/or herein specified.
 - 1. Painting and finishing as specified in Item 1.04.

1.02 SCHEDULE AND COLORS

- A. Before ordering materials, each manufacturer and each type of paint and color shall be approved by the Architect.
 - 1. Within 45 days after award of the Contract to the General Contractor, submit a schedule to the Architect, through the General Contractor, for approval, listing manufacturer and exact product description for each coat corresponding to Schedule of Finishes hereinafter specified in Item 1.04.
 - 2. For Sales Area, see architectural plans for interior decor material schedule and color selection.

1.03 WORKMANSHIP IN GENERAL

- A. All work shall be done by skilled mechanics experienced in the application of specified coating. All materials shall be evenly applied, so as to be free from sags, runs, crawls, or other defects. All coats shall be of proper consistency and well brushed out or rolled as to show the minimum of brush or lap marks, except varnish and enamel, which shall be uniformly flowed on. All brushes and rollers shall be clean and in good condition.
- B. No work shall be done under conditions that are unsuitable for the production of good results.
- C. All coatings shall be applied at manufacturer's recommended film thickness.

1.04 COVERAGE REQUIREMENTS

A. Exterior:

- 1. Exterior metal doors and frames, Shop primer
 steel stair frame, structural 2 coats exterior enamel
 steel, steel grillage, metal
 deck, louvers, steel columns.
- 2. Smooth face masonry block 2 coats concrete block paint
- 3. Clapboards & Wood trim, (all 1 coat oil-primer (back
 surfaces) prime)
 2 coats acrylic latex

B. Interior (General):

- | | |
|---|---|
| 1. Gypsum board walls | 1 coat latex primer-sealer
2 coats acrylic latex |
| 2. Interior metal doors and frames | Shop primer.
1 coat enamel undercoater
1 coat alkyd enamel
(eggshell). |
| 3. Wood doors, wood clear finish, | 1 coat primer
1 coat alkyd enamel
(semigloss) |
| 4. Miscellaneous metal, not otherwise finished, wall registers, channel and bent, plate door, frames, all exposed structural steel, stair stringers and risers. | Shop coat
2 coats alkyd enamel |

1.05 PRODUCT HANDLING

- A. Deliver materials in original container bearing manufacturer's labels.
- B. Store in single location in accordance with manufacturer's directions. Protect from freezing. Comply with fire regulations.

1.06 JOB CONDITIONS

- A. Environmental Requirements:
 - 1. Do no outside work during damp weather, when temperature is below 50°F., or until surfaces have thoroughly dried from effects of such weather.
 - 2. Maintain proper temperatures and adequate ventilation for inside work.
 - 3. Do no work when dust or insects are present.
- B. Protection: Protect all surfaces and finishes near area being painted.

1.07 EXTRA MATERIAL

- A. Leave unopened one gallon cans of paint for each type and color of paint used with Store Manager at project closeout.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. When no specific manufacturers of paint, varnishes, enamels, stains, etc. are specified, such materials shall be the product of the following approved manufacturers and shall be their highest grade of each type of material:

Pratt and Lambert	Benjamin Moore
Devoe	Martin Senour
Pittsburgh	Sherwin-Williams
Glidden	California
Porter	Tnemec

- B. Zinc-Rich Primer: Wilbur & Williams "Zinc-Shield," Devoe "Chem-Zinc," "Mobilzinc," or approved equal.
- C. Undercoater: Foundation coat for enamel. Pigments and vehicles shall be carefully selected to secure excellent flow and solid hiding, mixed and ground to maximum fineness to absolutely smooth, hard surface, devoid of brush marks, specks, and grit, that needs little or no sanding before applying enamel. Undercoater shall be tinted to match final coat.
- D. Exterior Enamel: "Totrust Metal Coat" as manufactured by Wilbur & Williams, Pratt & Lambert "Effecto," Sherwin-Williams "Kem Lustral Enamel," or equal.
- E. Alkyd-Eggshell Enamel: Durable alkyd that will withstand frequent washing, resistant to mars, scratches and abrasions, similar and approved equal to Pratt & Lambert "Cell-U-Tone" Satin, or Devoe "Velour Eggshell," Ben Moore's "Dulamel."
- F. Thinners:
1. Turpentine shall be used as a thinner in exterior paint only, shall be pure gum spirits of turpentine, and shall conform to the Standard Specifications of the ASTM, D-13, latest edition.
 2. Volatile mineral spirits shall be used as a thinner in interior paint, if required, if in accordance with manufacturer's directions. No turpentine shall be used in the interior of the building.
- G. Block Filler: A heavy-bodied latex type filler; Pratt & Lambert "Primafile," Sherwin-Williams "Block-Tex," Muralo pre-epoxy vinyl block filler, or approved equal, brushed or rolled at not over 75 square feet/gallon.
- H. Concrete Block Paint: Shall be Modac F solvent type acrylic coating over primer fill coat of Mofil, manufactured by Monsey Products Co., or 2 coats of Tneme-Crete Series 52 manufactured by Tnemec. 8 to 10 mils per coat dry film thickness.

PART 3 - EXECUTION

3.01 PREPARATION OF SURFACES

- A. All spaces shall be broom clean before painting is started and all surfaces to be painted shall be dry.
- B. Temperature of spaces in building where painting is being done, or where it is drying, shall be maintained above 50°F. and in mill for Shop painting at least 65°F. No exterior painting shall be performed below freezing.
- C. Before painting, all dust, dirt, plaster, grease, loose paint and other extraneous matter which would affect the finished work shall be removed. Finish hardware shall be removed prior to painting and replaced when painting is completed. Access doors shall be opened while painting and left open to dry.
- D. Exterior woodwork to be painted shall be cleaned, sanded and dusted.
- E. After priming coat has dried, apply not over two pound cut of shellac to all knots, pitch and sapwood, and putty all nail holes, cracks, open joints and other defects. Putty for natural finished woodwork shall match finish as closely as possible.

3.02 PROTECTIVE TREATMENT

- A. All exterior wood siding shall be primed and backprimed at the job before erection, with the primer coat of the material given in the Painting Schedule. Exterior trim shall be primed all edges as well as faces.
- B. Prime gypsum wallboard surfaces to receive wall covering with one coat of latex primer.

3.03 FINISH PAINTING

- A. All coats shall be thoroughly dry before the succeeding coat is applied. Allow at least 24 hours between coats, unless special paint is used that requires more or less time for drying.
- B. Painting coats, as specified, are intended to cover surface perfectly; if surfaces are not covered, further coats shall be applied.
- C. All parts of molding and ornaments shall be left clean and true to details.
- D. Finish shall be uniform as to sheen, color and texture.
- E. All coats shall be applied in strict accordance with the manufacturer's directions.
- F. Woodwork to be painted shall be sanded with #2/0 paper before finish coat.
- G. All edges, (including tops and bottoms of doors), shall be finished with same material and coats as surfaces.

3.04 CLEANING UP

- A. In addition to Article on "Cleaning Up" in GENERAL CONDITIONS, upon completion, remove all paint where it has been spilled, splashed or spattered on surfaces, including fixtures, hardware, glass, furniture, fittings, etc.

END OF SECTION

SECTION 15010

GENERAL REQUIREMENTS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Provide all labor, materials, accessories, and all other related items as required to complete all operations in connection with the complete installation of the plumbing, fire protection, HVAC and mechanical systems as shown on the Drawings and as specified herein.

1.02 RELATED REQUIREMENTS

- A. Conditions of the Contract and Division 1, General Requirements, apply to all the work, including the work of this Division. Examine all contract documents for requirements affecting the Work.
- B. Section 09900: Painting.

1.03 DRAWINGS

- A. The general location of the apparatus and the details of the work are shown on the Drawings. Exact locations not indicated shall be determined at the site as the work progresses and shall be subject to the Architect's approval.
- B. 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 with the highest possible quality available.

1.04 TEMPORARY HEAT

- A. Temporary heat and ventilation specified under Section 01535, Temporary Facilities.

1.05 ELECTRIC WORK

- A. Furnish and install all motors, pilot lights, controllers, limit switches, and all other related items for equipment provided under Division 15.
- B. Except as noted, all required line switches, fused switches, and all other related items and all necessary wiring to properly connect all equipment to motors and switches shall be furnished and installed under Division 16, Electric.
- C. Provide complete wiring system for automatic temperature controls as specified under Section 15950, Controls and Instrumentation. Shaw's shall provide complete FMS system including wiring for the remainder of the equipment.
- D. All wiring shall conform to the requirements of specification Division 16, Electric.

1.06 REQUIREMENTS

- A. Installation Directions: Obtain manufacturer's printed installation directions to aid in properly executing work on all major pieces of equipment.
- B. Objectionable Noise, Fumes and Vibration:
1. Mechanical and electrical equipment shall operate without creating objectionable noise, fumes, or vibration, as determined by the Architect.
 2. If such objectionable noise, fumes, or 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.
- C. Equipment Design and Installation:
1. Uniformity: Unless otherwise specified, equipment or material of same type of classification, used for same purposes, shall be product of same manufacturer.
 2. Design: Equipment and accessories not specifically described or identified by manufacturer's catalog numbers shall be designed in conformity with ASME, IEEE, or other applicable technical standards, suitable for maximum working pressure and shall have neat and finished appearance.
 3. Installation: Erect equipment aligned, level and adjusted for satisfactory operation; install so that connecting and disconnecting of piping and accessories can be made readily, and so that all parts are easily accessible for inspection, operation, maintenance and repair. Minor deviation for indicating arrangements may be made, as approved.
- D. Protection of Equipment and Materials: Responsibility for care and protection of all materials and mechanical work rests with the Contractor at all times until the entire project has been completed, tested and the project is accepted by the Owner.

1.07 ADJUSTMENTS AND OWNER'S INSTRUCTIONS

- A. After completion of the installation work called for in this Specification, the Contractor and his Subcontractors shall furnish necessary Mechanics or Engineers for the adjustment and operation of the plant, to the end that the plant may be perfectly adjusted and turned over to the Owners in perfect working order. The Contractor shall further instruct the Owner's authorized representative in the care and operation of the installation, providing all required framed instruction charts, directions, and all other related items. Refer to Section 01300, Administration, for further detail.

1.08 TESTING

- A. After the entire installation is completed, ready for operation, the Contractor shall test the systems. The Owner will provide all water and electric current for the tests. The Contractor shall provide necessary labor, test pump, gauges, meters, other instruments and materials. All tests shall be made in the presence of the Architect or his representative.

1.09 PAINTING

- A. Refer to Specification Section 09900.

1.10 ACCESS PANELS

- A. Access panels required for items furnished under Division 15 shall be provided for under this Division and installed under Divisions 4 and 9.
- B. Access panels shall be standard panels, 12" x 16" unless indicated otherwise. Door shall be flush type of 14-gauge steel hinged to 16-gauge frame. Shall be "Inryco/Milcor," style M as manufactured by Inryco, Inc., Miami-Carey "HM," or approved equal. Latch shall be operated by flush face screw. Doors and frames shall be factory primed.
- C. Access panels in fire-rated construction shall have the same UL rating as the wall, floor or ceiling in which they are installed.
- D. Access panels shall be installed in building construction where required for access to duct access doors or other components such as valves, air vents, actuators, volume dampers, motorized dampers in ductwork, and all other related items.

1.11 SUBMITTALS

- A. The Contractor shall, after award of Contract and before installation, submit for approval Shop Drawings, bulletins, product data, and all other related items in accordance with requirements of Section 01300.
- B. Submit Shop Drawings and product data as required in each section. Submittal shall include all physical data and performance data required to verify compliance with the Contract Documents.
- C. Submit samples in accordance with requirements of Section 01300.

1.12 OPERATING AND MAINTENANCE MANUALS

- A. Furnish in accordance with Section 01700 bound operating and maintenance manuals and forward to the Architect for review and transmittal to the Owner.
- B. Operating instructions shall be specified for each system and shall include copies of posted specific instructions.

- C. For maintenance purposes, provide Shop Drawings, parts lists, Specifications and manufacturer's maintenance bulletins for each piece of equipment.
- D. Provide name, address and telephone number of the manufacturer's representative and service company, for each piece of equipment so that service or spare parts can be readily obtained.
- E. Provide one copy of approved Shop Drawing for each piece of equipment.

1.13 CLEANING

- A. Remove all debris from site daily.
- B. All material and pieces of equipment shall be turned over to the Owner free of any dust and dirt, both inside and out.
- C. At the completion of the Project, all equipment shall have a clean, neat appearance of factory finish by cleaning or repainting as required.

1.14 SUBSTITUTIONS

- A. Comply with all provisions of the Instructions to Bidders, General Conditions and Division 1.
- B. The first item listed under "Acceptable Manufacturers" is the design basis. Other manufacturers listed may be used in the base bid, but dimensional and electrical data must be verified by the Contractor. Any modifications required shall be made at the Contractor's expense. For items that have no manufacturers listed, any item meeting all the specifications is acceptable.

1.15 COORDINATION

- A. Coordinate scheduling, submittals, and Work of the various Sections of Specifications to assure efficient and orderly sequence of installation of interdependent construction elements.
- B. Verify that utility requirement characteristics of operating equipment are compatible with building utilities. Coordinate work of various Sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.
- C. Coordinate space requirements and installation of mechanical and electrical work which are indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit, as closely as practicable; place runs parallel with line of building. Utilize spaces efficiently to maximize accessibility.
- D. In finished areas, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.
- E. Coordinate completion and clean up of Work of separate Sections in preparation for Substantial Completion.

- F. After Owner occupancy of premises, coordinate access to site for correction of defective Work and Work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

1.16 STARTING SYSTEMS

- A. Coordinate schedule for start-up of various equipment and Systems.
- B. Notify Architect/Engineer 10 days prior to start-up of each item.
- C. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, or other conditions which may cause damage.
- D. Verify that tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.
- E. Verify wiring and support components for equipment are complete and tested.
- F. Execute start-up under supervision of responsible Contractor's personnel in accordance with manufacturers' instructions.
- G. When specified in individual specification Sections, require manufacturer to provide authorized representative to be present at site to inspect, check and approve equipment or system installation prior to start-up, and to supervise placing equipment or system in operation. Submit a written report in accordance with Section 01300 that equipment or system has been properly installed and is functioning correctly.

1.17 EARTHQUAKE LOADS

- A. All air conditioning equipment and ducts shall be supported in accordance with the requirements of the BOCA National Building Code/1987, Section 1113.0 - "Earthquake Loads."

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 15170

MOTORS, DRIVES, AND ACCESSORIES

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Motors.
- B. Starters.
- C. Thermal overload protection.
- D. Belt drives.

1.02 SUBMITTALS

- A. Submit Shop Drawings in accordance with Section 01300.
- B. Submit Complete Manufacturer's Data and Installation Instructions for the Following:
 - 1. Motors.
 - 2. Starters.
 - 3. Thermal overload protection.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS - MOTORS

- A. Century.
- B. Baldor.
- C. Westinghouse.
- D. Or approved equal.

2.02 MOTORS

- A. Motors furnished shall meet NEMA requirements and shall have an operating temperature not to exceed 40EC above ambient temperature and be so marked, except as noted. All motors shall be of the open drip-proof type; motors of fully enclosed type may be furnished if it is the standard equipment of the manufacturer of the equipment. Provide curves of motor load vs. amperage draw for each motor size and type for motors 1 HP and larger.
- B. Motors shall operate at a maximum of 1800 rpm unless specifically noted. Each motor shall have a service factor of 1.15 and be rated for continuous duty. No motor shall have a power factor of less than 0.85.

C. Motors Shall Be Rated for the Following Efficiencies:

<u>Minimum Size</u>	<u>% Efficiency</u>
Less than 1 horsepower	Manufacturer's Standard
1 HP to 3 HP	80%
5 HP to 10 HP	85%
Above 10 HP	90%

2.03 ACCEPTABLE MANUFACTURERS - STARTERS AND OVERLOADS

- A. Cutler Hammer.
- B. Westinghouse.
- C. General Electric.
- D. Square D.
- E. I.T.E.
- F. Or approved equal.

2.04 STARTERS AND OVERLOADS

- A. Motor starters shall be furnished for all motors provided under this Section of these specifications. Each 3 phase motor starter shall have a 3-pole type, three element overload devices and shall have "ON-AUTO-OFF" switches in cover plate. They shall be general purpose NEMA rated for connected H.P. (definite purpose starters not acceptable) and shall have control power with fused transformers as required. Coordinate control voltage with Controls Contractor. Provide auxiliary contacts where required for interlocking of electrical equipment. Provide two-speed motor starters where indicated.
 - 1. Single Phase Motors Shall Have One of the Following Factory Wired Methods of Motor Protection:
 - a. Integral thermal overload protection in motor and cord with plug and receptacle in unit casing.
 - b. Integral thermal overload protection in motor and disconnecting switch mounted in or on casing as specified with equipment.
 - c. Switch with thermal overload protection for unprotected motors with switch serving as disconnect device.
- B. Thermal overload devices shall be sized for motor nameplate full load amps or field measured amp draw, whichever is less. Replace elements as required by field measurements.

2.05 V-BELT DRIVES

- A. Provide self-aligning roller-bearings mounted in sealed housings with grease fittings and grease overflow valves. Fan wheels and shafts shall be designed for critical speed at least 20% higher than the maximum fan speed. The assembled fan shall be statically and dynamically balanced at the factory. Bearings shall be certified to have an average life per AFBMA of not less than 200,000 hours.

- B. Provide adjustable belt drives for motors. Belts and pulleys shall be designed for a minimum 1.5 safety factor. The base shall be constructed to allow adjustment of belt tension without having to loosen motor hold-down bolts.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Coordinate motors, drives and accessories with equipment served.
- B. Install all items in accordance with the manufacturer's recommendations.

END OF SECTION

SECTION 15190

SYSTEM IDENTIFICATION

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Identification system for piping, equipment and controls including a complete valve chart.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Seton Nameplate Co.
- B. Or approved equal.

2.02 EQUIPMENT IDENTIFICATION

- A. All items of mechanical equipment such as HVAC units, fans, pumps, unit heaters shall be identified by approved nameplates. Nameplates shall be securely affixed, in a manner approved by the Architect, to each individual piece of equipment and also to include, but not be limited to, each starter, switch, relay, and transformer which controls this equipment. Nameplates shall bear notations corresponding to the same notations on the framed wiring diagrams and operating instructions. Nameplates shall be equal to Seton Nameplate Co., aluminum with a black enamel background and with etched or engraved natural aluminum lettering or laminated phenolic with white letters on black background, sizes as indicated.
- B. Furnish on all equipment, controls, switches, starters, relays, and transformers, approved nameplates describing the function and use of the equipment in non-technical language. Nameplates shall be minimum 2-1/2" x 3/4".
- C. Each piece of equipment shall be identified by a distinguishing number to be designated by the Architect. Furnish and securely affix to each unit an approved nameplate minimum 1-1/2" x 4" and with the designated number engraved in lettering not less than 1/4" high.
- D. The Contractor shall identify all electrical switches, pilot devices, pushbuttons, selector switches associated with the HVAC equipment, with approved nameplates describing their function and use in non-technical language. Nameplates to be minimum 2-1/2" x 3/4".
- E. The Contractor shall identify all pushbuttons, pilots, and controls on the control board(s) with an approved nameplate describing their function and use in non-technical language. Nameplates to be minimum 2-1/2" x 3/4".

2.03 IDENTIFICATION OF VALVES (BRASS VALVE TAGS)

- A. All valves shall be designated by distinguishing numbers and letters on required chart(s) and diagrams. The Contractor shall install approved brass tags or engraved laminated plastic tags, for all designated items, with numbers and letters on the tags corresponding to those on the chart(s) and diagram(s). Each valve identification tag to be minimum 19 gauge polished brass; or engraved laminated plastic; 1-1/2" diameter. Each tag to designate appropriate service (1/4" stamped black-filled letters) and appropriate valve number (1/2" stamped black-filled number). Tags shall be securely fastened to valves with approved brass "S" hooks, or brass jack chain, in a manner to permit easy reading. Each valve shall have an identifying letter designating the system, and an identifying number designating the unit. Identifying letters for various systems shall be, for example: HTG, PLBG. Abbreviations shall be approved by the Architect. A chart of all valves shall be furnished and include the following items:
1. Valve identification number.
 2. Location.
 3. Purpose.
- B. Chart to be mounted in a frame (aluminum with plexiglas) and secured on a wall in the Mechanical Room or in a location as otherwise directed by the Architect.

2.04 IDENTIFICATION OF PIPING

- A. All service piping which is accessible for maintenance operations (except piping in finished spaces) will be identified with pressure-sensitive vinyl identification markers. Direction of flow arrows are to be included on each end of the marker. In conformance with "Scheme for the Identification of Piping Systems" (ANSI A13.1-1975), each marker must show (1) approved color-coded background, (2) proper color of legend in relation to background color, (3) approved legend letter size, and (4) approved marker lengths. For pipes under 3/4" O.D. (too small for color bands and legends), brass identification tags 1-1/2" in diameter with depressed 1/4" high black-filled numbers will be fastened securely at specified locations.

PART 3 - EXECUTION

3.01 PIPE MARKER LOCATIONS

- A. Mark Each Pipe in the Following Locations:
1. Adjacent to each valve and fitting.
 2. At each branch and riser take-off.
 3. At each pipe passage through wall, floor and ceiling construction.
 4. At each pipe passage to underground.
 5. On all horizontal pipe runs - marked every 25 feet.

3.02 COORDINATION WITH EXISTING

- A. Where an existing equipment identification system is involved, the new system shall be coordinated and compatible with the existing system.
- B. Provide identification tags for existing rooftop HVAC units as indicated on the Drawings.

END OF SECTION

SECTION 15258

DUCT INSULATION

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Duct thermal insulation.
- B. Adhesives, tie wires, tapes.
- C. Jacketing.

1.02 RELATED WORK

- A. Section 15890: Ductwork and Ductwork Accessories.

1.03 SUBMITTALS

- A. In accordance with Section 01300, submit Shop Drawings and samples.
- B. Submit Shop Drawings which indicate complete material data, a list of materials proposed for this project and indicate thickness of material for individual services.
- C. Submit samples of proposed insulating materials.

1.04 JOB CONDITIONS

- A. Deliver material to job site in original non-broken factory packaging, labeled with manufacturer's density and thickness.
- B. Perform work at ambient and equivalent temperatures as recommended by the adhesive manufacturer.
- C. Application shall be by experienced insulation mechanics with smooth surfaces and square corners and edges ready to receive finish paint in accordance with the best practice of the trade using methods recommended by the manufacturer and approved by Shaw's Representative.

1.05 ALTERNATIVES

- A. Alternative insulations are subject to approval. Alternatives to provide same thermal resistance within 10%, at normal conditions, as material specified.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Owens Corning.
- B. Schuller.

C. Certainteed.

D. Knauf.

E. Or approved equal.

2.02 GENERAL

A. Adhesives and Insulation Materials:

1. Composite fire and smoke hazard ratings maximum 25 for flame spread and 50 for smoke developed.
2. Adhesives to be waterproof.
3. All insulation and materials shall be asbestos-free. No fibers shall be released from any material with dimensions similar to asbestos fibers.

B. No interior duct insulation or acoustically lined ductwork will be permitted.

2.03 MATERIALS AND COMPONENTS

A. Round Ducts and Rectangular Ducts:

1. Flexible fibrous glass insulation.
2. "K" value at 75EF, maximum 0.26 BTU-in/(sq. ft.- hr - EF.) with factory applied reinforced aluminum foil vapor barrier.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Install covering after ductwork and equipment have been tested and approved.
- B. Ensure surface is clean and dry prior to installation. Ensure insulation is dry before and during application, and after construction. Any wet insulation must be replaced. Finish with system at operating conditions.

3.02 INSTALLATION

- A. Ensure insulation is continuous through inside walls. Pack around ducts with fireproof self-supporting insulation material, properly sealed.
- B. Finish insulation neatly at hangers, supports and other protrusions.
- C. Locate insulation or cover seams in least visible locations.
- D. Provide jackets on exposed insulation throughout, including equipment room. Insulation located in crawl spaces, shafts and suspended ceiling spaces is not considered exposed. Use pre-sized paper at uneven insulated surfaces.
- E. Round Ducts and Rectangular Ducts:
1. Adhere flexible insulation to ductwork with adhesive applied in 6 inch wide strips on 16 inch centers.

2. Provide 16 gauge annealed tie wire tied, spiral wound or half hitched at 16 inch centers for securing duct insulation until adhesive sets.
 3. Butt insulation and seal joints and breaks with 2 inch lap of foil adhered over joint.
- F. Repair separation of joints or cracking of insulation due to thermal movement or poor workmanship.
- G. All concealed supply and return ductwork from fan outlet to diffusers shall be completely insulated. Exposed ductwork in conditioned spaces shall not be insulated.
- H. All concealed supply and return ductwork shall be insulated with 1-1/2 inch thickness heavy density flexible vapor seal duct insulation with FRK facing applied with Foster No. 81-99 adhesive applied in strips 6 inches wide on 12 inch centers and, in addition, install mechanical fasteners on minimum of 18 inch centers. Butt all edges of insulation and seal all joints and breaks with tape or flange of 4 inch minimum width. Adhere in place with vapor barrier adhesive, or equal.
- I. Standing seams, supporting angles and flanges on all insulated ductwork shall be insulated with thickness equal to the duct, and all edges shall be finished and vapor sealed.
- J. Mechanical fasteners shall not be riveted or screwed to the duct and shall not penetrate the metalwork.

END OF SECTION

SECTION 15781

PACKAGED ROOFTOP AIR CONDITIONING UNITS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Packaged rooftop unit.
- B. Unit controls.
- C. Roof mounting frame and base.
- D. Maintenance service.

1.02 RELATED SECTIONS

- A. Section 15258: Duct Insulation.
- B. Section 15885: Filters.
- C. Section 15950: Controls and Instrumentation.

1.03 REFERENCES

- A. ANSI/NFPA 90A - Installation of Air Conditioning and Ventilation Systems.
- B. ARI 210 - Unitary Air-Conditioning Equipment.
- C. ARI 240 - Air Source Unitary Heat Pump Equipment.
- D. ARI 270 - Sound Rating of Outdoor Unitary Equipment.

1.04 SUBMITTALS

- A. Submit Shop Drawings and product data under provisions in accordance with Section 01300.
- B. Submit Shop Drawings and product data for manufactured products and assemblies required for this project.
- C. Indicate electrical service and duct connections on Shop Drawings or product data.
- D. Submit manufacturer's installation instructions under provisions of Section 01300.
- E. Distribution Procedure:
 - 1. The Manufacturer Shall Submit 10 Copies as Follows:
 - a. 1 copy to Shaw's project manager
 - b. 1 copy to George Aloupis
 - c. 8 copies to the Architect.
 - 2. Once the Architect Has Stamped the 8 Copies, the Architect Shall Distribute Them as Follows:

- a. 2 copies to the manufacturer
- b. 2 copies to the general contractor
- c. 1 copy to the mechanical contractor
- d. 1 copy to Shaw's project manager
- e. 1 copy to George Aloupis
- f. 1 copy for the Architect's records

1.05 OPERATION AND MAINTENANCE DATA

- A. Submit operation and maintenance data under provisions of Section 01300.
- B. Include manufacturer's descriptive literature, operating instructions, installation instructions, maintenance and repair data and parts listing.
- C. Distribution procedure:
 1. The manufacturer shall submit 3 copies to the Mechanical Contractor.
 2. The mechanical contractor shall be responsible for transferring the 3 copies to the general contractor.
 3. The general contractor shall include the 3 copies in the O/M manual.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Protect units from physical damage by storing off site until roof mounting frames are in place, ready for immediate installation of units.

1.07 WARRANTY

- A. Provide one year warranty starting from date of substantial completion.

1.08 MANUFACTURERS AND HVAC CONTRACTORS SERVICE AND MAINTENANCE RESPONSIBILITIES

- A. The HVAC rooftop units shall be the total responsibility of the HVAC Contractor. The HVAC Contractor shall provide unit start-up, one (1) full year of service and maintenance which will include four (4) inspections. Provide 24 hour emergency service on breakdowns and malfunctions. Include maintenance service as outlined in the manufacturer's operating and maintenance data. Sign in with Store Manager upon arrival. Submit a copy of service call work order or report and include description of work performed. Mail report to Shaw's Maintenance Manager.
- B. The HVAC rooftop unit manufacturer shall be responsible for furnishing to the HVAC Contractor any defective components within 24 hours, otherwise allowing local purchase by the HVAC Contractor. The manufacturer shall also be responsible for providing any technical assistance (on site if required) in connection with the unit start-up, repair or replacement of any unit component for a period of one (1) year from acceptance of systems by Shaw's.

PART 2 - PRODUCTS

2.01 H.V.A.C. ROOF TOP UNITS

A. Manufacturers:

1. Trane.
2. Units shall be purchased by Shaw's and assigned to the Mechanical (HVAC) Contractor. Mechanical (HVAC) Contractor shall be responsible for unit delivery, scheduling and all items regarding equipment installation, including crane. All warranties on unit, required through the General and Mechanical (HVAC) Contractors shall not be violated.

Note: One manufacturer shall be used for all unitary rooftops per job.

B. Equipment Specification - HVAC Rooftop Units:

1. Manufactured Units:
 - a. Provide roof mounted units having natural gas burner and electric refrigeration.
 - b. Unit shall be self-contained, packaged, factory assembled and prewired, consisting of the following:
 - (1) Cabinet and frame.
 - (2) Supply fan.
 - (3) Heat exchanger and burner.
 - (4) Controls.
 - (5) Air filters.
 - (6) Refrigerant cooling coil and compressor.
 - (7) Condenser coil.
 - (8) Condenser fan.
 - (9) Specific items required by Shaw's.
2. Cabinet:
 - a. Galvanized steel with baked enamel finish, access doors or removable access panels with quick fasteners.
 - b. Structural members shall be minimum 18 gauge with access doors or removable panels of minimum 20 gauge.
3. Insulation:
 - a. One (1) inch thick matt faced glass fiber in air handling section surfaces and foil faced insulation in heat exchanger section.
 - b. Protect edges form erosion.
4. Heat Exchangers: Aluminized steel, of welded construction.
5. Supply Fan:
 - a. Centrifugal type, direct drive or V-belt drive, with adjustable variable pitch motor pulley.
 - b. Isolate complete fan assembly.
 - c. Units shall be provided with oversized evaporator fan motors.
6. Air Filters: Refer to Section 15885, Filters.
7. Roof Mounting Frame:
 - a. 14 inches high galvanized steel, channel frame with gaskets, nailer strips.
 - b. Curb shall be fully insulated.
8. Gas Burner:
 - a. Power Burner with negative pressure gas valve, two (2) firing stages, if available, pressure regulator, gas valves, manual shut-off, intermittent ignition, flame sensing device and automatic 100% shut-off.
 - b. Burner shall be able to fire on natural gas.

9. Gas Burner Safety Controls:
 - a. Energize ignition, limit time for established of flame, prevent opening of gas valve until pilot flame is proven, stop gas flow on ignition failure, energize blower motor and, after airflow proven and slight delay, allow gas valve to open.
 - b. Controls shall be ANSI approved.
10. High Limit Control: Dual temperature sensors (above heat exchanger and in discharge air) with fixed stop at maximum permissible setting, de-energize burner on excessive temperature and energize burner when temperature drops to lower safe value.
11. Supply Fan Control: Supply fan may operate either continuously or on intermittent operation upon call for heat. A timer shall energize supply fan or FMS System may call for continuous fan operation.
12. Evaporator Coil:
 - a. Provide copper tube aluminum fin coil assembly with galvanized drain pan and copper condensate trap and connection.
 - b. Provide capillary tubes or fixed restriction expansion device for all units.
13. Compressor:
 - a. Provide hermetic compressor, 3,600 rev/min maximum, resiliently mounted with positive lubrication, crankcase heater, high and low pressure safety controls, motor overload protection, gauge ports, and filter dryer.
 - b. Three minute timed off circuit shall delay compressor start.
 - c. Provide step capacity control by cycling compressors.
 - d. Units 7.5 Tons or larger shall have two (2) compressors.
14. Condenser:
 - a. Provide copper tube aluminum fin coil assembly with sub-cooling rows.
 - b. Provide direct drive propeller fans, resiliently mounted with fan guard, motor overload protection, wired to operate with compressor.
 - c. Provide refrigerant pressure switch to cycle condenser fans.
15. Supply/Return Casing - Dampers: Manual outside air damper with thumbscrew locking mechanism.
16. Outside and Return Air Damper Section:
 - a. The outside and return air section shall be designed to form a plenum.
 - b. The outside air arrangement shall be fixed.
 - c. The outside air damper shall be mounted on the air intake hood, complete with rain lip and bird screen.
 - d. The dampers shall be fixed.
17. Specific Items Required by Shaw's:
 - a. Full perimeter roof curb.
 - b. Manual outside air damper.
 - c. Programmable night setback thermostat.
 - d. Anti-cycle timer.
 - e. Time delay timer (for two (2) compressor systems).
 - f. Low ambient to 0 F.
 - g. Oversized evaporator fan motor, (factory installed). If for any reason the standard evap. motors are required when units are started or are being balanced, the HVAC Contractor shall contact the unit manufacturer who shall provide the change over within 24 hours, at no cost.
 - h. Five (5) year compressor warranty.
 - i. Ten (10) year heat exchanger warranty.

- j. Square "D" heavy-duty outdoor disconnect with two (2) sets of fuses.
- k. One (1) spare set of belts, when required.
- l. Units shall be UL approved and shall bear UL labels.

PART 3 - EXECUTION

3.01 HVAC ROOFTOP UNITS

- A. Examination:
 - 1. Verify that roof is ready to receive work and opening dimensions are as indicated on Shop Drawings.
 - 2. Verify that proper power supply is available.
- B. Installation:
 - 1. Install in accordance with manufacturer's instructions.
 - 2. Mount units on factory built roof mounting frame providing watertight enclosure to protect ductwork and utility services.
 - 3. Install roof mounting frame level.
- C. Manufacturer's and HVAC Contractor's Field Services and Maintenance Responsibilities: Refer to Part 1, General, 1.08 - Manufacturer's and HVAC Contractor's Service and Maintenance Responsibilities, A., B. and C.
- D. Section 15781, Packaged Rooftop Air Conditioning Units: All air conditioning equipment and ducts shall be supported in accordance with the requirements of the locally adopted BOCA National Building Code - Earthquake Loads.

END OF SECTION

SECTION 15835

TERMINAL HEAT TRANSFER UNIT

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Gas-fired unit heaters.
- B. Electric baseboard (units are to be furnished, installed, and wired under the Electrical Section of Specifications).

1.02 RELATED SECTIONS

- A. Section 15950: Controls and Instrumentation.

1.03 REFERENCES

- A. ANSI/NEPA 70 - National Electrical Code.

1.04 SUBMITTALS

- A. In accordance with Section 01300, submit Shop Drawings and product data under provisions of Section 01300.
- B. Submit Shop Drawings indicating cross section of cabinets, grille, bracing and reinforcing, and typical elevation.
- C. Submit product data indicating typical catalog of information including arrangements.
- D. Submit schedules of equipment and enclosures typically indicating length and number of pieces of element and enclosure, corner pieces, end caps, cap strips, access doors, pilaster covers and comparison of specified heat required to actual heat output provided.
- E. Indicate mechanical and electrical service locations and requirements, specifically indicating deviations from indicated products.
- F. Submit manufacturer's installation instructions under provisions of Section 01300.

1.05 PROJECT RECORD DOCUMENTS

- A. Submit record documents under provisions of Section 01300.

1.06 OPERATION AND MAINTENANCE DATA

- A. Submit operation and maintenance data under provisions of Section 01300.
- B. Include manufacturer's descriptive literature, operating instructions, installation instructions, maintenance and repair data and parts listings.

1.07 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing the products specified in this Section with minimum three (3) years experience.

1.08 REGULATORY REQUIREMENTS

- A. Conform to applicable code for internal wiring of factory wired equipment.

PART 2 - PRODUCTS

2.01 MANUFACTURERS - UNIT HEATERS

- A. Reznor.
- B. Trane.
- C. Sterling.

NOTE: One manufacturer shall be used for all units per job.

2.02 GAS-FIRED UNIT HEATERS

- A. Units shall be complete including:
 - 1. Propeller type wheel with fingerproof guard and direct drive motor with adjustable double deflection discharge louvers.
 - 2. Provide motor with thermal overload protection and motor starter for mounting near unit. See Section 15170 for specifications on motor, starter and disconnect. All electrical connection points shall be enclosed in an approved box with cover.
 - 3. Provide fan and limit control to prevent fan from operating before heat exchanger has warmed up and to keep fan running after burner is off to cool heat exchanger.
- B. The natural gas burner shall be of the atmospheric type. The main and pilot valve train to the burner shall be completely factory piped and wired and shall include the following minimum components:
 - 1. Main and pilot manual shut-off valves.
 - 2. Main and pilot gas pressure regulators.
 - 3. Main and pilot gas filtration.
 - 4. Adequate unions for service.
 - 5. Provide required equipment and orifices for natural gas or locally provided mixtures.
- C. Gas train shall comply with AGA requirements.
- D. Controls Shall Include the Following:
 - 1. Electronic spark ignited pilot and pilot flame proving control.
 - 2. Main gas valve operation only after pilot proven.
 - 3. Shutdown of main gas valve on flame failure.
 - 4. Intermittent ignition - pilot gas on only during run cycle.
 - 5. Main gas and pilot gas valves closed during off cycle.
- E. Provide junction box to permit burner and fan motors to operate from a single power connection.

- F. Primary heat exchanger shall be made of Type 400 stainless steel. All secondary heat transfer surface shall be constructed from not less than 14 gauge mild steel.
- G. Provide with an inspection port, large service door and two (2) cleanout ports.
- H. Units shall be AGA and certified, and shall bear both AGA and UL labels.
- I. Control of units by Shaw's FMS system.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify that surfaces are ready to receive work and opening dimensions are as instructed by the manufacturer.
- B. Verify that required utilities are available, in proper location and ready for use.
- C. Beginning of installation means installer accepts existing surfaces.

3.02 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Hang unit heaters from building structure, with pipe hangers anchored to building, not from piping. Mount as high as possible to maintain greatest headroom unless otherwise indicated.
- C. Unit heaters shall be installed with two (2) point suspension. Four (4) point suspension shall be provided if available.
- D. Protect units with protective covers during balance of construction.
- E. Install electric heating equipment including devices furnished by manufacturer but not factory mounted. Furnish copy of manufacturer's wiring diagram submittal. Verify that electrical wiring installation is in accordance with manufacturer's submittals and installation requirements of Division 16 Sections.

3.03 CLEANING

- A. After Construction Is Completed, Including Painting:
 - 1. Heat exchangers, clean exposed surface of units.
 - 2. Vacuum clean coils, heat exchangers and inside of cabinets.
- B. Touch-up marred or scratched surfaces of factory finished cabinets, using finish materials furnished by manufacturers.

END OF SECTION

SECTION 15870

EXHAUST FANS

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. Roof exhausters.

1.02 REFERENCES

- A. AMCA 99 - Standards Handbook.
- B. AMCA 210 - Laboratory Methods of Testing Fans for Rating Purposes.
- C. AMCA 300 - Test Code for Sound Rating Air Moving Devices.
- D. AMCA 301 - Method of Publishing Sound Ratings for Air Moving Devices.
- E. SMACNA - HVAC Metal Duct Construction Standard.

1.03 QUALITY ASSURANCE

- A. Performance Ratings:
 - 1. Conform to AMCA 210.
 - 2. Bear the AMCA Certified Rating Seal.
- B. Sound Ratings:
 - 1. Conform to AMCA 301.
 - 2. Tested to AMCA 300.
 - 3. Bear the AMCA Certified Sound Rating Seal.
- C. Fabrication: Conform to AMCA 99.
- D. All fans shall be UL approved and shall bear UL labels.

1.04 SUBMITTALS

- A. In accordance with Section 01300, submit Shop Drawings and product data.
- B. Provide product data roof exhausters.
- C. Provide fan curves with specified operating point clearly plotted.
- D. Submit sound power levels for both fan inlet and outlet at rated capacity.
- E. Submit manufacturers installation instructions under provisions of Section 01300.

PART 2 - PRODUCTS

2.01 EXHAUST FANS

A. Acceptable Manufacturers:

1. Penn.
2. Jenn Air.
3. Cook.
4. Greenheck.
5. Acme.

NOTE: One manufacturer shall be used for all exhaust fans per job.

2.02 ROOF EXHAUSTERS

A. Centrifugal or Axial Fan Unit:

1. V-belt or direct driven.
2. Spun aluminum housing.
3. Resiliently mounted motor.
4. 1/2 inch mesh, 16 gauge aluminum bird screen.
5. Square to base to suit roof curb with continuous curb gaskets.
6. Secured with cadmium-plated bolts and screws.

B. Roof Curb:

1. 12 inches high.
2. Continuously welded seams.
3. Built in cant strip.
4. 1 inch insulation and curb bottom.
5. Factory installed door nailer strip.

C. Gravity Backdraft Damper:

1. Aluminum multiple blade construction.
2. Felt edged with nylon bearings where indicated.
3. Gravity backdraft dampers are not required when motorized dampers are provided.

D. Sheaves:

1. Cast iron or steel, dynamically balanced, bored to fit shafts and keyed.
2. Variable and adjustable pitch motor sheave selected so required rpm is obtained with sheaves set at mid-position.
3. Fan shaft with self-aligning pre-lubricated ball bearings.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Secure roof exhausters with lag screws to roof curb.
- C. Refer to Schedule for additional information.

END OF SECTION

SECTION 15885

FILTERS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Disposable panel filters.
- B. Disposable, extended area panel filters.
- C. Filter frames.

1.02 RELATED WORK

- A. Section 15781: Packaged Rooftop Air Conditioning Units.
- B. Section 15890: Ductwork and Ductwork Accessories.

1.03 REFERENCES

- A. ANSI/UL 586 - Test Performance of High Efficiency Particulate, Air Filter Units.
- B. ANSI/UL 900 - Test Performance of Air Filter Units.
- C. ASHRAE 52 - Method of Testing Air Cleaning Devices Used in General Ventilation for Removing Particulate Matter.
- D. MIL-STD-282 - Filter Units, Protective Clothing, Gas-Mask Components and Related Products: Performance-Test Methods.

1.04 QUALITY ASSURANCE

- A. Filter media shall be ANSI/UL 900 listed, Class 1 or Class 2, as approved by local authorities.
- B. Provide all filters as product of one manufacturer.
- C. Assemble filter components to form filter banks from products of one manufacturer.

1.05 SUBMITTALS - (If Required)

- A. In accordance with Section 01300, submit Shop Drawings and product data on filter media, filter performance data, filter assembly and filter frames. Include dimensions, motor locations and electrical connections.

1.06 OPERATION AND MAINTENANCE DATA

- A. Submit operation and maintenance data under provisions of Section 01300.
- B. Include instructions for operation, changing and periodic cleaning.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Farr.

2.02 DISPOSAL, EXTENDED AREA PANEL FILTERS

A. Media:

1. Pleated, lofted, non woven, reinforced cotton fabric.
2. Supported and bonded to welded wire grid.
3. Enclosed in cardboard frame.
4. Scheduled size.

B. Rating:

1. ASHRAE 52.
2. 25-30% dust spot efficiency, 90-92% weight arrestance.
3. 500 FPM face velocity, 0.30 inch WG initial resistance, 1.0 inch WG recommended final resistance.

C. Model: 30-30 manufactured by Farr.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Install air cleaning devices in accordance with manufacturer's instructions.
- B. Prevent passage of unfiltered air around filters with felt, rubber or neoprene gaskets.
- C. Do not operate fan system until filters (temporary or permanent) are in place.
- D. Filters in units shall be changed once a month prior to store opening and once the week before store opening. Filters shall be changed once per month after store opening for the first 12 months. See Section 01535, Par. 1.05.C.1 regarding the use of temporary filters.
- E. Filter changes shall be provided by Shaw's and shall NOT be the H.V.A.C. Contractor's Responsibility.
- F. Shaw's Project Manager shall engage the local Filter Replacement Firm used by Shaw's Maintenance Department to provide filter changes as outlined in this section.

END OF SECTION

SECTION 15890

DUCTWORK AND DUCTWORK ACCESSORIES

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Ductwork.
- B. Flexible Duct and Connector.
- C. Drip Pans
- D. Diffusers, Registers and Grilles.
- E. Duct Sleeves.
- F. Access Doors.
- G. Dampers.
- H. Flues.

1.02 RELATED WORK

- A. Section 15781: Packaged Rooftop Air Conditioning Units.
- B. Section 15870: Exhaust Fans.
- C. Section 15885: Filters.
- D. Section 15950: Controls and Instrumentation.
- E. Section 15990: Testing and Balancing Air Systems.

1.03 SUBMITTALS

- A. In Accordance with Section 01300, Shop Drawings Are as Follows:
 - 1. Layout of all ductwork including all fittings.
 - 2. Duct construction standards including all gauges, reinforcing and spacing. Do not submit SMACNA Manual alone. Include standards to be used.
 - 3. Duct sealing materials and standards.
- B. Manufacturer's Data:
 - 1. Dampers.
 - 2. Flexible ducts and connectors.
 - 3. Bird screens.
 - 4. Diffusers, registers and grilles.
 - a. Submit a schedule of all inlets and outlets indicating location, catalog model number, manufacturer, dimensional information, sound pressure level rating, nominal rated volumetric flow rate (cfm), neck or face velocity at specified cfm, pressure drop at specified cfm, throw and drop for outlets, range for diffusers and maximum and minimum cfm

modulation.

5. Sheet metals.
6. Exhaust hood systems.

C. Certified Test Reports:

1. Automatic dampers.
 - a. Submit certification of damper leakage testing and conformance with AMCA 500 and specified maximum leakage or pressure drop requirements.
2. Sound pressure level rating of inlets and outlets (diffusers, registers and grilles).
3. Corrosion protection.

D. SMACNA Duct Construction Manuals:

1. The SMACNA recommendations shall be considered as mandatory requirements.
2. Substitute the word "shall" for the word "should" in these manuals.
3. No negative pressure construction for 4 inch, 6 inch or 10 inch water gauge is provided herein.

1.04 OPERATION AND MAINTENANCE DATA

- A. Submit operation and maintenance data under provisions of Section 01300.
- B. Include manufacturer's descriptive literature, operating instructions, installation instructions, maintenance and repair data and parts listing.

PART 2 - PRODUCTS

2.01 BASIC MATERIALS (FOR METAL DUCT)

- A. Galvanized Steel Sheets:
 1. ASTM A 527.
 2. Coating designation G90.
- B. Galvanized Steel Hot-Dipped After Fabrication: ASTM A 123.

2.02 PRESSURE CLASSIFICATION

- A. Ratings as indicated on the drawings.
- B. If no ratings are indicated, ductwork shall be rated for the external static pressure of the system plus 25%.

2.03 DUCT LEAKAGE

- A. All ductwork shall be sealed as outlined in the HVAC Duct Construction Standards Metal and Flexible by the Sheet Metal and Air Conditioning Contractors National Association, Inc. (hereinafter referred to as SMACNA HVACDCS). All ductwork shall be sealed to a minimum of Class C as outlined in the manual.

- B. Materials for Sealing:
 - 1. Hardcast tape.
 - 2. Silicon caulking.
 - 3. Ductmate with gaskets.
 - 4. Or approved equal.

2.04 GENERAL DUCT CONSTRUCTION

- A. Construct ducts of galvanized steel.
- B. Construction:
 - 1. Duct construction, metal gauges and hangers and support reinforcements shall conform with the SMACNA HVACDCS.
 - 2. Ducts shall not pulsate or vibrate when in operation.
 - 3. Curved elbows shall have a centerline radius not less than 1-1/2 times the width of ducts.
 - 4. All rectangular elbows shall have single thickness turning vanes with trailing edges.
- C. Joints:
 - 1. Construct joints to meet the requirements of the leakage test specified herein.
 - 2. Duct components shall fit so that joints are not mismatched.
 - 3. Do not use duct sealant and tape to compensate for mismatched connections.
 - 4. Longitudinal locks or seams known as "Button-Punch Snap-Lock" will not be permitted.
 - 5. Apply fire-resistant sealing compound to exposed male part of fitting collars so that sealer will be on the inside of the joint and fully protected by the metal of the duct and fitting.
 - 6. Apply 1 brush coat of sealing compound over the outside of the joint to at least 2 inch band width covering all screwheads and joint gap.
 - 7. When tape is used, apply a single wrap of a duct tape over the wet sealer.
 - 8. The tape used shall be as recommended by the sealer manufacturer to permit proper curing of the sealer.
 - 9. Dents in the male portion of the slip fitting collar will not be acceptable.
- D. Fittings:
 - 1. Square elbows, round elbows, fittings, branch takeoffs, transitions, splitters, duct volume dampers, fire dampers, flexible connections and access doors shall conform with the SMACNA HVACDCS, Section 2.
 - 2. Rectangular branches shall be 45° takeoffs and conical takeoff shall be used for round branches. Each branch line shall have a volume damper installed.
 - 3. Round Elbows:
 - a. Provide 45E and 90E elbows of 2 piece die stamped construction for ducts 8 inches or less in diameter.
 - b. For ducts over 8 inches in diameter, provide 5 mitered piece for 90° and 3 mitered piece for 45°.
- E. Round and Oval Ducts:
 - 1. SMACNA HVACDCS, Section 3.
 - 2. If round or oval duct is submitted to be used as opposed to

rectangular, Shaw's Representative MUST approve first.

3. Provide all price changes and engineering calculations to Shaw's Representative for review and approval.

F. Rectangular Ducts:

1. Make joints between sections of duct and between ducts and fittings with either gasketed flanged connection, welded flange joints or other joints recommended in SMACNA HVACDCS, Section 1.
2. Reinforce at the joints and between the joints as recommended.

2.05 FLEXIBLE DUCTS AND CONNECTORS

- A. UL 181, Class 1, UL listed, SMACNA HVACDCS and additional requirements herein specified.
- B. Use to connect between rigid ducts and outlets or terminals (Supply Air duct systems only).
- C. There shall be no erosion, delamination, loose fibers or odors from the ducts into the airstream.
- D. At 250EF, minimum rating pressures shall be 2 inches water positive and 1-1/2 inches negative up to 2,500 cfm flexible ducts.
- E. Flexible Ducts shall be maximum 5 feet in length and will be permitted to connect supply air diffusers only. Flexible Ducts will NOT be permitted for return air or exhaust air duct systems.
- F. Minimum bend radius shall be twice the duct diameter.
- G. Materials: Interlocking spiral or helically corrugated type constructed of zinc-coated steel or woven non-collapsible fire-retardant mineral fabric.
- H. Insulation and Vapor Barrier:
 1. ASTM C 553.
 2. Minimum 1 inch nominal thickness and 1 lb./cu. ft. density.
 3. The insulation shall be sheathed with a vapor barrier having a maximum water vapor permeance of 0.02 perm per ASTM E 96, Procedure C.
 4. Coat ends of insulation with cement to prevent erosion and delamination.
- I. Joints:
 1. Make airtight slip-joints, seal with pressure sensitive vapor-seal adhesive tape or duct sealer and secure with sheetmetal screws.
 2. To prevent insulation compression, place 2 inch wide by 1 inch thick closed cell foam plastic spacers over the joints under vapor barriers.
 3. To provide a vaportight joint, use a corrosion resistant steel clamp over such spacers.

2.06 DRIP PANS

- A. Provide each cooling coil section in both field and factory assembled casings with a stainless or galvanized steel drip pan not less than 18 gauge with copper drain connections.

- B. Drip pans shall collect, confine and dispose of all condensate from cooling coils and attachments, including headers, return bends, distributors and uninsulated pipe and fittings.
- C. Where individual eliminator blades are in section (not in one piece from top to bottom of coil bank), provide auxiliary drip troughs at bottom of each section with copper drains to drip pans.
- D. Insulate drip pans with water impervious insulation of sufficient thickness to prevent condensate formation on the exterior at ambient conditions to be encountered.

2.07 ACCEPTABLE MANUFACTURERS - GRILLES, REGISTERS AND DIFFUSERS

- A. Metalaire.
- B. Titus.
- C. Anemostat.
- D. Agitair.

2.08 APPLICATION

- A. Rate Units in accordance with ADC standards.
- B. Base air outlet application on space noise level for a maximum NC level of 30.
- C. Supply outlets with sponge rubber seal around edge.
- D. Baffles to direct air away from walls, columns or other obstructions within radius of diffuser operation.
- E. Plaster frame for diffusers located in plaster surfaces.
- F. Anti-smudge frames or plaques on diffusers located in rough textured surfaces such as an acoustical plaster.
- G. All registers, grilles, and diffusers shall be finished in a factory baked, off white enamel or an equivalent finish approved by the Architect.

2.09 RETURN AND EXHAUST GRILLES

- A. For sidewall and ceiling exhaust grilles, provide streamlined blades, depth of which exceeds 3/4 inch spacing. Provide spring tension or other device to set blades. Provide units with horizontal face.
- B. Provide 1-1/4 inch margin frame with countersunk screw holes.
- C. Fabricate of steel with 20 gauge minimum frames and 22 gauge minimum blades, steel and aluminum with 20 gauge minimum frame, or aluminum extrusions.

- D. Provide exhaust grilles, where not individually connected to exhaust fans, with integral, gang operated opposed blade dampers with removable key operator, operable from face.

2.10 CEILING SUPPLY DIFFUSER

- A. Diffusers shall be square or rectangular as shown on H.V.A.C. drawings.
- B. Diffusers shall have lay-in panel frame type appropriate to ceiling.
- C. Fabricate of steel.
- D. Radial opposed blade damper and multi-louvered equalizing grid with damper adjustable from diffuser face.
- E. Diffusers shall be assembled in patterns which provide one, two, three or four way air discharge with each side delivering the quantity of air specified on the H.V.A.C. drawings.
- F. Diffusers shall be furnished and installed with square to round adaptors factory welded to diffusers, unless otherwise noted.

2.11 CEILING SLOT DIFFUSERS

- A. Continuous 3/4 inch wide slot, with adjustable vanes for left, right or vertical discharge.
- B. Fabricate of aluminum extrusions.
- C. Fabricate one (1) margin frame with concealed support clips for T bar mounting and gasket, mitered end border.

2.12 DUCT SLEEVES AND PREPARED OPENINGS

- A. Duct Sleeves and Closure Collars: Fabricate from minimum 20 gauge galvanized steel.
 - 1. Where sleeves are installed in bearing walls, provide structural steel sleeves.
- B. Prepared Openings: Provide 1 inch clearance between the duct and the sleeve.

2.13 DEFLECTORS

- A. Factory fabricated and factory or field assembled units consisting of curved turning vanes for uniform air distribution and change of direction with minimum turbulence and pressure loss.
- B. Provide curved vanes for square elbows.
- C. For round ducts taking off from rectangular ducts, provide factory fabricated, galvanized sheet metal, spin-in fittings. These fittings shall have conical connections, butterfly dampers and locking quadrant operators.

2.14 ACCESS DOORS

- A. Weld door frame in place.
- B. Door shall be rigid and airtight with neoprene gaskets and two (2) or more steel hinges and tension fasteners.
- C. Provide doors as large as practical.
- D. Mount doors, if possible, so that air pressure holds them closed.
- E. Provide Access Doors at all Automatic Damper Locations.

2.15 DAMPERS

- A. Construct dampers with 2 gauges heavier than ducts in which installed.
- B. Except as modified herein, the construction shall be of aluminum or galvanized steel with interlocking edges and maximum 6" blade width. Conform with SMACNA HVACDCS. Dampers shall be opposed blade type.
- C. Backdraft Dampers (gravity dampers or shutters):
 - 1. Factory fabricated, with statically and dynamically balanced blades that open automatically when the fan starts and close by gravity when the fan stops.
 - 2. Provide the edges of the blades with felt or rubber strips to prevent rattling.
- D. Manual Volume Dampers:
 - 1. Balancing, factory fabricated type.
 - 2. Equip dampers with accessible mechanism such as quadrant operators or 3/16 inch rods brought through the side of ducts with locking setscrew and bushing.
 - 3. Where quadrant operators are used, they shall be chrome plated or enamel painted with all exposed edges rounded.
- E. Automatic Dampers:
 - 1. Refer to Section 15950: Controls and Instrumentation.
 - 2. Allow maximum leakage of 10 cfm per square foot of damper face area at 2 inch WG pressure difference.

2.16 FLUE REQUIREMENTS - GAS-FIRED EQUIPMENT

- A. Water Heaters: Furnish and install Selkirk Metalbestos, or approved equal, Type "B" flues from unit, up through roof (4'-0" minimum) to flue cap.
- B. Unit Heaters: Furnish and install Selkirk Metalbestos, or approved equal, Type "B" flues from unit, up through roof (4'-0" minimum) to flue cap.
- C. All Flues Shall Be Installed According to the Manufacturer's Installation Instruction and Shall Comply with the Following Additional Codes or Standards:
 - 1. National Safety Standards.
 - 2. State Building Codes.
 - 3. State and local Fire Department Codes.

4. City and Local Codes and Standards.
5. ANSI/ASTM A167 - Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
6. ANSI/ASTM A525 - Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, General Requirements.
7. ANSI Z223.1 (NFPA 54) - The National Fuel Gas Code.1
8. ASHRAE - Handbook, Equipment Volume, Chapter "Chimney, Gas, Vent, and Fireplace Systems."
9. ASTM A527 - Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip process, Lock-Forming Quality.
10. ASTM A569 - Steel, Sheet and Strip, Carbon (0.15 Maximum Percent) Hot-Rolled Commercial Quality.
11. NFPA 21 - Standard for Chimneys, Fireplaces, Vents, and Solid Fuel-Burning Appliances.
12. SMACNA - HVAC Duct Construction Standards - Metal and Flexible.
13. UL 103 - Standard for Factory Built Low heat Chimneys.
14. UL 441 - Standard for Gas Vents.

D. Support all flues a maximum of 24" below roof.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Installation shall conform to NFPA 90A, SMACNA HVACDCS.
- B. Mount units on factory built roof mounting frame providing watertight enclosure to protect ductwork and utility services. Install roof mounting frame level.
- C. Provide Mounting and Supporting of Ductwork and Accessories Including, but Not Limited To:
 1. Structural supports.
 2. Hangers.
 3. Vibration isolators.
 4. Stands.
 5. Clamps and brackets.
 6. Access doors.
 7. Dampers.
- D. Use electrical isolation between dissimilar metals. Electrical isolation may be fluorinated elastomers or sponge-rubber gaskets.
- E. Install ductwork accessories in accordance with the manufacturer's printed instruction.
- F. Allow clearance for inspection, repair, replacement and service.
- G. When air distribution systems are operated, there shall be no chatter, vibration or dust marks.
- H. Field Changes to Ductwork:
 1. Those required to suit the sizes of factory fabricated equipment actually furnished, shall be designed to minimize expansion and contraction.

2. Use gradual transitions in field changes as well as modifications to connecting ducts.

I. Dampers:

1. When installed on ducts to be thermally insulated, equip each damper-operator with stand-off mounting brackets, bases or adapters to provide clearance between the duct and operator not less than the thickness of insulation. Stand-off mounting items shall be integral with the operator or standard accessory of damper manufacturer.
2. Install yellow surveyor's tape at all volume dampers located above suspended ceilings. Tapes shall hang from volume dampers down to a height of 1'-0" above the ceiling.

J. Deflectors:

1. Provide in square elbows, duct-mounted supply outlets, takeoff or extension collars to supply outlets and tap-in branch-off connections.
2. Adjust supply outlets to provide air volume and distribution as indicated or specified.

- K. Access Doors: Provide for automatic dampers, fire dampers, coils, thermostats, temperature controllers, valves, filters and other concealed apparatus requiring service and inspection in the duct systems.

L. Duct Sleeves and Prepared Openings:

1. Install for duct mains, duct branches and ducts passing through roofs and ceilings.
2. The Contractor shall be responsible for the proper size and location of sleeves and prepared openings.
3. Duct Sleeves: Allow 1 inch clearance between duct and sleeve or 1 inch clearance between insulation and sleeve for insulated ducts, except at grilles, registers and diffusers.
4. Prepared Openings: Allow 1 inch clearance between duct and opening or 1 inch clearance between insulation and opening for insulated ducts, except at grilles, registers and diffusers.

M. Closure Collars:

1. Provide not less than 4 inches wide on each side of walls or floors where sleeves or prepared openings are installed.
2. Fit collars snugly around ducts and insulation.
3. Grind smooth edges of collar to preclude tearing or puncturing insulation covering or vapor barrier.
4. Use nails with maximum 6 inch centers on collars.

N. Packing:

1. Fed. Spec. HH-I-1030.
2. Pack with mineral fiber in spaces between sleeve or opening and duct or duct insulation.

O. Duct Hangers and Supports:

1. SMACNA HVACDCS, Section 4.
2. Unless otherwise indicated, provide not less than two 1 inch by 1/16 inch galvanized strap-iron hangers spaced one on each side of duct.

3. Anchor risers in the center of the vertical run to allow ends of riser free vertical movements.
4. Attach supports only to structural framing members and concrete slabs.
5. Attach only to top chord of bar joists. Do not anchor supports to metal decking unless a means is provided and approved for preventing the anchors from puncturing the metal decking.
6. Where supports are required between structural framing member, provide suitable intermediate metal framing.
7. Where C clamps are used, use retainer clips.
8. Flexible Ducts:
 - a. Support ducts by hangers every 3 feet.
 - b. Use stretch flexible air ducts to smooth out corrugations, and long radius elbows, where possible, using a maximum length of 5'-0" to make connections to Supply Diffusers Only.
9. Flexible Connectors:
 - a. Provide flexible connectors between fans and ducts or casings and where ducts are of dissimilar metals.
 - b. For round ducts, securely fasten flexible connectors by zinc coated steel clinch type draw-bands.
 - c. For rectangular ducts, lock flexible connectors to metal collars.

P. Inspection Plates and Test Holes:

1. Provide, where required, in ductwork or casings for all balance measurements.
2. Test holes shall be factory fabricated, airtight and noncorrosive with screw cap and gasket. Extend cap through insulation.

Q. Drain (Drip) Pans, Drain Connections and Drain Lines:

1. Provide coils with drain and drain connections.
2. Where coils are sectionalized, with one section above the other, install intermediate drain pans. There shall be no entrainment of water in airstream.
3. Drain condensate from drain pans to the nearest disposal points as indicated.
4. Equip drain lines with copper U-traps and a seal height 1 inch greater than the maximum static pressure rating of the fan system.
5. Ensure pans drain completely under all operating conditions.

R. Openings:

1. Provide openings in ductwork where required to accommodate thermometers and controllers.
2. Provide pilot tube openings where required for testing of systems, complete with metal can with spring device or screw to ensure against air leakage.
3. Where openings are provided in insulated ductwork, install insulation material inside a metal ring.

S. Cleaning:

1. Clean duct system and force air at high velocity through duct to remove the accumulated dust. To obtain sufficient air, clean half the system at a time. Protect equipment which may be harmed by excessive dirt with filters or bypass during cleaning.

2. Clean duct systems with high power vacuum machines. Protect equipment which may be harmed by excessive dirt with filters or bypass during cleaning. Provide adequate access into ductwork for cleaning purposes.
- T. Locate ducts with sufficient space around equipment to allow normal operating and maintenance activities.
- U. Connect diffusers or troffer boots to low pressure ducts with 5 feet maximum length of flexible duct. Hold in place with strap or clamp.
- V. At each point where ducts pass through partitions, seal joints around duct with non combustible material.

3.02 FIELD TESTS AND INSPECTIONS

- A. The Contractor is responsible for the administration and direction of tests. Testing is to be performed in the presence of Shaw's Representative.
- B. Furnish instruments, equipment, connecting devices and personnel for the tests.
- C. Notify Architect 10 days before inspection testing is scheduled.
- D. Correct all defects in the work.
- E. Repeat tests until the work is in compliance.
- F. Performance Testing and Balancing: Section 15990, Testing and Balancing Air Systems.

3.03 AIR CLEANING DEVICES

- A. Refer to Filter Section 15885 for exact requirements.

3.04 EXAMINATION

- A. Verify that roof is ready to receive work and opening dimensions are as indicated on Shop Drawings.
- B. Verify that proper power supply is available.

3.05 MANUFACTURER'S FIELD SERVICES

- A. Provide initial start-up, service and maintenance during first year of operation, including routine servicing and checkout. Refer to this and other sections of this Building Design Criteria for additional requirements.

END OF SECTION

SECTION 15950

CONTROLS AND INSTRUMENTATION

PART 1 - GENERAL

1.01 REFERENCES

- A. Refer to other Divisions of these Specifications, other Sections in this Division, and Drawings for related work which may effect the work of this Section.
- B. The Contractor Drawings indicate and show limits of construction for this project. These Specifications specify material and work requirements for this project. Both are complimentary to each other, and both shall be followed to properly complete the work.

1.02 RELATED WORK UNDER OTHER SECTIONS

- A. Division 16 - Electric (see drawings).

1.03 SERVICE AND GUARANTEE

- A. After completion of the installation, the system shall be left in complete satisfactory operating condition subject to the approval of the Heating, Ventilating and Air Conditioning Engineer and Owner.
- B. The equipment herein specified shall be free from defects in workmanship and material under normal use and service. If, within twelve (12) months from the date of acceptance by the Heating, Ventilating and Air Conditioning Engineer and Shaw's the equipment herein described is proved to be defective in workmanship or material, it will be adjusted, repaired, or replaced free of charge by this Contractor.

PART 2 - PRODUCTS

2.01 AUTOMATIC DAMPERS

- A. All automatic dampers shall be of the opposed blade type, Two (2) position dampers. All dampers shall have sixteen (16) gauge galvanized steel frames. Blades shall be sixteen (16) gauge galvanized steel edges. Blade width shall not exceed six (6") inches. Bearings shall be one-half (1/2") inch nylon.
- B. All automatic dampers shall have a complete vent seal, on blade edges, frame top, bottom and sides. Dampers shall be Greenheck, Series VCD-23, opposed blade type, or approved equal. Dampers shall conform to SMACNA Standards.

2.02 DAMPER MOTORS

- A. Damper motors shall be capable of opening and closing the low leakage, opposed blade dampers indicated.

- B. Damper motors shall be the direct coupled type, BELIMO, or approved equal.
- C. Damper motor voltage shall be 120-1-60 unless otherwise indicated in related Sections.
- D. Contactors shall be furnished and installed by the Electrical Contractor, if required.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Refer to Shaw's current FMS system specifications for equipment controlled by FMS.
- B. Refer to electrical drawings and specifications for equipment controlled by the Electrical Contractor.
- C. Responsibilities of the HVAC Contractor:
 - 1. The HVAC Contractor shall furnish and install all automatic dampers, damper linkage and damper motors as indicated on HVAC drawings and specifications.
 - 2. Refer to other Sections of these specifications and Drawings for related work which may effect the work of this Section.
 - 3. Be responsible for furnishing equipment compatible with the Owner's FMS system and equipment controlled by the Electrical Contractor.
 - 4. Coordinating all HVAC work with the FMS Installer and the Electrical Contractor to assure proper operating systems.
 - 5. Be fully responsible for the proper operation of all HVAC equipment installed by the HVAC Contractor.
- D. Automatic Damper Operation Shall Be Furnished and Installed to Operate as Follows:
 - 1. Kennel shop toilet exhaust fan motorized damper shall be interlocked with toilet room light. Damper shall open when light switch is on. Damper actuator shall be spring return type, set to fail in closed position. Damper shall be provided with an end switch which shall energize the fan when the motorized damper is fully open.

END OF SECTION

SECTION 15990

TESTING AND BALANCING AIR SYSTEMS

PART 1 - GENERAL

1.01 BALANCING

- A. Shaw's shall provide balancing services.
- B. Upon completion, the entire system shall be balanced to maintain temperature within 1-1/2 deg F throughout the conditioned areas with sustaining velocities not to exceed fifty (50') feet per min. at the five (5') foot level.
- C. The Balancing Contractor for the HVAC system will be selected and paid for by Shaw's. The General Contractor/HVAC Contractor is responsible for scheduling and providing all support required by Shaw's Balancing Contractor. This will not violate any warranties required from the General/HVAC Contractors.
- D. Testing, Adjusting and Balancing Procedure:
 - 1. The Balancing Contractor under the supervision of the HVAC Contractor shall have all dampers, etc., set as follows: All supply and return air dampers are set in full open position. All diffuser and side wall register dampers and all extractors are set in full open position.
 - 2. HVAC Contractor shall assure that all systems are complete and under full operating control as per design and shall assure that sufficient time is allowed prior to proper completion date for the proper performance of the testing, adjusting and balancing, by the Balancing Contractor.
- E. Testing Procedure:
 - 1. Test and record motor amperes.
 - 2. Make pitot traverse of all main supply ducts and obtain design cfm at fans.
 - 3. Test and record system static pressure, suction and discharge.
 - 4. Test and adjust system for design recirculated air, cfm.
 - 5. Test and adjust system for design outside air, cfm.
 - 6. Test and Record Entering Air Temperature: Dry bulb heating and cooling, wet bulb cooling.
 - 7. Test and record leaving air "temperatures" dry bulb heating and cooling, wet bulb cooling.
 - 8. Adjust all main supply and return air ducts to proper design cfm.
 - 9. Adjust all zones to proper design cfm.
 - 10. Test and adjust each diffuser and register to within 10% of design requirements.
 - 11. Identify each diffuser, register and grille as to location and area.
 - 12. Furnish complete written report of final balance.
- F. Within two weeks of completion of air balancing, the Balancing Contractor shall compile the following data for each system insofar as they apply and shall include it on the final submittal.
 - 1. Fan Descriptive Data:

- a. System number.
 - b. Location served.
 - c. Fan location.
 - d. Fan size.
 - e. Fan make.
 - f. Fan horsepower.
2. Fan Design and Delivered Conditions:
- a. Fan rpm.
 - b. Total and/or external static pressure.
 - c. Cfm supply.
 - d. Cfm exhaust.
3. System Design and Delivered Conditions:
- a. Each outlet shall be identified as to location and area.
 - b. Register or diffuser size.
 - c. Register or diffuser factor.
 - d. Design cfm.
 - e. Design fpm.
 - f. Final fpm reading.
 - g. Final cfm.
 - h. Outlet manufacturer and type.
 - i. Type of instrument and method used.

G. The Balancing Contractor Shall Distribute Final Submittals as Follows:
Architect for review

The Architect's 8 stamped copies shall be distributed as follows:
3 copies to the mechanical contractor to be included in the O/M Manual
1 copy to George Aloupis
1 copy to the General Contractor
Mechanical Contractor
1 copy for the Architect's records

- H. The Balancing Contractor shall set all dampers of all types for proper air flow taking care not to "choke" the system. No system which has all its register volume control dampered causing objectionable air noise will be acceptable. All hand volume dampers shall be marked by the Balancing Contractor at their final position.
- I. The Balancing Contractor shall provide all instruments and accessories required to perform the tests including velometer, anemometer, pitot tube, manometer, ammeter, voltmeter, tachometer, etc., and shall make their own provisions for inserting the instruments. The HVAC Contractor shall patch all test holes in an approved manner.
- J. The General Contractor is responsible for scheduling and providing all support required by the Balancing Contractor including man-lifts as required. This will not violate any warranties required from the General/HVAC Contractors.
- K. The HVAC Contractor shall have a representative available on site during the second day of testing and balancing to correct any deficiencies that are found by the Balancing Contractor. The HVAC Contractor and the Balancing Contractor shall coordinate their schedules to ensure that this occurs.

- L. All existing and new HVAC system shall be balanced. Refer to Contract Drawings for airflow quantities, including HVAC unit minimum outside air.

END OF SECTION

Architects + Engineers

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