

Alpine Engineered Products, Inc.

1950 Marley Drive Haines City, FL 33844

Florida Engineering Certificate of Authorization Number: 567

Florida Certificate of Product Approval # FL1999

Page 1 of 1 Document ID:1SZ1487-Z0119152455

Truss Fabricator: Anderson Truss Company
Job Identification: 6-272--Little & Williams People's State Bank -- , **
Truss Count: 37
Model Code: Florida Building Code 2004
Truss Criteria: ANSI/TPI-2002(STD)/FBC
Engineering Software: Alpine Software, Versions 7.24, 7.25.
Structural Engineer of Record: The identity of the structural EOR did not exist as of
Address: the seal date per section 61G15-31.003(5a) of the FAC
Minimum Design Loads: Roof - 50.0 PSF @ 1.25 Duration
Floor - N/A
Wind - 110 MPH ASCE 7-02 -Closed



Seal Date: 07/19/2006

-Truss Design Engineer-
James F. Collins Jr.

Florida License Number: 52212
1950 Marley Drive
Haines City, FL 33844

Notes:

1. Determination as to the suitability of these truss components for the structure is the responsibility of the building designer/engineer of record, as defined in ANSI/TPI 1
2. The drawing date shown on this index sheet must match the date shown on the individual truss component drawing.
3. As shown on attached drawings; the drawing number is preceded by: HCUSR487

Details: BRCLBSUB-GBLLETIN-A11030EE-A11015EE-

#	Ref	Description	Drawing#	Date
1	25827--A1		06200018	07/19/06
2	25828--A2		06200019	07/19/06
3	25829--A3		06200020	07/19/06
4	25830--A4		06200021	07/19/06
5	25831--A5		06200022	07/19/06
6	25832--A6		06200023	07/19/06
7	25833--A7		06200024	07/19/06
8	25834--A8		06200025	07/19/06
9	25835--A9		06200004	07/19/06
10	25836--B1		06200001	07/19/06
11	25837--B2		06200011	07/19/06
12	25838--B3		06200017	07/19/06
13	25839--B4		06200026	07/19/06
14	25840--B5		06200030	07/19/06
15	25841--B6		06200034	07/19/06
16	25842--B7G		06200007	07/19/06
17	25843--C1-GE		06200015	07/19/06
18	25844--C2		06200016	07/19/06
19	25845--C3		06200036	07/19/06
20	25846--C4G		06200037	07/19/06
21	25847--D1		06200008	07/19/06
22	25848--D2		06200028	07/19/06
23	25849--HJ9		06200029	07/19/06
24	25850--EJ9		06200033	07/19/06
25	25851--EJ9A		06200027	07/19/06
26	25852--HJ7		06200002	07/19/06
27	25853--EJ7		06200006	07/19/06
28	25854--HJ5		06200009	07/19/06
29	25855--EJ5		06200012	07/19/06
30	25856--EJD		06200013	07/19/06
31	25857--J7		06200031	07/19/06
32	25858--J5		06200032	07/19/06
33	25859--J3		06200010	07/19/06
34	25860--J1		06200005	07/19/06
35	25861--K1-GE		06200035	07/19/06
36	25862--K2		06200014	07/19/06

#	Ref	Description	Drawing#	Date
37	25863--K3G		06200003	07/19/06

SHOP DRAWING REVIEW

- ☐ NO EXCEPTIONS TAKEN
☒ REVIEWED AS NOTED
☐ REJECTED:REVISE AND RESUBMIT
☐ RETURN CORRECTED COPY

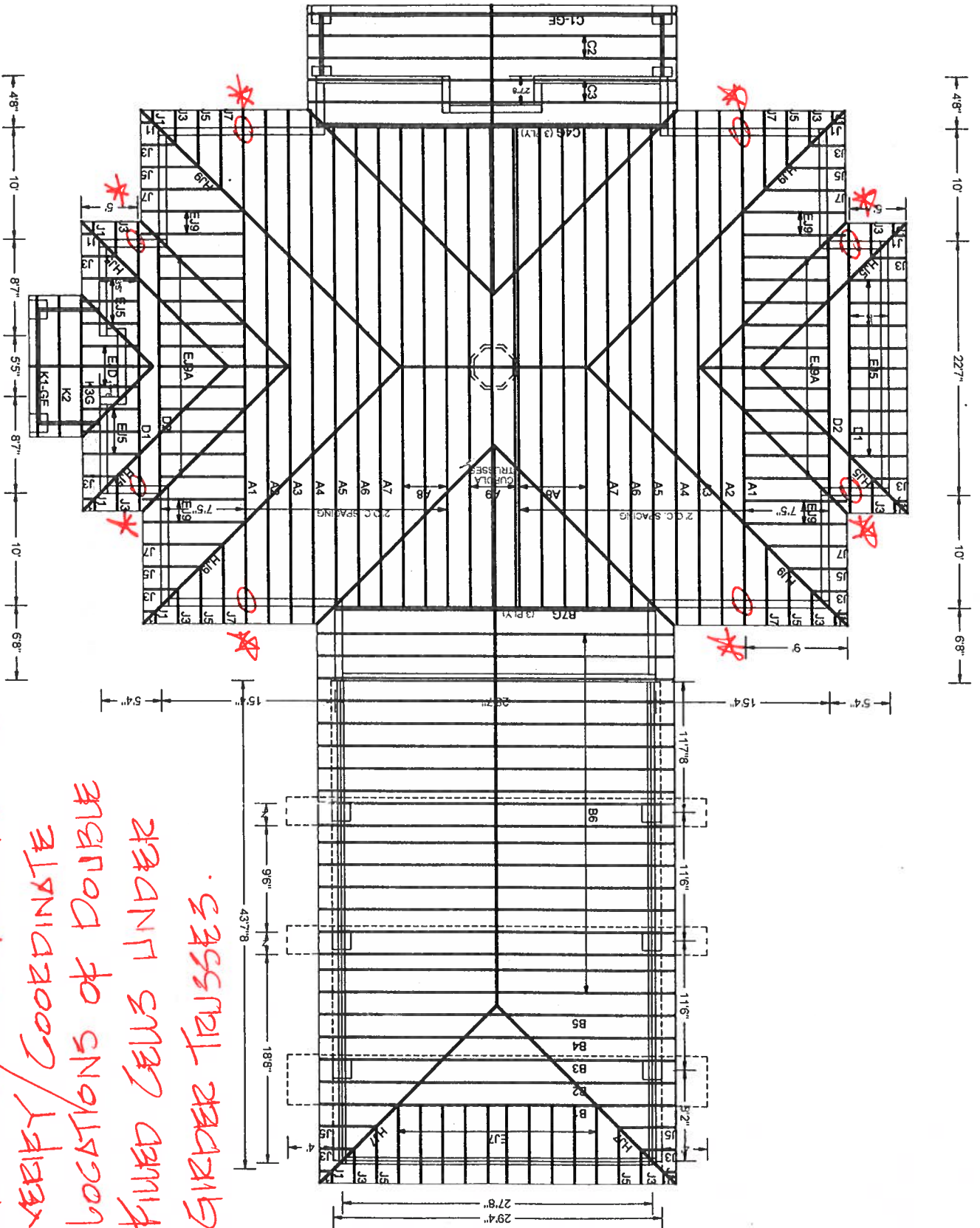
This review is only for general conformance with the design concept of the project and general compliance with the information given in the Contract Documents. Corrections or comments made on the shop drawings during this review do not relieve contractor from compliance with the requirements of the plans and specifications. Approval of a specific item shall not include approval of an assembly of which the item is a component. Contractor is responsible for: dimensions to be confirmed and correlated at the job site; information that pertains solely to the fabrication processes or to the means, methods, techniques, sequences and procedures of construction; coordination of his or her Work with that of all other trades; and for performing all work in a safe and satisfactory manner.

DATE 07/25/06 BY 36



#6-272 LITTLE & WILLIAMS - PEOPLES STATE BANK

7/14/06



* GENERAL CONTRACTOR TO
VERIFY/COORDINATE
LOCATIONS OF DOUBLE
PILED CELLS UNDER
GIRDER TRUSSES.

Top chord 2x6 SP #2 :T2, T3 2x8 SP SS:
Bot chord 2x8 SP SS
Webs 2x4 SP #3 :W4, W14 2x4 SP #2 Dense:

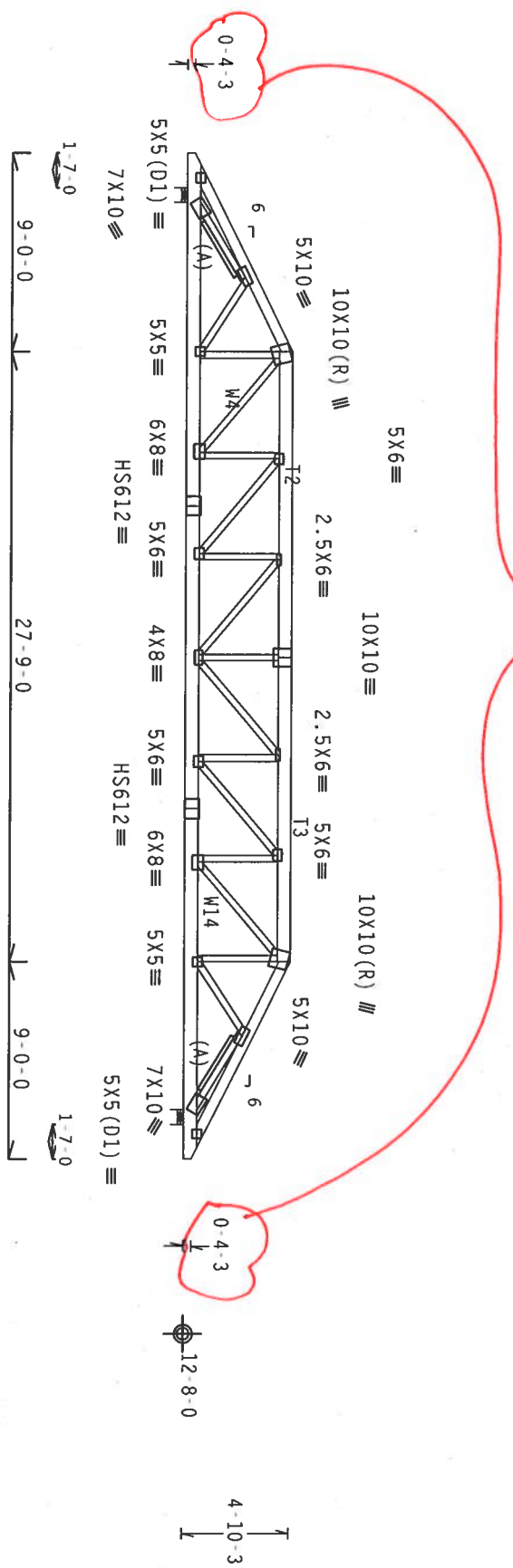
Calculated horizontal deflection is 0.11" due to live load and 0.19" due to dead load.

In lieu of structural panels or rigid ceiling use purlins to brace TC @ 24" OC, BC @ 24" OC.

Deflection meets L/360 live and L/240 total load. Creep increase factor for dead load is 1.50.

VERIFY WITH ARCHIT

110 mph wind, 15-26 ft mean hgt, ASCE 7-02, CLOSED bldg, located anywhere in roof, CAT III OR IV, EXP B, wind TC DL=5.0 psf, wind BC DL=5.0 psf.
(A) 2x8 SP #3 or better "T" brace. 80% length of web member. Attach with 16d box or Gun (0.135"x3.5", min.) nails @ 6" OC.
#1 hip supports 9-0-0 jacks W/2 panel TC and no end vert.
WARNING: Furnish a copy of this DWG to the installation contractor. Special care must be taken during handling, shipping and installation of trusses. See "WARNING" note below.



9-0-0 27-9-0 9-0-0
1-7-0 1-7-0
R-5046 U-575 W-8" 45-9-0 Over 2 Supports R-5046 U-575 W-8"

PLT TYP. 20 Gauge HS.Wave Design Crit: TPI-2002(STD)/FBC Cq/RT=1.00(1.25)/10(0) 7.24.1230 QTY:2 FL-/7-/1-/R/- Scale = .125"/ft.

WARNING: TRUSSES REQUIRE EXTREME CARE IN FABRICATION, HANDLING, SHIPPING, INSTALLING AND BRACING. REFER TO BC31-1-03 (BUILDING COMPONENT SAFETY INFORMATION), PUBLISHED BY TPI (TRUSS PLATE INSTITUTE), 583 MADISON, WISCONSIN, 53501-2000, FOR DETAILED INSTRUCTIONS. UNLESS OTHERWISE INDICATED, TOP CHORD SHALL HAVE PROPERLY ATTACHED STRUCTURAL PANELS AND BOTTOM CHORD SHALL HAVE A PROPERLY ATTACHED RIGID CEILING.

IMPORTANT: FURNISH A COPY OF THIS DESIGN TO THE INSTALLATION CONTRACTOR. ALPINE ENGINEERED PRODUCTS, INC. SHALL NOT BE RESPONSIBLE FOR ANY DEVIATION FROM THIS DESIGN.

ALPINE
Alpine Engineered Products, Inc.
1950 Marley Drive
Haines City, FL 33844
Scale of: 1/8"=1'-0"
Cen # 567

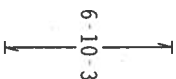


TC LL	24.0 PSF	REF	R487--	25827
TC DL	16.0 PSF	DATE	07/19/06	
BC DL	10.0 PSF	DRW	HCSR487	06200018
BC LL	0.0 PSF	HC-ENG	MNM/AP	
TOT.LD.	50.0 PSF	SEQN-	116135	
DUR.FAC.	1.25			
SPACING	24.0"	JRFF-	JSZ1487	201

110 mph wind, 16.26 ft mean hgt, ASCE 7-02, CLOSED bldg, not located within 6.50 ft from roof edge, CAT III OR IV, EXP B, wind TC DL=5.0 psf, wind BC DL=5.0 psf.

(A) 2x6 SP #3 or better "T" brace. 80% length of web member. Attach with 16d Box or Gun (0.135"x3.5",min.) nails @ 6" OC.

Deflection meets $L/360$ live and $L/240$ total load. Creep increase factor for dead load is 1.50.



Scale = .125"/Ft.

1230.17 QTY

ALPINE ENGINEERING

TRUSSES.

APPLY

AL ON THIS

OF THE

1

REF	R487 -	258229
DATE	07/19/06	
DDRW	HCUSR487	0620002
HC-ENG	MMW/AF	
SEQN -	115965	
REF -	1SZ1487	2011

REF	R487 -	25829
DATE	07/19/06	
DDRW	HCUSR487	0620002
HC-ENG	MMW/AF	
SEQN -	115965	
REF -	1SZ1487	2011

Top chord 2x4 SP #2 Dense
Bot chord 2x4 SP #2 Dense
Webs 2x4 SP #3

(B) 1x4 SP #3 or better "T" brace. 80% length of web member.
Attach with 8d Box or Gun (0.113"x2.5", min.) nails @ 6" OC.

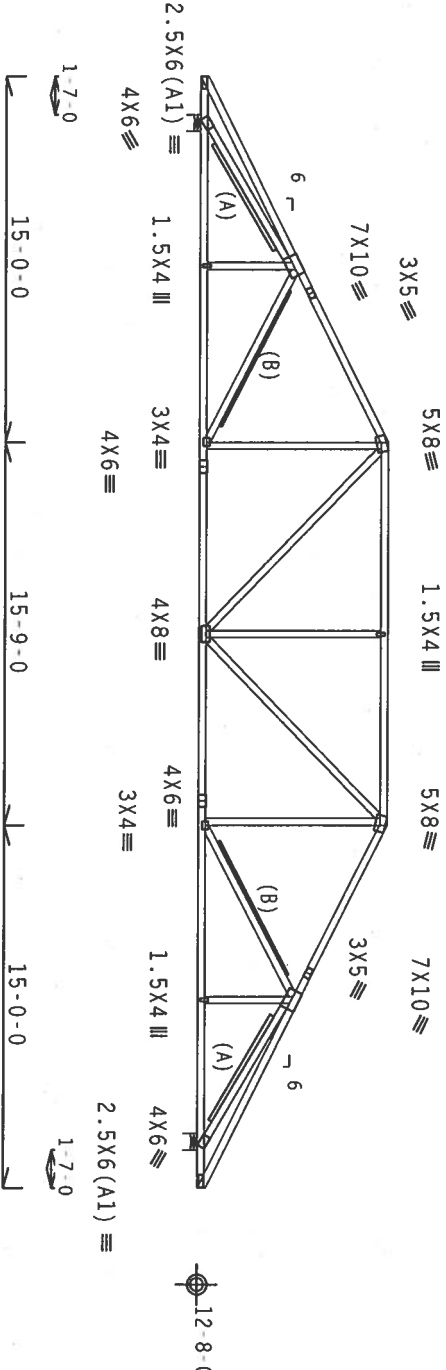
In lieu of structural panels or rigid ceiling use purlins to
brace TC @ 24" OC, BC @ 24" OC.

WARNING: Furnish a copy of this DWG to the installation
contractor. Special care must be taken during handling, shipping
and installation of trusses. See "WARNING" note below.

110 mph wind, 16.76 ft mean hgt, ASCE 7-02, CLOSED bldg, not
located within 6.50 ft from roof edge, CAT III OR IV, EXP B, wind
TC DL=5.0 psf, wind BC DL=5.0 psf.

(A) 2x8 SP #3 or better "T" brace. 80% length of web member.
Attach with 16d Box or Gun (0.135"x3.5", min.) nails @ 6" OC.

Deflection meets L/360 live and L/240 total load. Creep increase
factor for dead load is 1.50.



R-2374 U-288 W-8"

R-2374 U-288 W-8"

PLT TYP. Wave

Design Crit: TPI-2002(STD)/FBC
Cq/RT=1.00(1.25/10(0))

QTY: 2 FL/-7/-/R/-

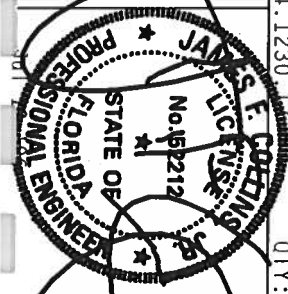
Scale = .125"/ft.

WARNING: TRUSSES REQUIRE EXTREME CARE IN FABRICATION, HANDLING, SHIPPING, INSTALLING AND BRACING.
REFER TO BEST PRACTICES (BOLTING COMPONENT SAFETY INFORMATION), PUBLISHED BY TPI (TRUSS PLATE INSTITUTE, 563
N. 10TH AVE., SUITE 200, FOND DU LAC, WI 54937) AND WFLA (FLORIDA TRUSS COUNCIL OF AMERICA, 6300 ENTERPRISE LN.,
MADISON, FL 32919) FOR TRUSS DESIGN, MANUFACTURING, AND ERECTION. THESE PRACTICES, UNLESS OTHERWISE INDICATED,
TOP CHORD SHALL HAVE PROPERLY ATTACHED STRUCTURAL PANELS AND BOTTOM CHORD SHALL HAVE A PROPERLY ATTACHED
RIGID CEILING.

IMPORTANT: FURNISH A COPY OF THIS DESIGN TO THE INSTALLATION CONTRACTOR.
PRODUCTS, INC. SHALL NOT BE RESPONSIBLE FOR ANY DETAILING FROM THIS DESIGN. ALPINE ENGINEERING
DESIGN CONFORMS WITH APPLICABLE PROVISIONS OF NDS (NATIONAL DESIGN SPEC. BY AREA) AND TPI.
CONNECTOR PLATES ARE MADE OF 20/18/16GA (W/H/S/K) ASTM A653 GRADE 40/60 (W, K/H/S) GALV. STEEL. APPLY
PLATES TO EACH FACE OF TRUSS AND, UNLESS OTHERWISE LOCATED ON THIS DESIGN, POSITION PER DRAWINGS 160A-Z.
ANY INSPECTION OF PLATES FOLLOWED BY (1) SHALL BE PER AMEX A3 OF TPI-2002 SEC. 3.3. A SEAL ON THIS
DRAWING INDICATES ACCEPTANCE OF PROFESSIONAL ENGINEERING RESPONSIBILITY SOLELY FOR THE TRUSS COMPONENT
DESIGN SHOWN. THE SUSTAINABILITY AND USE OF THIS COMPONENT FOR ANY BUILDING IS THE RESPONSIBILITY OF THE
BUILDING DESIGNER PER ANSI/TPI 1 SEC. 2.



Alpine Engineering Products, Inc.
1950 Marley Drive
Haines City, FL 33844
Scale of 1/4" = 1'-0"



TC DL	24.0 PSF	REF R487-- 25830
BC DL	16.0 PSF	DATE 07/19/06
HC DL	10.0 PSF	DRW HCUR487 06200021
BC LL	0.0 PSF	HC-ENG JB/AF
TOT. LD.	50.0 PSF	SEQN- 115971
DUR. FAC.	1.25	
COATING	24.0"	

DRG - 1S21A87 201

Top chord 2x4 SP #2 Dense
Bot chord 2x4 SP #2 Dense
Webs 2x4 SP #3

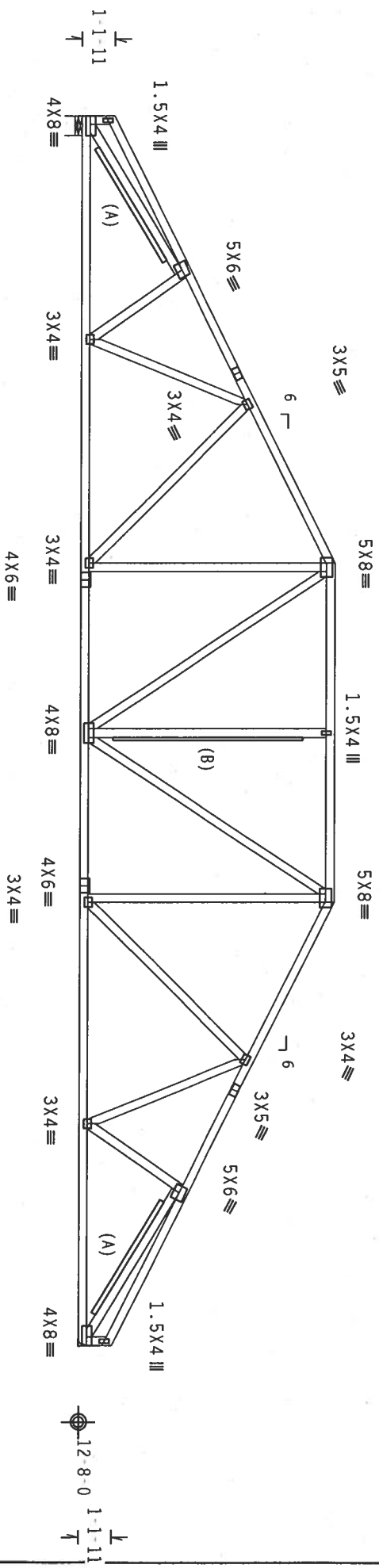
(B) 1x4 SP #3 or better "T" brace. 80% length of web member.
Attach with 8d Box or Gun (0.113"x2.5", min.) nails @ 6" OC.

In lieu of structural panels or rigid ceiling use purlins to
brace TC @ 24" OC, BC @ 24" OC.

110 mph wind, 17.66 ft mean hgt, ASCE 7-02, CLOSED bldg, not
located within 6.50 ft from roof edge, CAT III OR IV, Exp B, wind
TC DL=5.0 psf, wind BC DL=5.0 psf.

(A) 2x6 SP #3 or better "T" brace. 80% length of web member.
Attach with 16d Box or Gun (0.135"x3.5", min.) nails @ 6" OC.

Deflection meets L/360 live and L/240 total load. Creep increase
factor for dead load is 1.50.



15-5-0 11-9-0 15-5-0
42-7-0 Over 2 Supports
R-2210 U-287 W-8"

PLT TYP. Wave

Design Crit: TPI-2002(STD)/FBC
Cq/RT=1.00(1.25)/10(0)

QTY: 2 FL/-/7/-/R/-

Scale = 1/8" = 1.00' /ft.

WARNING TRUSSES REQUIRE EXTREME CARE IN FABRICATION, HANDLING, SHIPPING, INSTALLING AND BRACING.
REFER TO BCST 1-03 (BUILDING COMPONENT SAFETY INFORMATION), PUBLISHED BY TPI (TRUSS PLATE INSTITUTE), 583
MADISON AVE., SUITE 200, FARMINGTON, CT 06031, AND NCA (NATIONAL COUNCIL OF AMERICA, 6300 ENTERPRISE LN,
MADISON, ALA 37050) FOR ADDITIONAL INFORMATION. THESE TRUSSES ARE DESIGNED FOR THE FOLLOWING LOADS:
TOP CHORD SHALL HAVE PROPERLY ATTACHED STRUCTURAL PANELS AND BOTTOM CHORD SHALL HAVE A PROPERLY ATTACHED
RIGID CEILING.

IMPORTANT FURNISH A COPY OF THIS DESIGN TO THE INSTALLATION CONTRACTOR. ALPINE ENGINEERED
PRODUCTS, INC. SHALL NOT BE RESPONSIBLE FOR ANY DEVIATION FROM THIS DESIGN. ANY FAILURE IN THE TRUSS
DESIGN OR FABRICATION, HANDLING, SHIPPING, INSTALLING AND BRACING OF TRUSSES,
DESIGN CONFORMS WITH APPLICABLE PROVISIONS OF NDS (NATIONAL DESIGN SPEC. BY AIAA) AND TPI. ALPINE
CONNECTOR PLATES ARE MADE OF 2018/1664 (W/H/S/K) ASTM A653 GRADE 40/60 (W. K/H-S) GALV. STEEL. APPLY
PLATES TO EACH FACE OF TRUSS AND, UNLESS OTHERWISE LOCATED ON THIS DESIGN, POSITION PER DRAWINGS 160A-Z.
ANY INSPECTION OF PLATES FOLLOWED BY (1) SHALL BE PER ANNEX A3 OF TPI 2002 SEC.3. A SEAL ON THIS
DRAWING INDICATES ACCEPTANCE OF PROFESSIONAL ENGINEERING RESPONSIBILITY SOLELY FOR THE TRUSS COMPONENT
DESIGN SHOWN. THE SUITABILITY AND USE OF THIS COMPONENT FOR ANY BUILDING IS THE RESPONSIBILITY OF THE
BUILDING DESIGNER PER ANSI/TPI 1 SEC. 2.



TC LL	24.0 PSF	REF	R487 - 25831
TC DL	16.0 PSF	DATE	07/19/06
BC DL	10.0 PSF	DRW	HCUSR487 06200022
BC LL	0.0 PSF	HC-ENG	JB/AF
TOT. LD.	50.0 PSF	SEQN	115984
DUR. FAC.	1.25		
SPACING	24.0"		

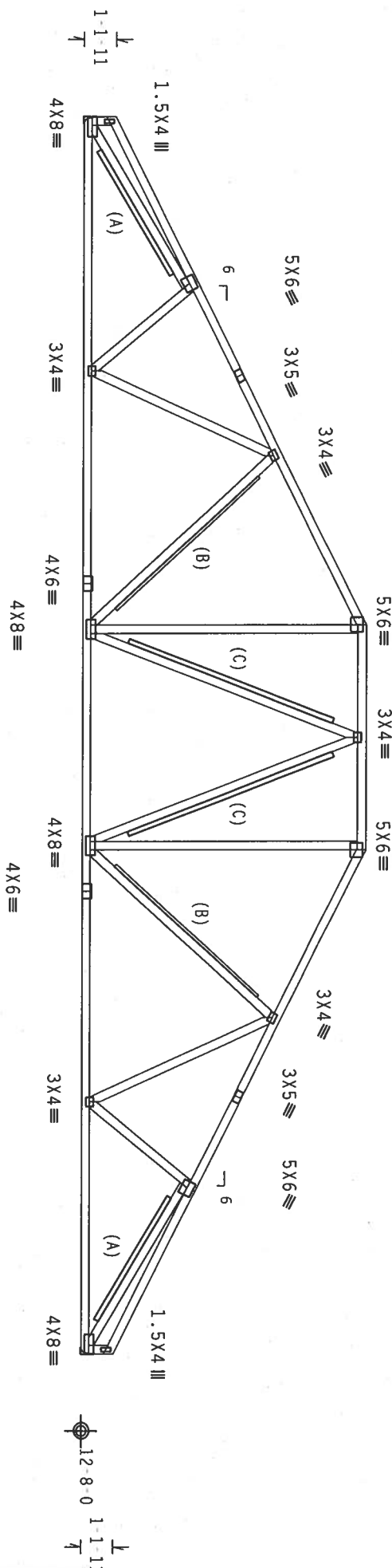
JRFF-1521/87 201

110 mph wind, 18.16 ft mean hgt, ASCE 7-02, CLOSED bldg, not located within 6.50 ft from roof edge, CAT III OR IV, Exp B, wind TC DL=5.0 psf, wind BC DL=5.0 psf.

(C) 2x4 SP #3 or better "T" brace. 80% length of web member. Attach with 16d Box or Gun (0.135"x3.5", min.) nails @ 6" OC.

In lieu of structural panels or rigid ceiling use purlins to brace TC @ 24" OC, BC @ 24" OC.

Deflection meets $L/360$ live and $L/240$ total load. Creep increase factor for dead load is 1.50.



Design Crit: TPI-2002(STD)/FBC
Cq/RT=1.00(1.25)

Scale = .1875"/Ft.

WARNING: TRUSSES REQUIRE EXPERT CARE IN FABRICATION, HANDLING, SHIPPING, INSTALLING AND BRACING. REFER TO BC51-1-03 (BUILDING COMPONENT SAFETY INFORMATION), PUBLISHED BY TPI (TRUSS PLATE INSTITUTE, 563 D'ONOFRIO DR., SUITE 200, MADISON, MI 48131) AND NCA (WOOD TRUSS COUNCIL OF AMERICA, 6500 ENTERPRISE LN., MADISON, MI 52719) FOR SAFETY PRACTICES APPLICABLE TO PERFORMING THESE FUNCTIONS. UNLESS OTHERWISE INDICATED, TOP CHORD SHALL HAVE PROPERLY ATTACHED STRUCTURAL PANELS AND BOTTOM CHORD SHALL HAVE A PROPERLY ATTACHED LIGID CEILING.

**** IMPORTANT ** FURNISH A COPY OF THIS DESIGN TO THE INSTALLATION CONTRACTOR**

TRUSS IN CONFORMANCE WITH TPI; OR FABRICATING, HANDLING, SHIPPING, INSTALLING & BRACING

DESIGN CONFORMS WITH APPLICABLE PROVISIONS OF NDS (NATIONAL DESIGN SPEC. BY AIAA) AND TPI. CONNECTOR PLATES ARE MADE OF 2014/16GA (M H/S/K) ASTM A553 GRADE 40/50 (M K/M S) CALY. ST

PLATES TO EACH FACE OF TRUSS AND, UNLESS OTHERWISE LOCATED ON THIS DESIGN, POSITION PER DE

ANY INSPECTION OF PLATES FOLLOWED BY (1) SHALL BE PER ANNEX A3 OF TP11-2002 SEC.3.

DRAWING INDICATES ACCEPTANCE OF PROFESSIONAL ENGINEERING RESPONSIBILITY SOLELY FOR THE DESIGN OF THE STRUCTURE AND NOT OF THE COMPONENTS FOR THE STRUCTURE.

DESIGN SHOWN. THE SUSTAINABILITY AND USE OF THIS COMPONENT FOR ANY BUILDING IS THE RESPONSIBILITY OF THE BUILDING DESIGNER PER ANSI/TPI 1 SEC. 2.

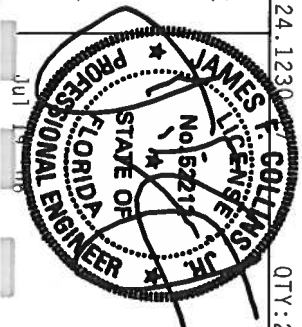


Alpine Engineered Products, Inc.
1950 Mariposa Drive
Haines City, FL 33844

Circle of 7 on # 567

Alpine Engineered Products, Inc.
1950 Marley Drive
Haines City, FL 33844
Circle of _____ on # 567

on # 567

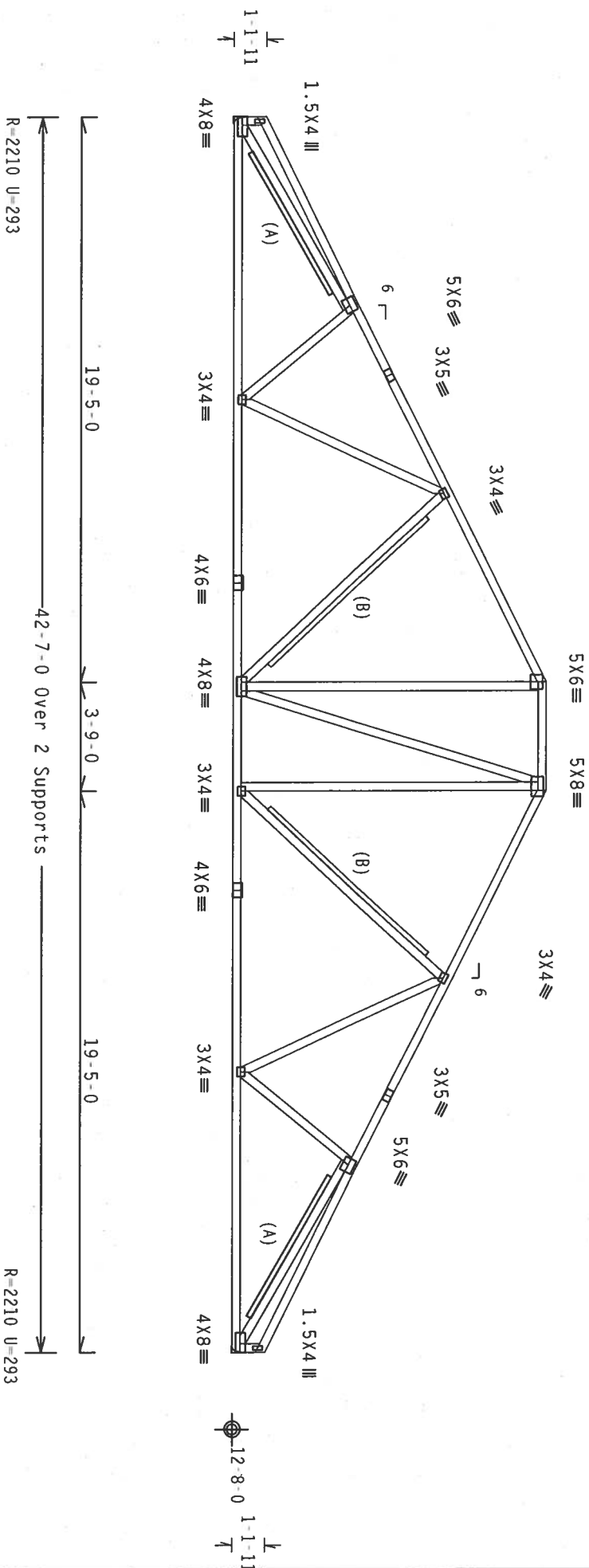


TC LL	24.0 PSF	REF	R487 - 25832
TC DL	16.0 PSF	DATE	07/19/06
BC DL	10.0 PSF	DRW	HCUSR487 06200023
BC LL	0.0 PSF	HC-ENG	JB/AF
TOT.LD.	50.0 PSF	SEQN-	115995
DUR.FAC.	1.25		
SPACING	24.0"	JREF-	1SZ1487 Z01

(B) 2x4 SP #3 or better "T" brace, 80% length of web member. Attach with 16d Box or Gun (0.135"x3.5", min.) nails @ 6" OC. In lieu of structural panels or rigid ceiling use purlins to brace TC @ 24" OC, BC @ 24" OC.

110 mph wind, 18.66 ft mean hgt, ASCE 7-02, C10SD bldg, not located within 6.50 ft from roof edge, Cat III or IV, Exp B, wind TC DL=5.0 psf, wind BC DL=5.0 psf.

(A) 2x6 SP #3 or better "T" brace. 80% length of web member. Attach with 16d Box or Gun (0.135"x3.5",min.) nails @ 6" OC. Deflection meets L/360 live and L/240 total load. Creep increase factor for dead load is 1.50.



Design Crit: TPI-2002(STD)/FBC
Cq/RT=1.00(1.25)

 $Cq/RT=1.00(1.25)/10(0)$

QTY:2 FL/-/7/-/-/R/-/-

Scale = .1875"/Ft.

WARNING FRASSES REQUIRE ERECTION, CALE IN FABRICATION, HANDLING, SHIPPING, INSTALLING AND BRACING. REFER TO GC51 1-0 (BUILDING COMPONENT SPEC INFORMATION), PUBLISHED BY TPI (FRASS PLANT INSTITUTE), 563 D'ONOFIO DR., SUITE 200, MADISON, WI 53719, AND WPCA (WOOD FRASS COUNCIL OF AMERICA, 6300 ENTERPRISE LN., MADISON, WI 53719) FOR SAFETY PRACTICES PRIOR TO PERFORMING THESE FUNCTIONS. UNLESS OTHERWISE INDICATED, TOP CHORD SHALL HAVE PROPERLY ATTACHED STRUCTURAL PANTS AND BOTTOM CHORD SHALL HAVE A PROPERLY ATTACHED RIGID CEILING.

IMPORTANT FURNISH A COPY OF THIS DESIGN TO THE INSTALLATION CONTRACTOR.

TRUSS IN CONFORMANCE WITH TPI: OR FABRICATING, HANDLING, SHIPPING, INSTALLING & BRACING

DESIGN CONFORMS WITH APPLICABLE PROVISIONS OF NDS (NATIONAL DESIGN SPEC. BY AIAA) AND TPI.

PLATES TO EACH FACE OF TRUSS AND UNLESS OTHERWISE LOCATED ON THIS DESIGN POSITION PER DRAWINGS 160A-2 CONNECTOR PLATES ARE MADE OF 20/18/16GA (M. H/S/K) ASIM A653 GRADE 40/60 (M. K/H/S) GALV. STEEL. APPLY

PLATES TO EACH FACE OF TRUSS AND, UNLESS OTHERWISE LOCATED ON THIS DESIGN, POSITION PER DRAWINGS 160A-2. ANY INSPECTION OF PLATES FOLLOWED BY (1) SHALL BE PERFORMED AS OF 1911-2002 SEC 3 A SEAL ON THIS

ANY INSPECTION OF PLATES FOLLOWED BY (1) SHALL BE PER ANNEX A3 OF TP11-2002 SEC.3. A SEAL ON THIS DRAWING INDICATES ACCEPTANCE OF PROFESSIONAL ENGINEERING RESPONSIBILITY SOLELY FOR THE TAUSE CONCRETE

DRAWING INDICATES ACCEPTANCE OF PROFESSIONAL ENGINEERING RESPONSIBILITY SOLELY FOR THE TRUSS COMPONENT

DESIGN SHOWN. THE SUITABILITY AND USE OF THIS COMPONENT FOR ANY BUILDING IS THE RESPONSIBILITY OF THE

BUILDING DESIGNER PER ANSI/TPI 1 SEC. 2.

CONSTITUTIONAL COURT

[illegible]

TC LL	24.0 PSF	REF	R487 - 25833
TC DL	16.0 PSF	DATE	07/19/06
BC DL	10.0 PSF	DRW	HCUSR487 06200024
BC LL	0.0 PSF	HC-ENG	JB/AF
TOT.LD.	50.0 PSF	SEQN-	116006
DUR.FAC.	1.25		
SPACING	24.0"	REF-	1S21487 201

JRFF - 1SZ1A87 Z01

—



Alpine Engineered Products, Inc.
1950 Hainey Drive
Haines City, FL 33844

Circle of ☐ on # 567

BUILDING DESIGNER PER ANSI/TPI 1 SEC. 2.2.

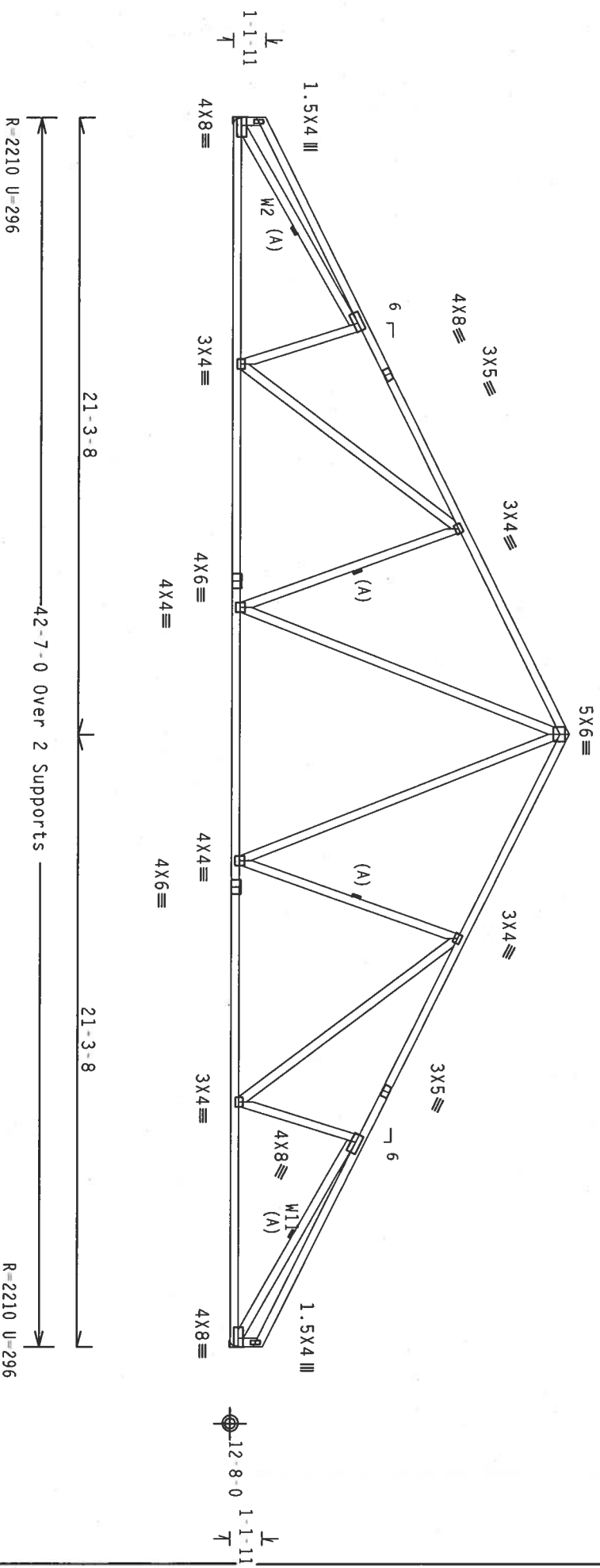
Top chord 2x4 SP #2 Dense
Bot chord 2x4 SP #2 Dense
Webs 2x4 SP #3 :W2, W11 2x4 SP #2 Dense:

(A) Continuous lateral bracing equally spaced on member.

Deflection meets L/360 live and L/240 total load. Creep increase factor for dead load is 1.50.

110 mph wind, 19.13 ft mean hgt, ASCE 7-02, CLOSED bldg, not located within 6.50 ft from roof edge, CAT III OR IV, Exp B, wind TC DL=5.0 psf, wind BC DL=5.0 psf.

In lieu of structural panels or rigid ceiling use purlins to brace TC @ 24" OC, BC @ 24" OC.



PLT TYP. Wave

Design Crit: TPI-2002(STD)/FBC
Cq/RT=1.00(1.25)/10(0)

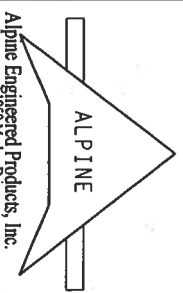
QTY: 7 FL/-/7/-/R/-

Scale = .1875"/ft.

****WARNING**** TRUSSES REQUIRE EXTREME CARE IN FABRICATION, HANDLING, SHIPPING, INSTALLING AND BRACING. REFER TO BC31.03 (BUILDING COMPONENT SAFETY INFORMATION), PUBLISHED BY TPI (TRUSS PLATE INSTITUTE, 583 DORCHESTER DR., SUITE 200, MADISON, WI 53719) AND MCA (WOOD TRUSS COUNCIL OF AMERICA, 6300 ENTERPRISE LN, DOWNSBORO, OH 43015) FOR TRUSS MANUFACTURING AND PERFORMING THESE FUNCTIONS. UNLESS OTHERWISE INDICATED, TOP CHORD SHALL HAVE PROPERLY ATTACHED STRUCTURAL PANELS AND BOTTOM CHORD SHALL HAVE A PROPERLY ATTACHED RIGID CEILING.

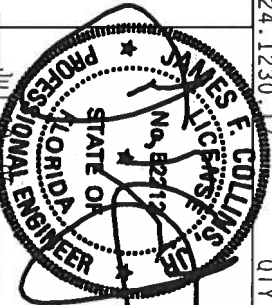
****IMPORTANT**** FURNISH A COPY OF THIS DESIGN TO THE INSTALLATION CONTRACTOR. ALPINE ENGINEERED PRODUCTS, INC. SHALL NOT BE RESPONSIBLE FOR ANY DEVIATION FROM THIS DESIGN.

PRODUCTS, INC. SHALL NOT BE RESPONSIBLE FOR ANY DEVIATION FROM THIS DESIGN. ANY FAILURE OF THE TRUSS IN CONFORMANCE WITH TPI OR FABRICATING, HANDLING, SHIPPING, INSTALLING & BRACING OF TRUSSES, DESIGN CONFORMS WITH APPLICABLE PROVISIONS OF NDS (NATIONAL DESIGN SPEC. BY AEP) AND TPI. ALPINE CONNECTOR PLATES ARE MADE OF 20/19/16GA (W/H/S/E) ASTM A653 GRADE 40/50 (W. K/H/S) GALV. STEEL. APPLY PLATES TO EACH FACE OF TRUSS AND, UNLESS OTHERWISE LOCATED ON THIS DESIGN, POSITION PER DRAWINGS 160A, Z. ANY INSPECTION OF PLATES FOLLOWED BY (1) SHALL BE PER ANNEX A3 OF TPI-2002 SEC.3. A SEAL ON THIS DRAWING INDICATES ACCEPTANCE OF PROFESSIONAL ENGINEERING RESPONSIBILITY SOLELY FOR THE TRUSS COMPONENT DESIGN SHOWN. THE SUITABILITY AND USE OF THIS COMPONENT FOR ANY BUILDING IS THE RESPONSIBILITY OF THE BUILDING DESIGNER PER ANSI/TPI 1 SEC. 2.



Alpine Engineered Products, Inc.
1950 Marley Drive
Haines City, FL 33844

Scale of 1/8" = 1'-0"



TC LL	24.0 PSF	REF	R487 - 25834
TC DL	16.0 PSF	DATE	07/19/06
BC DL	10.0 PSF	DRW	HCUSR487 06200025
BC LL	0.0 PSF	HC-ENG	JB/AF
TOT.LD.	50.0 PSF	SEQN	116034
DUR.FAC.	1.25		
SPACING	24.0"	JRFF	15Z1487 201

Top chord 2x4 SP #2 Dense :T2, T3 2x6 SP #1 Dense:
Bot chord 2x4 SP #2 Dense :W2, W15 2x4 SP #2 Dense:
Webs 2x4 SP #3 :W2, W15 2x4 SP #2 Dense:

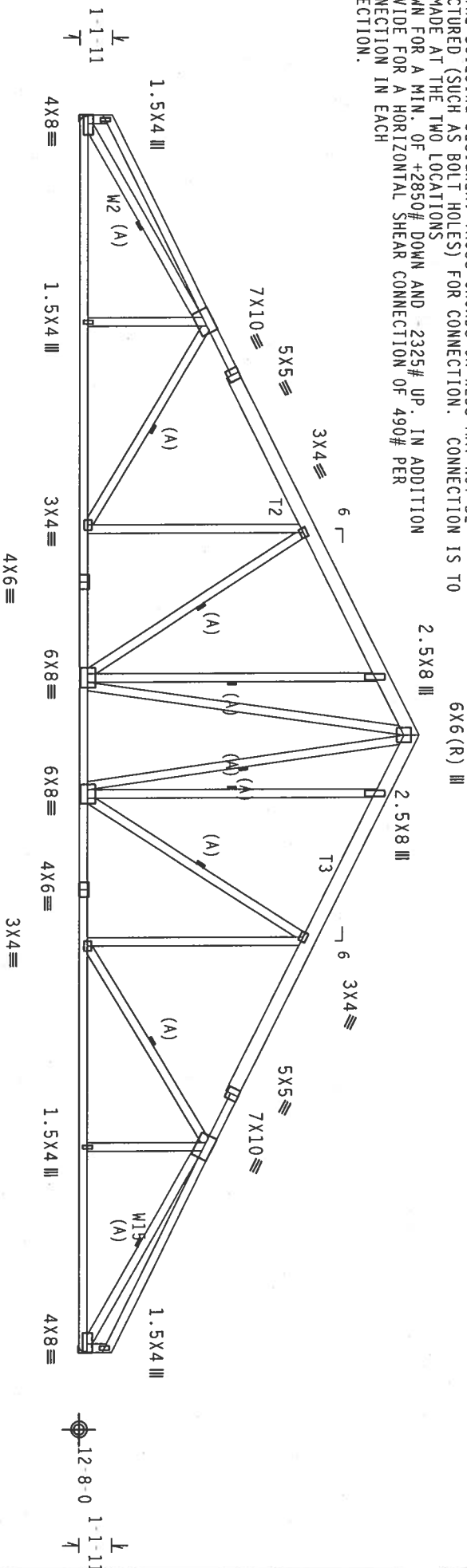
SPECIAL LOADS

(LUMBER DUR.FAC.=1.25 / PLATE DUR.FAC.=1.25)
TC - From 84 PLF at 0.00 to 84 PLF at 42.58
BC - From 20 PLF at 0.00 to 20 PLF at 42.58
TC - 90 LB Conc. Load at 21.29

Deflection meets L/360 live and L/240 total load. Creep increase factor for dead load is 1.50.

***THIS TRUSS IS DESIGNED TO CARRY A 350# STEEPLE. STEEPLE HAS A BASE OF 4'-0" 8x4-0-8 AND HEIGHT OF 9'-0-14. SUPPORTED BY THREE TRUSSES. CONNECTIONS ARE TO BE DESIGNED AND PROVIDED BY THE BUILDING DESIGNER. TRUSS CHORDS OR WEBS MAY NOT BE PUNCTURED (SUCH AS BOLT HOLES) FOR CONNECTION. CONNECTION IS TO BE MADE AT THE TWO LOCATIONS SHOWN FOR A MIN. OF +2850# DOWN AND -2325# UP. IN ADDITION PROVIDE FOR A HORIZONTAL SHEAR CONNECTION OF 490# PER CONNECTION IN EACH DIRECTION.

110 mph wind, 19.13 ft mean hgt, ASCE 7-02, CLOSED bldg, not located within 6.50 ft from roof edge, CAT III OR IV, Exp B, wind TC DL=5.0 psf, wind BC DL=5.0 psf.
(A) Continuous lateral bracing equally spaced on member.
In lieu of structural panels or rigid ceiling use purlins to brace TC @ 24" OC, BC @ 24" OC.
IT IS THE RESPONSIBILITY OF THE BUILDING DESIGNER AND TRUSS FABRICATOR TO REVIEW THIS DWG PRIOR TO CUTTING LUMBER TO VERIFY THAT ALL DATA, INCLUDING DIMENSIONS AND LOADS, CONFORM TO THE ARCHITECTURAL PLANS/ SPECIFICATIONS AND FABRICATOR'S TRUSS LAYOUT.



PLT TYP. Wave

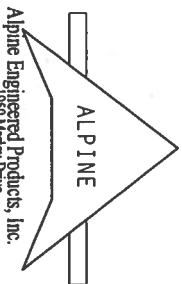
Design Crit: TPI-2002(STD)/FBC
Cq/RT=1.00(1.25)/10(0)

QTY: 3 FL/-/7/-/R/-

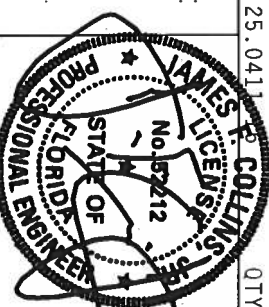
Scale = .1875"/ft.

WARNING TRUSSES REQUIRE EXTREME CARE IN FABRICATION, HANDLING, SHIPPING, INSTALLING AND BRACING. REFER TO BCST 1.03 (BUILDING COMPONENT SAFETY INFORMATION), PUBLISHED BY TPI (TRUSS PLATE INSTITUTE, 583 DORRHO DR., SUITE 200, MADISON, WI 53719) AND MICA (WOOD TRUSS COUNCIL OF AMERICA, 6500 ENTERPRISE LN, TORONTO, ONTARIO M3J 1P9) ON SAFETY PRACTICES PRIOR TO PERFORMING THESE FUNCTIONS. UNLESS OTHERWISE INDICATED, TOP CHORDS SHALL HAVE PROPERLY ATTACHED STRUCTURAL PANELS AND BOTTOM CHORD SHALL HAVE A PROPERLY ATTACHED RIGID CEILING.

IMPORTANT FURNISH A COPY OF THIS DESIGN TO THE INSTALLATION CONTRACTOR. ALPINE ENGINEERED PRODUCTS, INC. SHALL NOT BE RESPONSIBLE FOR ANY DEVIATION FROM THIS DESIGN. ANY FAILURE TO BUILD THE TRUSS IN CONFORMANCE WITH TPI OR FABRICATING, HANDLING, SHIPPING, INSTALLING & BRACING OF TRUSSES, DESIGN CONFORMS WITH APPLICABLE PROVISIONS OF NDS (NATIONAL DESIGN SPEC. BY AIA/PA) AND TPI. ALPINE CONNECTOR PLATES ARE MADE OF 20/18/16GA (W/S/S) ASTM A653 GRADE 40/50 (W, K/H, S) GALV. STEEL. APPLY PLATES TO EACH FACE OF TRUSS AND, UNLESS OTHERWISE LOCATED ON THIS DESIGN, POSITION PER DRAWINGS 160A, 2. ANY INSPECTION OF PLATES FOLLOWED BY (1) SHALL BE PER ANNEX A3 OF TPI 2002 SEC.3. A SEAL ON THIS DRAWING INDICATES ACCEPTANCE OF PROFESSIONAL ENGINEERING RESPONSIBILITY SOLELY FOR THE TRUSS COMPONENT DESIGN SHOWN. THE SUITABILITY AND USE OF THIS COMPONENT FOR ANY BUILDING IS THE RESPONSIBILITY OF THE BUILDING DESIGNER PER ANSI/TPI 1 SEC. 2.



Alpine Engineered Products, Inc.
1950 Highway D
Haines City, FL 33844
State of FL # 567



TC LL	24.0 PSF	REF R487-- 25835
TC DL	16.0 PSF	DATE 07/19/06
BC DL	10.0 PSF	DRW HCUR487 06200004
BC LL	0.0 PSF	HC-ENG JB/AF
TOT.LD.	50.0 PSF	SEQN- 50464 REV
DUR.FAC.	1.25	
SPACING	24.0"	JRFF- 1S21487 201

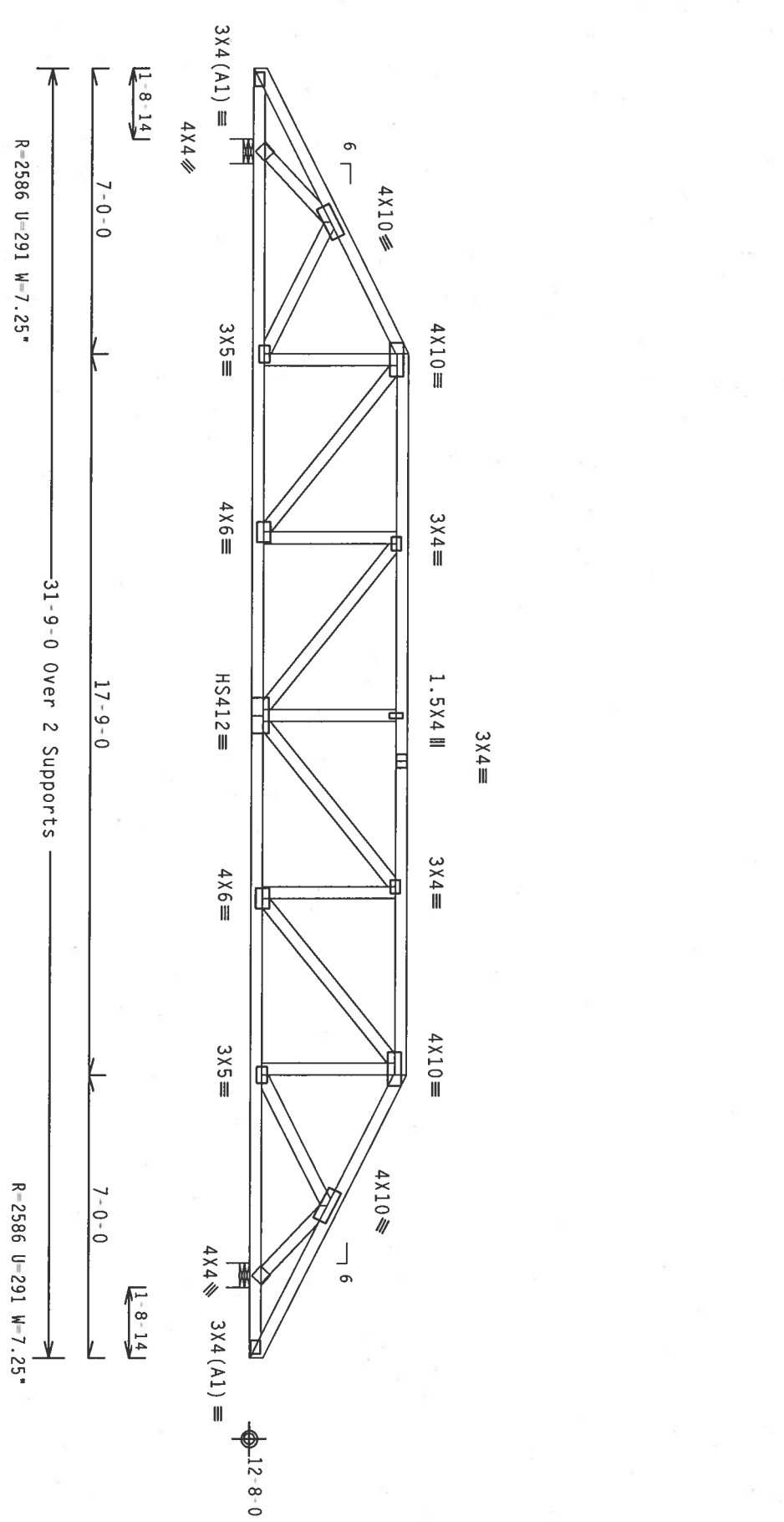
Top chord 2x4 SP #2 Dense
 Bot chord 2x4 SP #2 Dense
 Webs 2x4 SP #3

110 mph wind, 15.00 ft mean hgt, ASCE 7-02, CLOSED bldg, located anywhere in roof, CAT III OR IV, EXP B, wind TC DL=5.0 psf, wind BC DL=5.0 psf.

In lieu of structural panels or rigid ceiling use purlins to brace TC @ 24" OC, BC @ 24" OC.

#1 hip supports 7'-0" jacks w/2 panel TC and no end vert.

Deflection meets L/360 live and L/240 total load. Creep increase factor for dead load is 1.50.



PLT TYP. 20 Gauge HS, Wave

Design Cr1: TPI-2002(STD)/FBC

Scale = .25"/ft.

ALPINE

Alpine Engineered Products, Inc.
 1950 Marley Drive
 Gaines City, FL 33944
 Phone: 813-391-1111
 Fax: 813-391-1112
 Email: info@alpineeng.com

PROFESSIONAL ENGINEER

STATE OF FLORIDA

NO. 6012

DATE: 07/19/06

PROJECT: 1521487

SCALE: 1/4" = 1'-0"

ITEM	DESCRIPTION	QUANTITY	UNIT	PRICE	TOTAL
1	TC LL	24.0	PSF		
2	TC DL	16.0	PSF		
3	BC DL	10.0	PSF		
4	BC LL	0.0	PSF		
5	TOT. LD.	50.0	PSF		
6	DUR. FAC.	1.25			
7	SPACING	24.0"			

DRW HCUSR487 06200001

HC-ENG JB/AF

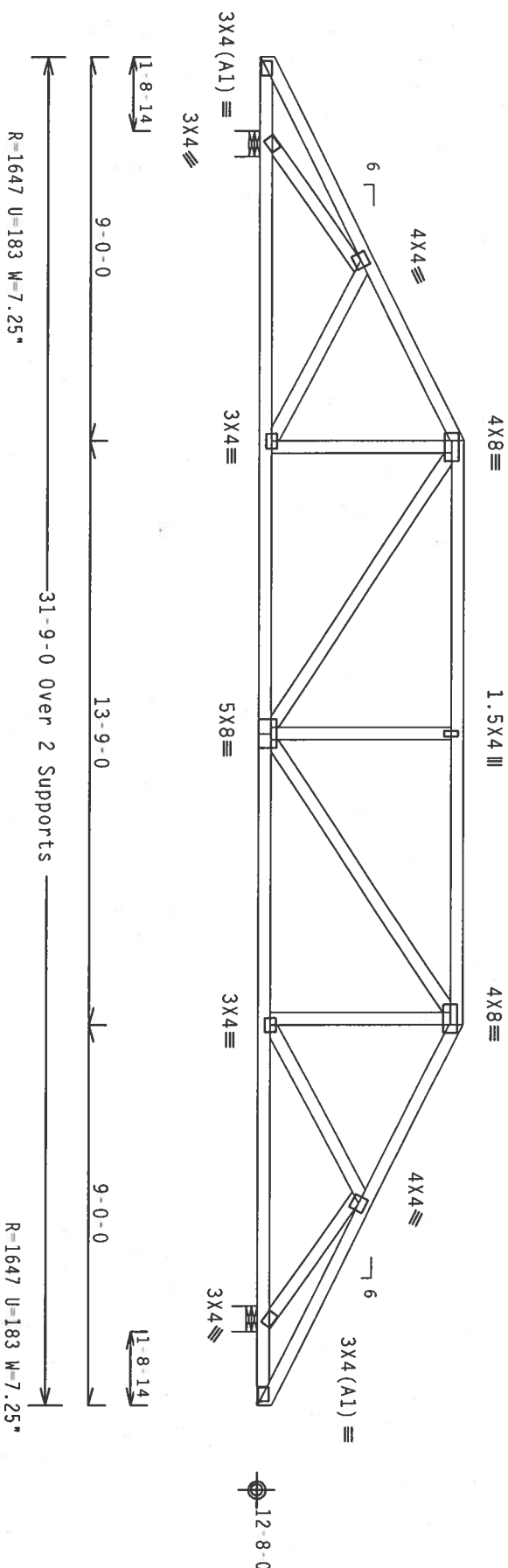
SEQN- 115879

JRFF- 1521487 201

Top chord 2x4 SP #2 Dense
Bot chord 2x4 SP #2 Dense
Webs 2x4 SP #3

In lieu of structural panels or rigid ceiling use purlins to
brace TC @ 24" OC, BC @ 24" OC.

110 mph wind, 15.26 ft mean hgt, ASCE 7-02, CLOSED bldg, not
located within 4.50 ft from roof edge, CAT III OR IV, Exp B, wind
TC DL=5.0 psf, wind BC DL=5.0 psf.
Deflection meets L/360 live and L/240 total load. Creep increase
factor for dead load is 1.50.



PLT TYP. Wave

Design Crit: TPI-2002(STD)/FBC
Cq/RT=1.00(1.25)/10(0)

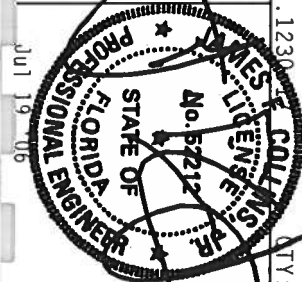
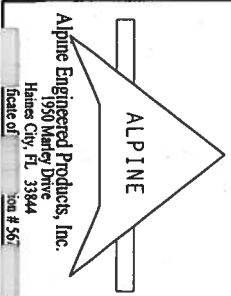
7.24.1230

TY:1 FL/-7/-/-/R/-

Scale = .25"/ft.

WARNING** TRUSSES REQUIRE EXTREME CARE IN FABRICATION, HANDLING, SHIPPING, INSTALLING AND BRACING. REFER TO BC&I 1-03 (BUILDING COMPONENT SAFETY INFORMATION), PUBLISHED BY TPI (TRUSS PLATE INSTITUTE), 563 MADISON, WISCONSIN 53719 FOR SAFETY PRACTICES. TRUSS CONNECTOR PLATES MUST BE USED AND PROPERLY LOCATED. TOP CHORD SHALL HAVE PROPERLY ATTACHED STRUCTURAL PANELS AND BOTTOM CHORD SHALL HAVE A PROPERLY ATTACHED RIGID CEILING.

IMPORTANT** FURNISH A COPY OF THIS DESIGN TO THE INSTALLATION CONTRACTOR. ALPINE ENGINEERED PRODUCTS, INC. SHALL NOT BE RESPONSIBLE FOR ANY DEVIATION FROM THIS DESIGN: OR FABRICATING, HANDLING, SHIPPING, INSTALLING & BRACING OF TRUSSES. DESIGN CONFORMS WITH APPLICABLE PROVISIONS OF NDS (NATIONAL DESIGN SPEC. BY AIA&P AND TPI). ALPINE PLATES TO EACH FACE OF TRUSS AND, UNLESS OTHERWISE LOCATED ON THIS DESIGN, POSITION PER DRAWINGS 160A-Z. ANY INSPECTION OF PLATES FOLLOWED BY (1) SHALL BE PER ANNEX A3 OF TPI-2002 SEC.3. A SEAL ON THIS DRAWING INDICATES ACCEPTANCE OF PROFESSIONAL ENGINEERING RESPONSIBILITY SOLELY FOR THE TRUSS COMPONENT DESIGN SHOWN. THE SUSTAINABILITY AND USE OF THIS COMPONENT FOR ANY BUILDING IS THE RESPONSIBILITY OF THE BUILDING DESIGNER PER ANSI/TPI 1 SEC. 2.



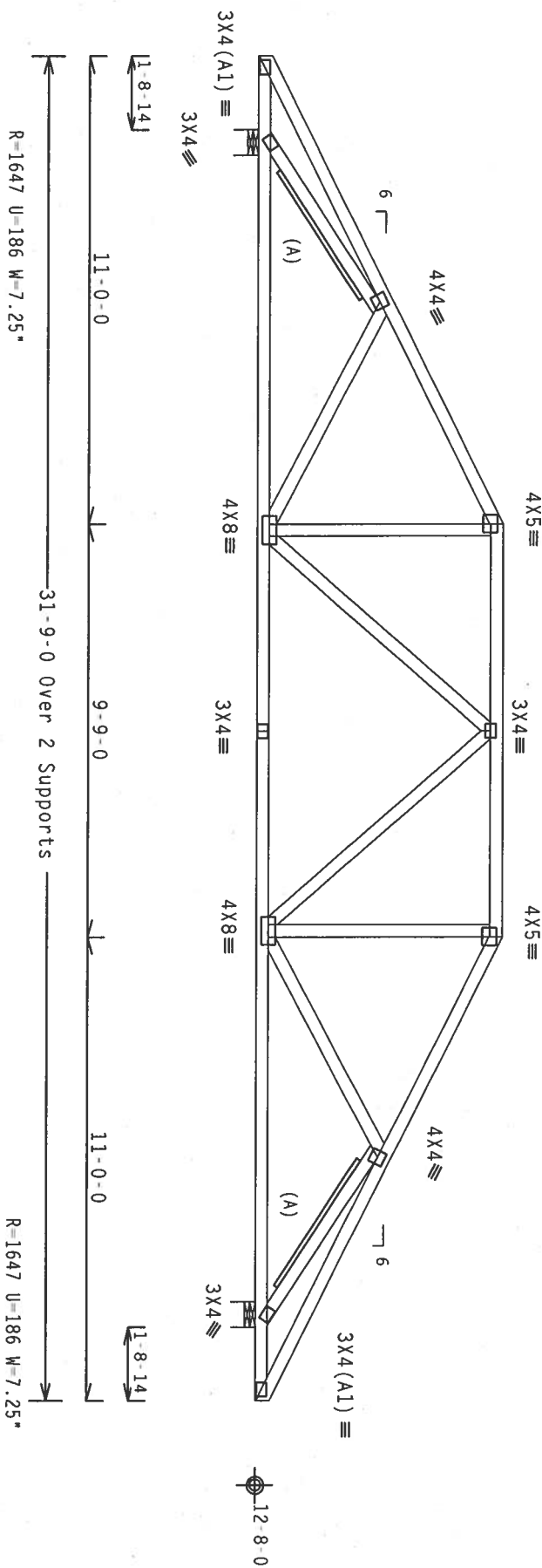
TC LL	24.0 PSF	REF R487 - 25837
TC DL	16.0 PSF	DATE 07/19/06
BC DL	10.0 PSF	DRW HCUSR487 06200011
BC LL	0.0 PSF	HC-ENG JB/AF
TOT.LD.	50.0 PSF	SEON- 115886
DUR.FAC.	1.25	
SPACING	24.0"	JREF - 1S21487, 201

Top chord 2x4 SP #2 Dense
Bot chord 2x4 SP #2 Dense
Webs 2x4 SP #3

(A) 1x4 SP #3 or better "T" brace. 80% length of web member.
Attach with 8d Box or Gun (0.113"x2.5", min.) nails @ 6" OC.

Deflection meets L/360 live and L/240 total load. Creep increase factor for dead load is 1.50.

110 mph wind, 15.76 ft mean hgt, ASCE 7-02, CLOSED bldg, not located within 4.50 ft from roof edge, CAT III OR IV, Exp B, wind TC DL=5.0 psf, wind BC DL=5.0 psf.
In lieu of structural panels or rigid ceiling use purlins to brace TC @ 24" OC, BC @ 24" OC.



PLT TYP. Wave

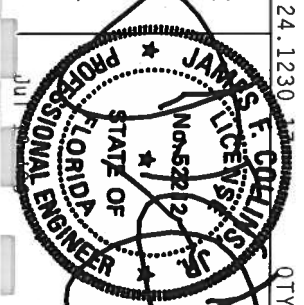
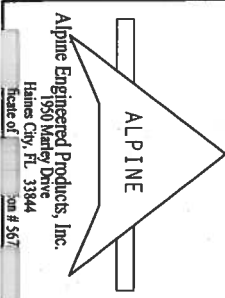
Design Crit: TPI-2002(STD)/FBC
Cq/RT=1.00(1.25)/10(0)

QTY: 1 FL/-/7/-/R/-

Scale = .25"/ft.

****WARNING**** TRUSSES REQUIRE EXTREME CARE IN FABRICATION, HANDLING, SHIPPING, INSTALLING AND BRACING. REMEMBER TO USE THE FOLLOWING COMPONENT SAFETY INFORMATION, PUBLISHED BY TPI (TRUSS PLATE INSTITUTE, 565 DUNBAR RD., SUITE 100, MADISON, WI 53719) FOR SAFETY PRACTICES PRIOR TO PERFORMING THESE FUNCTIONS. ALWAYS WEAR YOUR SAFETY BELT. TOP CHORD SHALL HAVE PROPERLY ATTACHED STRUCTURAL PANELS AND BOTTOM CHORD SHALL HAVE A PROPERLY ATTACHED RIGID CEILING.

****IMPORTANT**** FURNISH A COPY OF THIS DESIGN TO THE INSTALLATION CONTRACTOR. ALPINE ENGINEERED PRODUCTS, INC. SHALL NOT BE RESPONSIBLE FOR ANY DETAILING FROM THIS DESIGN. TRUSS IN CONFORMANCE WITH TPI: OR FABRICATING, HANDLING, SHIPPING, INSTALLING & BRACING OF TRUSSES. DESIGN CONFORMS WITH APPLICABLE PROVISIONS OF NDS (NATIONAL DESIGN SPEC. BY AREA) AND TPI. ALPINE CONNECTOR PLATES ARE MADE OF 20/18/16GA (W/H/S) ASTM A653 GRADE 40/60 (W. K/H/S) GALV. STEEL. APPLY PLATES TO EACH FACE OF TRUSS AND, UNLESS OTHERWISE LOCATED ON THIS DESIGN, POSITION PER DRAWINGS 160A-Z. ANY INSPECTION OF PLATES FOLLOWED BY (1) SHALL BE PER ANNEX A3 OF TPI-2002 SEC. 3. A SEAL ON THIS DRAWING INDICATES ACCEPTANCE OF PROFESSIONAL ENGINEERING RESPONSIBILITY SOLELY FOR THE TRUSS COMPONENT DESIGN SHOWN. THE SUITABILITY AND USE OF THIS COMPONENT FOR ANY BUILDING IS THE RESPONSIBILITY OF THE BUILDING DESIGNER PER ANSI/TPI 1 SEC. 2.



TC LL	24.0 PSF	REF R487--	25838
TC DL	16.0 PSF	DATE	07/19/06
BC DL	10.0 PSF	DRW HCUSR487	06200017
BC LL	0.0 PSF	HC-ENG JB/AF	
TOT.LD.	50.0 PSF	SEQN-	115892
DUR.FAC.	1.25		
SPACING	24.0"	JRFF-1S21487	201

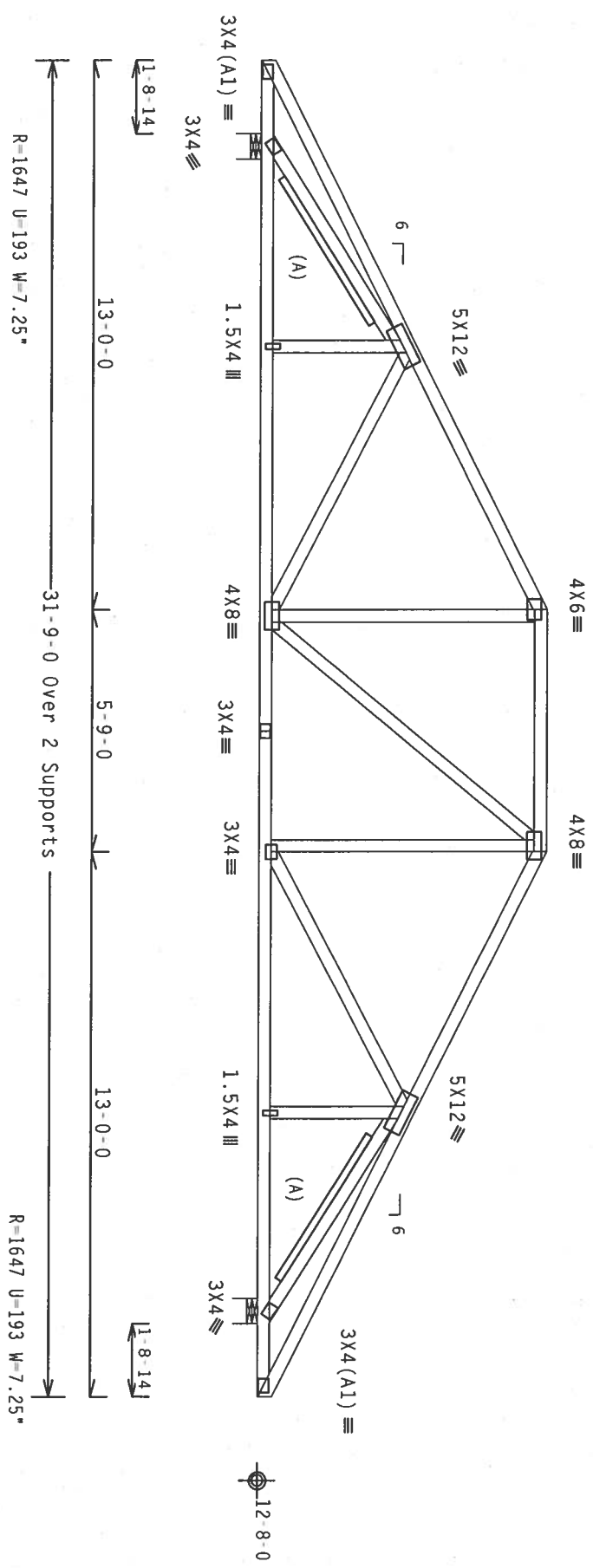
Top chord 2x4 SP #2 Dense
Bot chord 2x4 SP #2 Dense
Webs 2x4 SP #3

(A) 2x4 SP #3 or better "T" brace. 80% length of web member.
Attach with 16d Box or Gun (0.135"x3.5", min.) nails @ 6" OC.

Deflection meets L/360 live and L/240 total load. Creep increase factor for dead load is 1.50.

110 mph wind, 16.26 ft mean hgt, ASCE 7-02, CLOSED bldg, not located within 4.50 ft from roof edge, CAT III OR IV, Exp B, wind TC DL=5.0 psf, wind BC DL=5.0 psf.

In lieu of structural panels or rigid ceiling use purlins to brace TC @ 24" OC, BC @ 24" OC.



PLT TYP. Wave

Design Crit: TPI-2002(STD)/FBC
Cq/RT=1.00(1.25)/10(0)

QTY: 1 FL/-/7/-/R/-

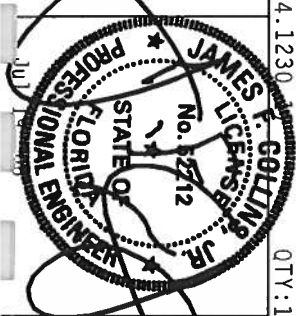
Scale = .25" / Ft.

****WARNING**** TRUSSES REQUIRE EXTREME CARE IN FABRICATION, HANDLING, SHIPPING, INSTALLING AND BRACING. REFER TO BEST PRACTICES (CIBUILDING COMPONENT SAFETY INFORMATION), PUBLISHED BY TPI (TRUSS PLATE INSTITUTE, 593 HARRISON BLVD, SUITE 200, HARRISON, NJ 07033) AND AISC (STEEL EDUCATION CENTER, 500 N. MORTIMER AVE., PITTSBURGH, PA 15222) FOR ADDITIONAL INFORMATION. TOP CHORD SHALL HAVE PROPERLY ATTACHED STRUCTURAL PANELS AND BOTTOM CHORD SHALL HAVE A PROPERLY ATTACHED RIGID CEILING.

****IMPORTANT**** FURNISH A COPY OF THIS DESIGN TO THE INSTALLATION CONTRACTOR. ALPINE ENGINEERED PRODUCTS, INC. SHALL NOT BE RESPONSIBLE FOR ANY DEVIATION FROM THIS DESIGN. ANY FAILURE TO BUILD THE TRUSS IN CONFORMANCE WITH TPI OR FABRICATING, HANDLING, SHIPPING, INSTALLING & BRACING OF TRUSSES, DESIGN CONFORMS WITH APPLICABLE PROVISIONS OF NDS (NATIONAL DESIGN SPEC. BY AIAA) AND TPI. APPLY CONNECTOR PLATES ARE MADE OF 2018/16GA (W/H/S/N) ASTM A653 GRADE 40/50 (W. K/H/S) GALV. STEEL. APPLY PLATES TO EACH FACE OF TRUSS AND, UNLESS OTHERWISE LOCATED ON THIS DESIGN, POSITION PER DRAWINGS 160A. ANY INSPECTION OF PLATES FOLLOWED BY (1) SHALL BE PER ANNEX A3 OF TPI-2002 SEC.3. A SEAL ON THIS DRAWING INDICATES ACCEPTANCE OF PROFESSIONAL ENGINEERING RESPONSIBILITY SOLELY FOR THE TRUSS COMPONENT DESIGN SHOWN. THE SUITABILITY AND USE OF THIS COMPONENT FOR ANY BUILDING IS THE RESPONSIBILITY OF THE BUILDING DESIGNER PER ANSI/TPI 1 SEC. 2.



Alpine Engineered Products, Inc.
1950 Marley Drive
Haines City, FL 33844
Tel: 888.251.2517
Fax: 888.251.2518
Web: www.alpine-engineered.com



TC LL	24.0 PSF	REF	R487 - 25839
TC DL	16.0 PSF	DATE	07/19/06
BC DL	10.0 PSF	DRW	HCUSR487 06200026
BC LL	0.0 PSF	HC-ENG	JB/AF
TOT.LD.	50.0 PSF	SEQN-	115898
DUR.FAC.	1.25		
SPACING	24.0"	JRFF-	1521487 201

110 mph wind, 16.76 ft mean hgt, ASCE 7-02, CLOSED bldg, not located within 4.50 ft from roof edge, CAT III OR IV, EXP B, wind TC DL=5.0 psf, wind BC DL=5.0 psf.

(A) 2x6 SP #3 or better "T" brace. 80% length of web member. Attach with 16d Box or Gun (0.135"x3.5", min.) nails @ 6" OC.

Deflection meets $L/360$ live and $L/240$ total load. Creep increase factor for dead load is 1.50.

Design Crit: $TPI-2002(STD)/FBC$ $Cq/RT=1.00(1.25)/10(0)$

QTY:1 FL/-/7/-/-/R/-

Scale = .25"/Ft.



****IMPORTANT** FURNISH A COPY OF THIS DESIGN TO THE INSTALLATION CONTRACTOR**

ALPINE

Alpine Engineered Products, Inc.

Case of A on # 567

FL/-/7/-/-/R/-		Scale = .25"/ft.	
IC LL	24.0 PSF	REF	R487 -- 25840
TC DL	16.0 PSF	DATE	07/19/06
BC DL	10.0 PSF	DRW	HCUSR487 06200030
BC LL	0.0 PSF	HC-ENG	JB/AF
TOT.LD.	50.0 PSF	SEON-	115902
DUR.FAC.	1.25		
SPACING	24.0"	JRFT	1S21407 201

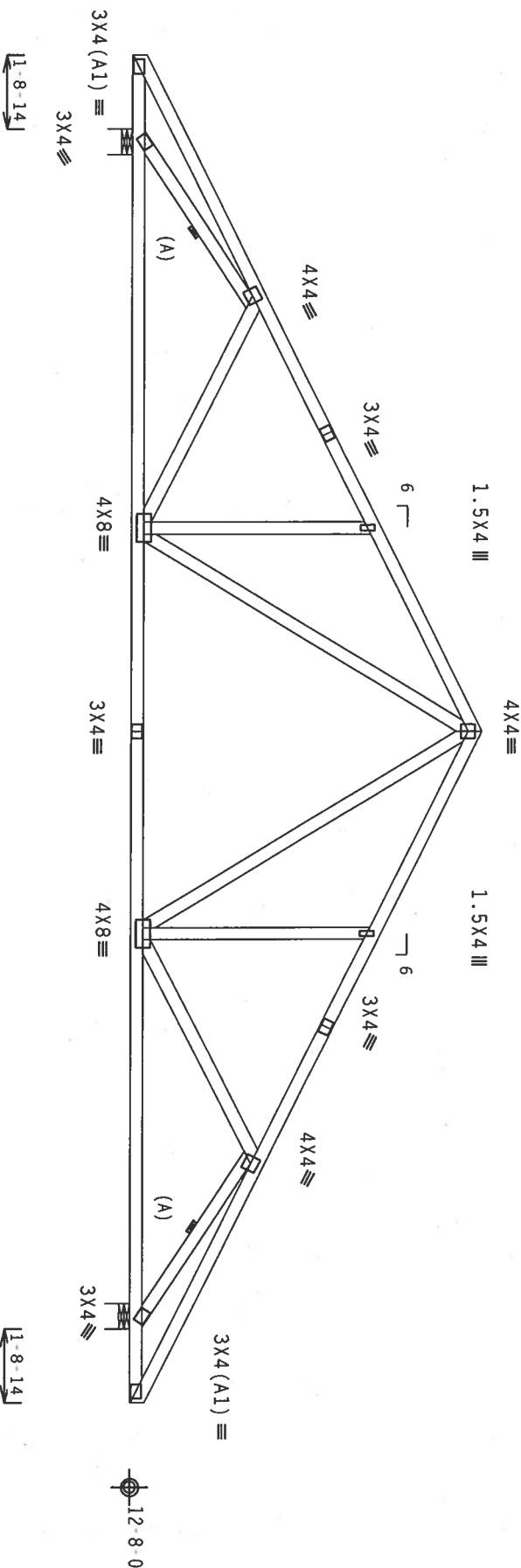
JRFE 15Z1407 201

Top chord 2x4 SP #2 Dense
Bot chord 2x4 SP #2 Dense
Webs 2x4 SP #3

(A) Continuous lateral bracing equally spaced on member.

Deflection meets L/360 live and L/240 total load. Creep increase factor for dead load is 1.50.

110 mph wind, 16.98 ft mean hgt, ASCE 7-02, CLOSED bldg, not located within 4.50 ft from roof edge, CAT III OR IV, Exp B, wind TC DL=5.0 psf, wind BC DL=5.0 psf.
In lieu of structural panels or rigid ceiling use purlins to brace TC @ 24" OC, BC @ 24" OC.



R-1647 U-204 W-7.25"

R-1647 U-204 W-7.25"

PLT TYP. Wave

Design Crit: TPI-2002(STD)/FBC
Cq/RT=1.00(1.25)/10(0)

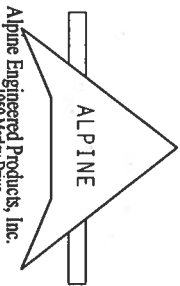
DATE: 18 JUL 2002

Scale = .25"/ft.

****WARNING**** TRUSSES REQUIRE EXTREME CARE IN FABRICATION, HANDLING, SHIPPING, INSTALLING AND BRACING. RIGID TO DECK. TOP BUILDING COMPONENTS MUST BE PROTECTED FROM DAMAGE. BOTTOM CHORDS MUST BE PROTECTED FROM DAMAGE. TOP CHORDS MUST HAVE PROPERLY ATTACHED STRUCTURAL PANELS AND BOTTOM CHORDS MUST HAVE A PROPERLY ATTACHED RIGID CEILING.

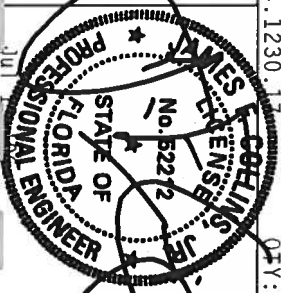
****IMPORTANT**** FURNISH A COPY OF THIS DESIGN TO THE INSTALLATION CONTRACTOR.

PRODUCTS, INC. SHALL NOT BE RESPONSIBLE FOR ANY DEVIATION FROM THIS DESIGN. ANY FAILURE TO BUILD THE TRUSS IN CONFORMANCE WITH TPI-2002 (STD) OR FABRICATING, HANDLING, SHIPPING, INSTALLING & BRACING OF TRUSSES DESIGN CONFORMS WITH APPLICABLE PROVISIONS OF NDS (NATIONAL DESIGN SPEC. BY AF&PA) AND TPI-2002 (STD). CONNECTOR PLATES ARE MADE OF 20/18/16GA (W, W/S/X) ASTM A653 GRADE 40/60 (W, W/S/X) GALV. STEEL. APPLY PLATES TO EACH FACE OF TRUSS AND, UNLESS OTHERWISE LOCATED ON THIS DESIGN, POSITION PER DRAWINGS 160A-Z. ANY INSPECTION OF PLATES FOLLOWED BY (1) SHALL BE PER ANNEX A3 OF TPI-2002 SEC.3. A SEAL ON THIS DRAWING INDICATES ACCEPTANCE OF PROFESSIONAL ENGINEERING RESPONSIBILITY SOLELY FOR THE TRUSS COMPONENT DESIGN SHOWN. THE SUITABILITY AND USE OF THIS COMPONENT FOR ANY BUILDING IS THE RESPONSIBILITY OF THE BUILDING DESIGNER PER ANSI/TPI 1 SEC. 2.



Alpine Engineered Products, Inc.
1990 Marley Drive
Haines City, FL 33844

Date of: 07/19/06



TC LL	24.0 PSF	REF	R487-- 25841
TC DL	16.0 PSF	DATE	07/19/06
BC DL	10.0 PSF	DRW	HCUSR487 06200034
BC LL	0.0 PSF	HC-ENG	JB/AF
TOT. LD.	50.0 PSF	SEQN-	115916
DUR. FAC.	1.25		
SPACING	24.0"		

JREF-1S21A87 201

Top chord 2x6 SP #1 Dense
Bot chord 2x8 SP SS
Webs 2x4 SP #3 : W5 2x4 SP #2 Dense:
Lt Slider 2x6 SP #2: BLOCK LENGTH = 1.755'
:Rt Slider 2x6 SP #2: BLOCK LENGTH = 1.754'

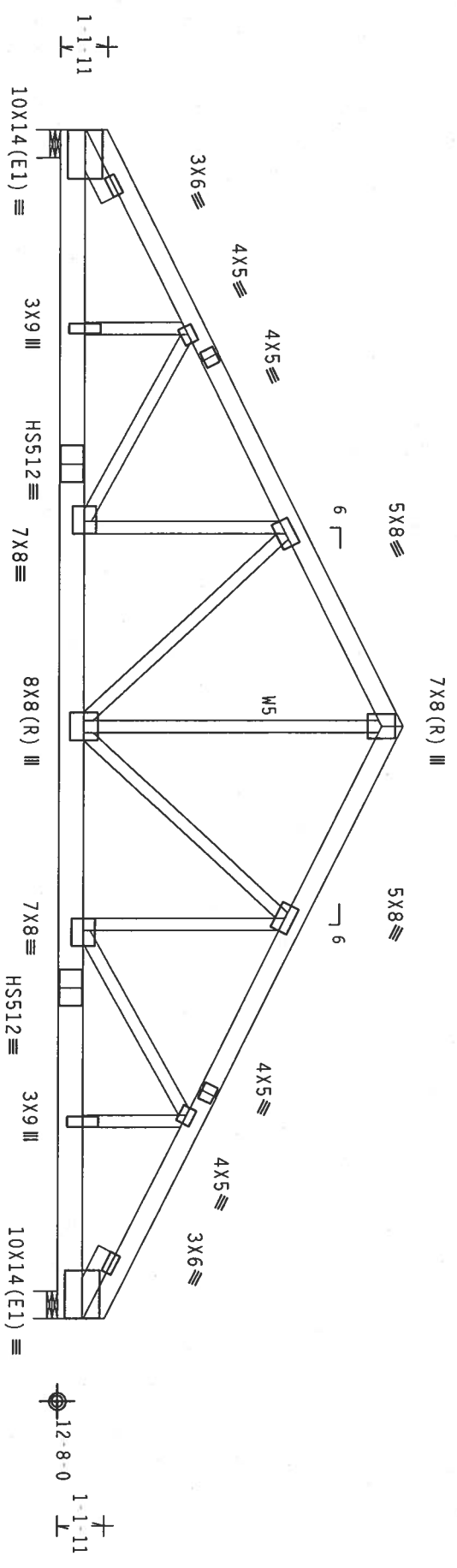
SPECIAL LOADS

----- (LUMBER DUR.FAC. = 1.25 / PLATE DUR.FAC. = 1.25)
TC - From 84 PLF at 0.00 to 84 PLF at 28.58
BC - From 20 PLF at 0.00 to 20 PLF at 28.58
BC - 2210 LB Conc. Load at 2.15', 4.15', 6.15', 8.15', 10.15'
12.15', 12.44', 14.44', 16.44', 18.44', 20.44', 22.44', 24.44', 26.44'

In lieu of structural panels or rigid ceiling use purlins to
brace TC @ 24" OC, BC @ 24" OC.

3 COMPLETE TRUSSES REQUIRED

Nailing Schedule: (12d Common (0.148"x3.25", min.) nails)
Top Chord: 1 Row @ 12.00" o.c.
Bot Chord: 2 Rows @ 3.50" o.c. (Each Row)
Webs : 1 Row @ 4" o.c.
Repeat nailing as each layer is applied. Use equal spacing
between rows and stagger nails in each row to avoid splitting.
110 mph wind, 17.38 ft mean hgt, ASCE 7-02, CLOSED bldg, not
located within 4.50 ft from roof edge, CAT III OR IV, Exp B, wind
TC DL=5.0 psf, wind BC DL=5.0 psf.
Deflection meets L/360 live and L/240 total load. Creep increase
factor for dead load is 1.50.



PLT TYP. 20 Gauge HS, Wave

Design Crit: TPI-2002(STD)/FBC
Cq/RT=1.00(1.25)/10(0)

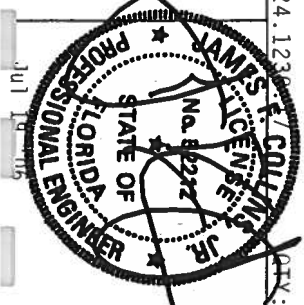
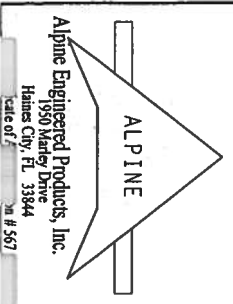
FL/-7/-/-/R/-

Scale = .25" / ft.

WARNING TRUSSES REQUIRE EXTREME CARE IN FABRICATION, HANDLING, SHIPPING, INSTALLING AND BRACING.
REFER TO BCSP 1-03 (BUILDING COMPONENT SAFETY INFORMATION), PUBLISHED BY TPI (TRUSS PLATE INSTITUTE, 583
D'AMORE DR., SUITE 200, MADISON, WI 53719) AND WCA (WOOD TRUSS COUNCIL OF AMERICA, 6300 ENTERPRISE LN,
MADISON, WI 53719) FOR SAFETY PRACTICES PRIOR TO PERFORMING THESE FUNCTIONS. UNLESS OTHERWISE INDICATED,
THESE TRUSSES SHALL HAVE PROPERLY ATTACHED STRUCTURAL PANELS AND BOTTOM CHORD SHALL HAVE A PROPERLY ATTACHED
RIGID CEILING.

IMPORTANT FURNISH A COPY OF THIS DESIGN TO THE INSTALLATION CONTRACTOR.

ALPINE ENGINEERED PRODUCTS, INC. SHALL NOT BE RESPONSIBLE FOR ANY DEVIATION FROM THIS DESIGN. ANY FAILURE OF THE TRUSSES
OR FABRICATING, HANDLING, SHIPPING, INSTALLING AND BRACING OF TRUSSES.
DESIGN CONFORMS WITH APPLICABLE PROVISIONS OF NDS (NATIONAL DESIGN SPEC. BY APA) AND TPI. ALPINE
CONNECTOR PLATES ARE MADE OF 20/18/16GA (W/H/S) ASTM A653 GRADE 40/60 (W, K/H, S) GALV. STEEL. APPLY
PLATES TO EACH FACE OF TRUSS AND, UNLESS OTHERWISE LOCATED ON THIS DESIGN, POSITION PER DRAWINGS 160A, Z.
ANY INSPECTION OF PLATES FOLLOWED BY (I) SHALL BE PER ANNEX A3 OF TPI-2002 SEC.3. A SEAL ON THIS
DRAWING INDICATES ACCEPTANCE OF PROFESSIONAL ENGINEERING RESPONSIBILITY SOLELY FOR THE TRUSS COMPONENT
DESIGN SHOWN. THE SUITABILITY AND USE OF THIS COMPONENT FOR ANY BUILDING IS THE RESPONSIBILITY OF THE
BUILDING DESIGNER PER ANSI/TPI 1 SEC. 2.



TC LL	24.0 PSF	REF R487 - 25842
TC DL	16.0 PSF	DATE 07/19/06
BC DL	10.0 PSF	DRW HCUSR487 06200007
BC LL	0.0 PSF	HC-ENG JB/AF
TOT.LD.	50.0 PSF	SEQN- 116093
DUR.FAC.	1.25	
SPACING	24.0"	JRFF- 1S21A87 201

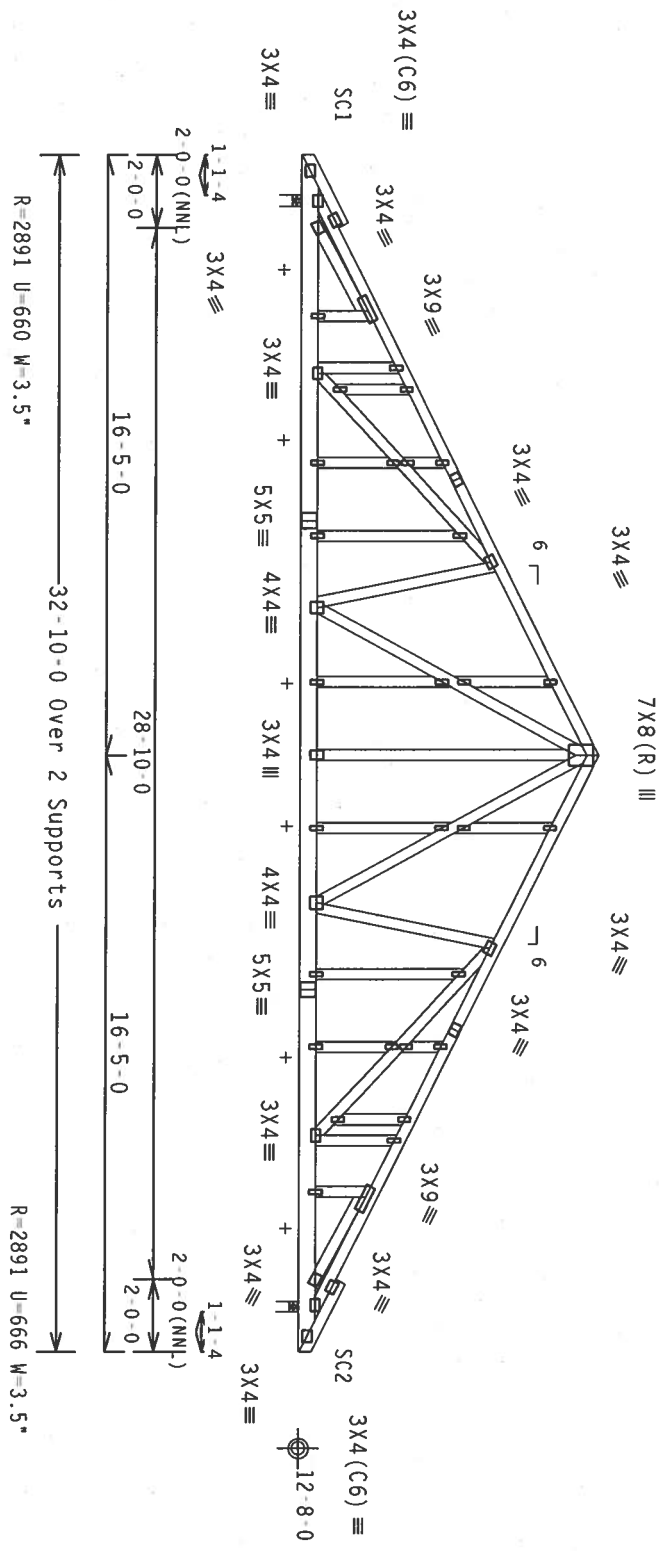
Top chord 2x4 SP #2 Dense
Bot chord 2x6 SP #1 Dense
Webs 2x4 SP #3
Stack Chord SC1 2x4 SP #2 Dense:
Stack Chord SC2 2x4 SP #2 Dense:

Gable end supports 8" max rake overhang.

Stacked top chord must NOT be notched or cut in area (NML).
Dropped top chord braced at 24" o.c. intervals. Attach stacked top chord (SC) to dropped top chord in notchable area using 3x4 tie plates 24" o.c. Center plate on stacked/dropped chord interface, plate length perpendicular to chord length. Splice top chord in notchable area using 3x6.

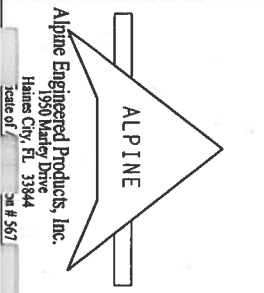
See DWGS A11030E0405 & GBLLETT10405 for more requirements.

110 mph wind, 17.01 ft mean hgt, ASCE 7-02, CLOSED bldg, Located anywhere in roof, Cat III or IV, EXP B, wind TC DL=5.0 psf, wind BC DL=5.0 psf.
In lieu of structural panels or rigid ceiling use purlins to brace TC @ 24" OC, BC @ 24" OC.
Deflection meets L/360 live and L/240 total load. Creep increase factor for dead load is 1.50.
+ MEMBER TO BE Laterally Braced for Wind Loads Perpendicular to Truss. Bracing system to be designed and furnished by others.
THE BUILDING DESIGNER IS RESPONSIBLE FOR THE DESIGN OF THE ROOF AND CEILING DIAPHRAGMS, GABLE END SHEAR WALLS, AND SUPPORTING SHEAR WALLS. SHEAR WALLS MUST PROVIDE CONTINUOUS LATERAL RESTRAINT TO THE GABLE END. ALL CONNECTIONS TO BE DESIGNED BY THE BUILDING DESIGNER.



Note: All Plates Are 1.5X4 Except As Shown.
Design Crit: TPI-2002(STD)/FBC
Cq/RT=1.00(1.25/10.0) 7.24.1230.17

Scale = .1875"/ft.



ALPINE
Engineered Products, Inc.
1950 Marley Drive
Haines City, FL 33844
Scale 0.1" = 1'-0"

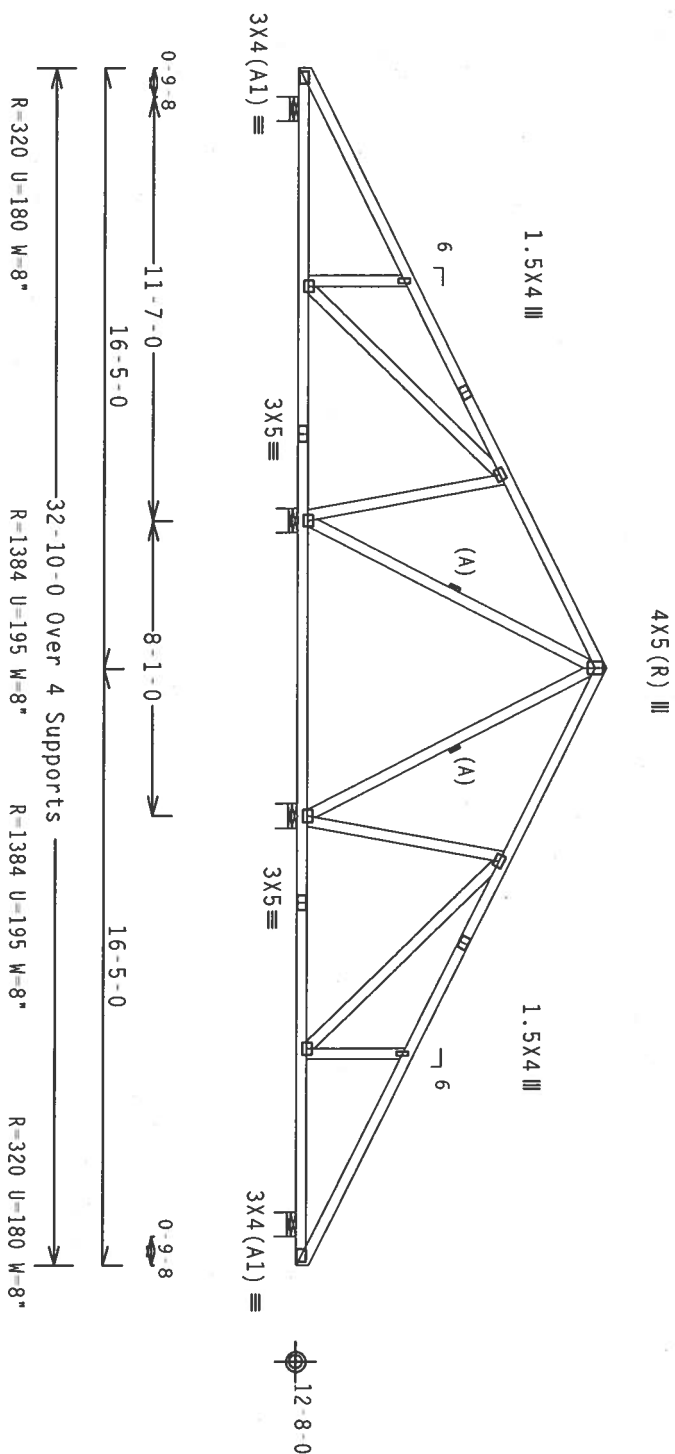


QTY: 1	FL-77-1-R/-	Scale = .1875"/ft.
TC LL	24.0 PSF	REF R487-- 25843
TC DL	16.0 PSF	DATE 07/19/06
BC DL	10.0 PSF	DRW HCUSR487 06200015
BC LL	0.0 PSF	HC-ENG JB/AF
TOT. LD.	50.0 PSF	SEON- 115951 REV
DUR. FAC.	1.25	
SPACING	24.0"	JREF- 1S21A87 201

110 mph wind, 17.12 ft mean hgt, ASCE 7-02, CLOSED bldg, not located within 4.50 ft from roof edge, CAT III OR IV, EXP B, wind TC DL=5.0 psf, wind BC DL=5.0 psf.

In lieu of structural panels or rigid ceiling use purlins to brace TC @ 24" OC, BC @ 24" OC.

Deflection meets $L/360$ live and $L/240$ total load. Creep increase factor for dead load is 1.50.

Design Crit: $TPI - 2002(STD) / FBC$
$$Cq/RT=1.00(1.25)/10(0)$$

QT:2 FL-/-/-/-R/-

Scale = .1875"/Ft.

WARNING TRUSSES REQUIRE EXTENSIVE CARE IN FABRICATION, HANDLING, SHIPPING, INSTALLING AND BRACING. REFER TO EC3-1 (3) (BUILDING COMPONENT SAFETY INFORMATION), PUBLISHED BY TPI (TRUSS PLATE INSTITUTE), 583 D'ONOFIO DR., SUITE 200, MADISON, MI 48131, AND AISC (AMERICAN INSTITUTE OF STEEL CONSTRUCTION, INC.), 6500 ENTERPRISE BLVD., MADISON, MI 48179, FOR SAFETY PRACTICES PRIOR TO PERFORMING THESE FUNCTIONS. UNLESS OTHERWISE INDICATED, TOP CHORD SHALL HAVE PROPERLY ATTACHED STRUCTURAL PANELS AND BOTTOM CHORD SHALL HAVE A PROPERLY ATTACHED TIGHT CEILING.

****IMPORTANT** FURNISH A COPY OF THIS DESIGN TO THE INSTALLATION CONTRACTOR.**

PRODUCTS, INC. SHALL NOT BE RESPONSIBLE FOR ANY DEVIATION FROM THIS DESIGN: ANY FAILURE TO BUILD THE TRUSS IN CONFORMANCE WITH TPI: OR FABRICATING, HANDLING, SHIPPING, INSTALLING & BRACING OF TRUSSES.

DESIGN CONFORMS WITH APPLICABLE PROVISIONS OF NDS (NATIONAL DESIGN SPEC., BY AIA/P) AND IPI. ALPINE
CONNECTOR PLATES ARE MADE OF 20/18/16GA (M/M/S/K) ASTM A653 GRADE 40/60 (M. K/H/S) GALV. STEEL. APPLY
BLASTED TO EACH FACE OF MEMBER AND SURFACE OILPROOFED ON THIS SIDE. SEE DETAILING FOR 100%
BLASTED TO EACH FACE OF MEMBER AND SURFACE OILPROOFED ON THIS SIDE. SEE DETAILING FOR 100%
BLASTED TO EACH FACE OF MEMBER AND SURFACE OILPROOFED ON THIS SIDE. SEE DETAILING FOR 100%

ANY INSPECTION OF PLATES FOLLOWED BY (1) SHALL BE PER ANNEX A3 OF TP11-2002 SEC.3.
DRAWING INDICATES ACCORDING TO PROFESSIONAL ENGINEERING RESPONSIBILITY ACT FOR THE THREE COMPONENT
PLATES TO EACH TYPE OF TROSS AND, UNLESS OTHERWISE LOCATED ON THIS DESIGN, POSITION PER DRAWINGS 1604-2,
A SEAL ON THIS

DESIGN SHOWN. THE SUITABILITY AND USE OF THIS COMPONENT FOR ANY BUILDING IS THE RESPONSIBILITY OF THE BUILDING DESIGNER PER ANSI/TP1.1 SEC. 2.



Alpine Engineered Products, Inc.
1950 Marley Drive
Haines City, FL 33844

Scale of 1" = 1'-0"
on # 567

100

1

100

SPALING 24.0

JKF-T-15214X/201

Top chord 2x8 SP SS
 Bot chord 2x8 SP SS
 Webs 2x4 SP #3 :W5 2x6 SP #2:
 :Lt Wedge 2x4 SP #3:Rt Wedge 2x4 SP #3:

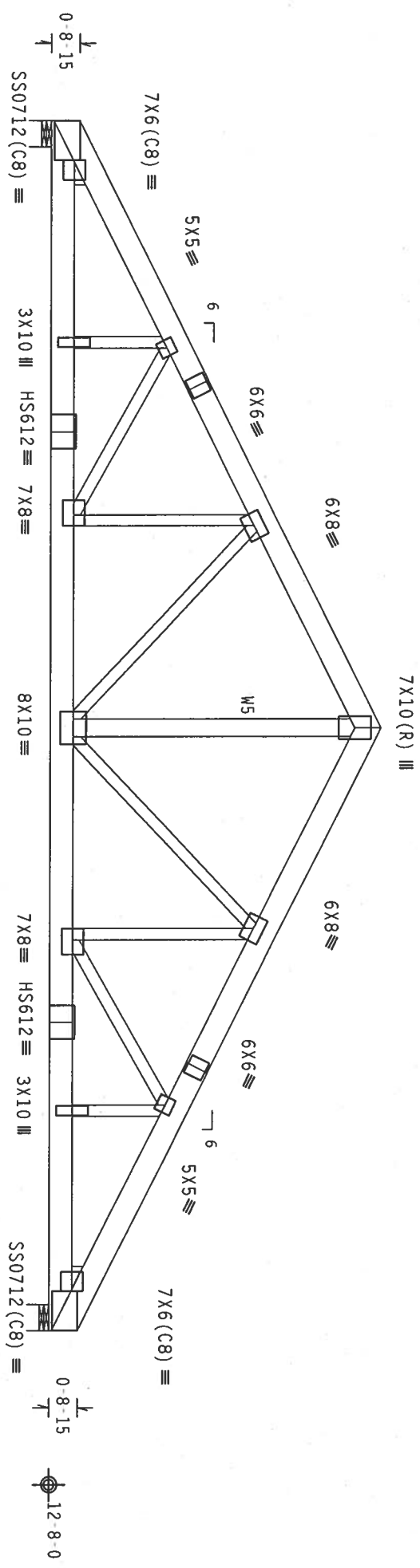
SPECIAL LOADS
 LUMBER DUR.FAC.=1.25 / PLATE DUR.FAC.=1.25
 TC - From 84 PLF at 0.00 to 84 PLF at 31.25
 BC - From 20 PLF at 0.00 to 20 PLF at 31.25
 BC - 2210 LB Conc. Load at 1.48, 3.48, 5.48, 7.48, 9.48
 11.48, 13.48, 13.77, 15.77, 17.77, 19.77, 21.77, 23.77, 25.77
 27.77, 29.77

In lieu of structural panels or rigid ceiling use purlins to brace TC @ 24" OC, BC @ 24" OC.

3 COMPLETE TRUSSES REQUIRED

Nailing Schedule: (12d Common (0.148"x3.25", min.) nails)
 Top Chord: 1 Row @12.00" o.c.
 Bot Chord: 2 Rows @3.50" o.c. (Each Row)
 Webs : 1 Row @ 4" o.c.
 Repeat nailing as each layer is applied. Use equal spacing between rows and stagger nails in each row to avoid splitting.
 110 mph wind, 17.32 ft mean hgt, ASCE 7-02, CLOSED bldg, not located within 4.50 ft from roof edge, CAT III OR IV, Exp B, wind TC DL=5.0 psf, wind BC DL=5.0 psf.

Deflection meets L/360 live and L/240 total load. Creep increase factor for dead load is 1.50.



PLT TYP. 20 Gauge HS, 18 Gauge HS, Design Crit: TPI-2002(STD)/FBC
 Wave Cq/RT=1.00(1.25)/10(0) 7.24.1230

****WARNING**** TRUSSES REQUIRE EXTREME CARE IN FABRICATION, HANDLING, SHIPPING, INSTALLING AND BRACING. BECAUSE OF THE LIGHT WEIGHT AND RIGIDITY OF THE TRUSSES, THEY ARE SUSCEPTIBLE TO BUCKLING AND COLLAPSE. THE TRUSSES MUST BE PROPERLY BRACED AND SUPPORTED. THE TRUSSES MUST BE PROPERLY HANDLED AND SHIPPED. THE TRUSSES MUST BE PROPERLY INSTALLED. THE TRUSSES MUST BE PROPERLY MAINTAINED. THE TRUSSES MUST BE PROPERLY REPAIRED. THE TRUSSES MUST BE PROPERLY REPLACED. THE TRUSSES MUST BE PROPERLY REMOVED. THE TRUSSES MUST BE PROPERLY DISPOSED. THE TRUSSES MUST BE PROPERLY RECYCLED. THE TRUSSES MUST BE PROPERLY REUSED. THE TRUSSES MUST BE PROPERLY REPAIRED. THE TRUSSES MUST BE PROPERLY REPLACED. THE TRUSSES MUST BE PROPERLY REMOVED. THE TRUSSES MUST BE PROPERLY DISPOSED. THE TRUSSES MUST BE PROPERLY RECYCLED. THE TRUSSES MUST BE PROPERLY REUSED.

****IMPORTANT**** FURNISH A COPY OF THIS DESIGN TO THE INSTALLATION CONTRACTOR. ALPINE ENGINEERED PRODUCTS, INC. SHALL NOT BE RESPONSIBLE FOR ANY DEVIATION FROM THIS DESIGN. THE DESIGN CONFORMS WITH APPLICABLE PROVISIONS OF NDS (NATIONAL DESIGN SPEC. BY APA) AND TPI. ALPINE PLATES TO EACH FACE OF TRUSS AND, UNLESS OTHERWISE LOCATED ON THIS DESIGN, POSITION PER DRAWINGS 160A-Z. ANY INSPECTION OF PLATES FOLLOWED BY (1) SHALL BE PER ANNEX A3 OF TPI-2002 SEC.3. A SEAL ON THIS DRAWING INDICATES ACCEPTANCE OF PROFESSIONAL ENGINEERING RESPONSIBILITY. SOCIETY FOR THE TRUSS COMPONENT BUILDING DESIGNER PER ANSI/TPI 1 SEC. 2.



Alpine Engineered Products, Inc.
 1950 Metro Drive
 Gainesville, FL 32606
 Phone: 352-339-4444
 Fax: 352-339-4445
 Email: info@alpine-engineered.com
 Website: www.alpine-engineered.com

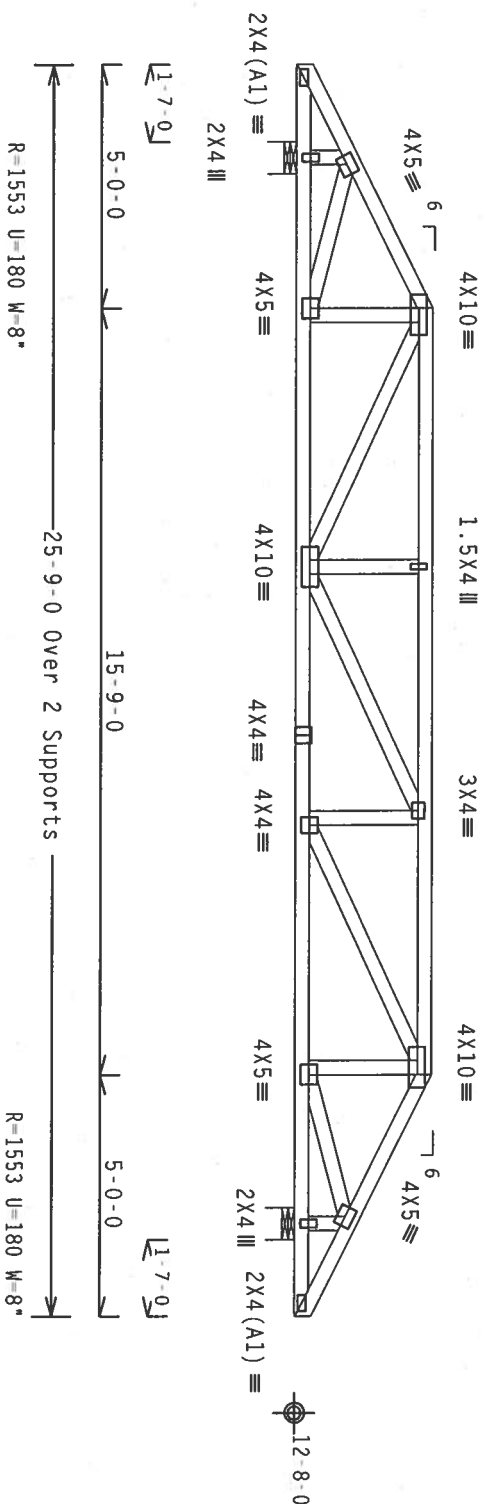


SPACING	DUR.FAC.	TOT.LD.	BC LL	BC DL	TC DL	TC LL
24.0"	1.25	50.0 PSF	0.0 PSF	10.0 PSF	16.0 PSF	24.0 PSF
JREF-15Z1487 201		SEQN-116114	HC-ENG JB/AF	DRW HCUSR487 06200037	DATE 07/19/06	REF R487--25846

In lieu of structural panels or rigid ceiling use purlins to brace TC @ 24" OC, BC @ 24" OC.

110 mph wind, 15.00 ft mean hgt, ASCE 7-02, CLOSED bldg, located anywhere in roof, CAT III OR IV, EXP B, wind TC DL-5.0 psf, wind BC DL=5.0 psf.

#1 hip supports 5-0-0 jacks W/2 panel TC and no end vert.
Deflection meets L/350 live and L/240 total load. Creep increase factor for dead load is 1.50.



Design Crit: TPI-2002(STD)/FBC
Cq/RT=1.00(1.25)/10(0)

QTY: 2 FL/-/7/-/-/R/-

Scale = .25"/Ft.

* * *WARNING** FRASSES REQUIRE EXISTENT CARE IN FABRICATION. HANDING BY SHIPPING, INSTALLING AND BRACING REFER TO GC-1.0 (BUILDING COMPONENT SAFETY INFORMATION), PUBLISHED BY THE STEEL PLATE INSTITUTE, 963 O'CONNOR DR., SUITE 200, MADISON, WI 53718, AND AISC (AMERICAN INSTITUTE OF STRUCTURAL ENGINEERS) 110 N. MADISON, MI 53719 FOR SAFETY PRACTICES PRIOR TO REPAIRING THESE FUNCTIONS. UNLESS OTHERWISE INDICATED, TOP CHORD SHALL HAVE PROPERLY ATTACHED STRUCTURAL PANELS AND BOTTOM CHORD SHALL HAVE A PROPERLY ATTACHED RIGID CEILING.

****IMPORTANT** FURNISH A COPY OF THIS DESIGN TO THE INSTALLATION CONTRACTOR.**

PRODUCTS, INC. SHALL NOT BE RESPONSIBLE FOR ANY DEVIATION FROM THIS DESIGN; ANY FAILURE OF THE TRUSS IN CONFORMANCE WITH TPI; OR FABRICATING, HANDLING, SHIPPING, INSTALLING & BRACING.

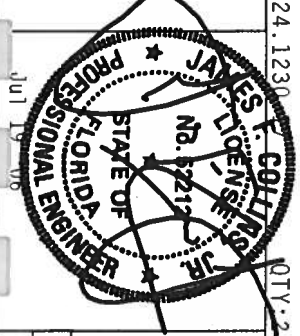
DESIGN CONFORMS WITH APPLICABLE PROVISIONS OF NDS (NATIONAL DESIGN SPEC. BY AIAA) AND TPI. ALPINE
CONNECTOR PLATES ARE MADE OF 20/18/16GA (M./H./S./K) ASTM A653 GRADE 40/60 (M./K./H./S) GALV. STEEL. APPLY

PLATES TO EACH FACE OF TRUSS AND, UNLESS OTHERWISE LOCATED ON THIS DESIGN, POSITION PER DRAWINGS 160A-Z. ANY INSPECTION OF PLATES FOLLOWED BY (1) SHALL BE REFERENCED AS OF TRUSS 160A-Z. A SEAL ON THIS

DRAWING INDICATES ACCEPTANCE OF PROFESSIONAL ENGINEERING RESPONSIBILITY SOLELY FOR THE TRUSS COMPONENT

DESIGN SHOWN. THE SUITABILITY AND USE OF THIS COMPONENT FOR ANY BUILDING IS THE RESPONSIBILITY OF THE BUILDING DESIGNER PER ANSI/TPI 1 SEC. 2.

BUILDING DESIGNER PER ANSI/HP 1 SEC. 2.



TC LL	24.0 PSF	REF	R487 - 25847
TC DL	16.0 PSF	DATE	07/19/06
BC DL	10.0 PSF	DRW	HCUSR487 06200008
BC LL	0.0 PSF	HC-ENG	JB/AF
TOT. LD.	50.0 PSF	SEQN-	115811
DUR. FAC.	1.25		
SPACING	24.0"	JRFF-	1SZ1487 201

Top chord 2x6 SP #1 Dense : T2 2x4 SP #2 Dense :
Bot chord 2x6 SP #1 Dense

Webs 2x4 SP #3
:Lt Slider 2x4 SP #3: BLOCK LENGTH = 1.531'
:Rt Slider 2x4 SP #3: BLOCK LENGTH = 1.531'

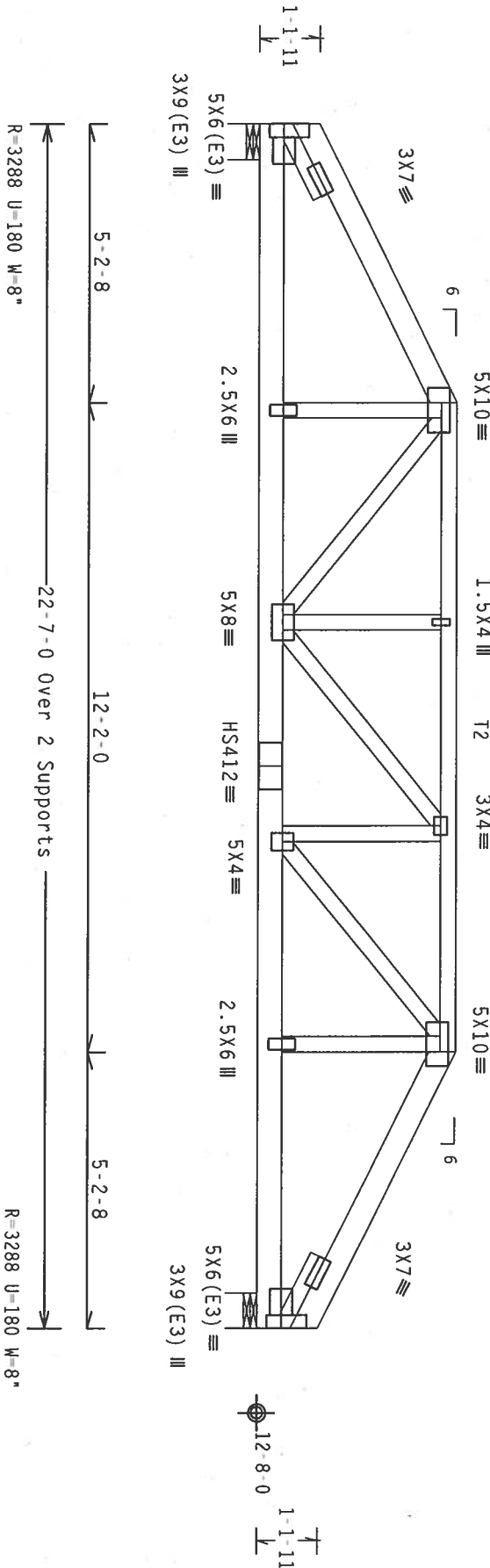
110 mph wind, 15.11 ft mean hgt, ASCE 7-02, CLOSED bldg, not located within 4.50 ft from roof edge, CAT III OR IV, Exp B, wind TC DL=5.0 psf, wind BC DL=5.0 psf.

Deflection meets L/360 live and L/240 total load. Creep increase factor for dead load is 1.50.

SPECIAL LOADS

----- (LUMBER DUR.FAC. = 1.25 / PLATE DUR.FAC. = 1.25)
TC - From 84 PLF at 0.00 to 84 PLF at 22.58
BC - From 20 PLF at 0.00 to 20 PLF at 22.58
BC - 385 LB Conc. Load at 1.48, 3.48, 5.48, 7.48, 9.48
11.29, 13.10, 15.10, 17.10, 19.10, 21.10

In lieu of structural panels or rigid ceiling use purlins to brace TC @ 24" OC, BC @ 24" OC.



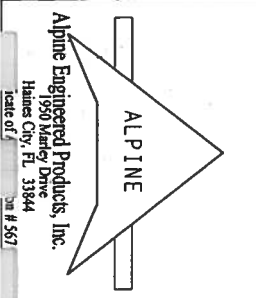
PLT TYP. 20 Gauge HS.Wave

Design Crit: TPI-2002(STD)/FBC
Cq/RT=1.00(1.25)/10(0)

7.24.1230

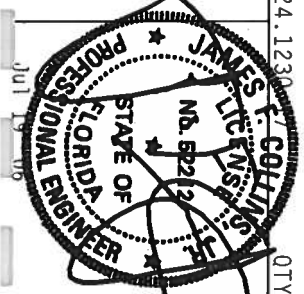
QTY: 2 FL/-77/-/R/-

Scale = .3125"/ft.



****WARNING**** TRUSSES REQUIRE EXTREME CARE IN FABRICATION, HANDLING, SHIPPING, INSTALLING AND BRACING. REFER TO BC31-03 (BUILDING COMPONENT SAFETY INFORMATION). PUBLISHED BY TPI (TRUSS PLATE INSTITUTE), 563 DORRIS DR., SUITE 200, MADISON, MI 48139 AND WCA (WOOD TRUSS COUNCIL OF AMERICA, 6400 ENTERPRISE LN., FARMINGTON, CT 06031) FOR BEST PRACTICES PRIOR TO PERFORMING THESE FUNCTIONS. UNLESS OTHERWISE INDICATED, TOP CHORD SHALL HAVE PROPERLY ATTACHED STRUCTURAL PANELS AND BOTTOM CHORD SHALL HAVE A PROPERLY ATTACHED RIGID CEILING.

****IMPORTANT**** FURNISH A COPY OF THIS DESIGN TO THE INSTALLATION CONTRACTOR. ALPINE ENGINEERING PRODUCTS, INC. SHALL NOT BE RESPONSIBLE FOR ANY DEVIATION FROM THIS DESIGN TO BUILD THE TRUSS IN CONFORMANCE WITH TPI: OR FABRICATING, HANDLING, SHIPPING, INSTALLING & BRACING OF TRUSSES. DESIGN CONFORMS WITH APPLICABLE PROVISIONS OF NDS (NATIONAL DESIGN SPEC. BY ANONY AND TPI). ALPINE CONNECTOR PLATES ARE MADE OF 20/18/16GA (W/H/S/K) ASTM A653 GRADE 40/60 (W. K/H/S) GALV. STEEL. APPLY PLATES TO EACH FACE OF TRUSS AND, UNLESS OTHERWISE LOCATED ON THIS DESIGN, POSITION PER DRAWINGS 160A-2. ANY INSPECTION OF PLATES FOLLOWED BY (1) SHALL BE PER ANNEX A3 OF TPI-2002 SEC.3. A SEAL ON THIS DRAWING INDICATES ACCEPTANCE OF PROFESSIONAL ENGINEERING RESPONSIBILITY SOLELY FOR THE TRUSS COMPONENT DESIGN SHOWN. THE SUITABILITY AND USE OF THIS COMPONENT FOR ANY BUILDING IS THE RESPONSIBILITY OF THE BUILDING DESIGNER PER ANSI/TPI 1 SEC. 2.



TC LL	24.0 PSF	REF R487-- 25848
TC DL	16.0 PSF	DATE 07/19/06
BC DL	10.0 PSF	DRW HCUSR487 06200028
BC LL	0.0 PSF	HC-ENG JB/AF
TOT.LD.	50.0 PSF	SEQN- 115822
DUR.FAC.	1.25	
SPACING	24.0"	JREF- 1521487 201

Top chord 2x4 SP #2 Dense
Bot chord 2x4 SP #2 Dense
Webs 2x4 SP #3

In lieu of structural panels or rigid ceiling use purlins to brace TC @ 24" OC, BC @ 24" OC.

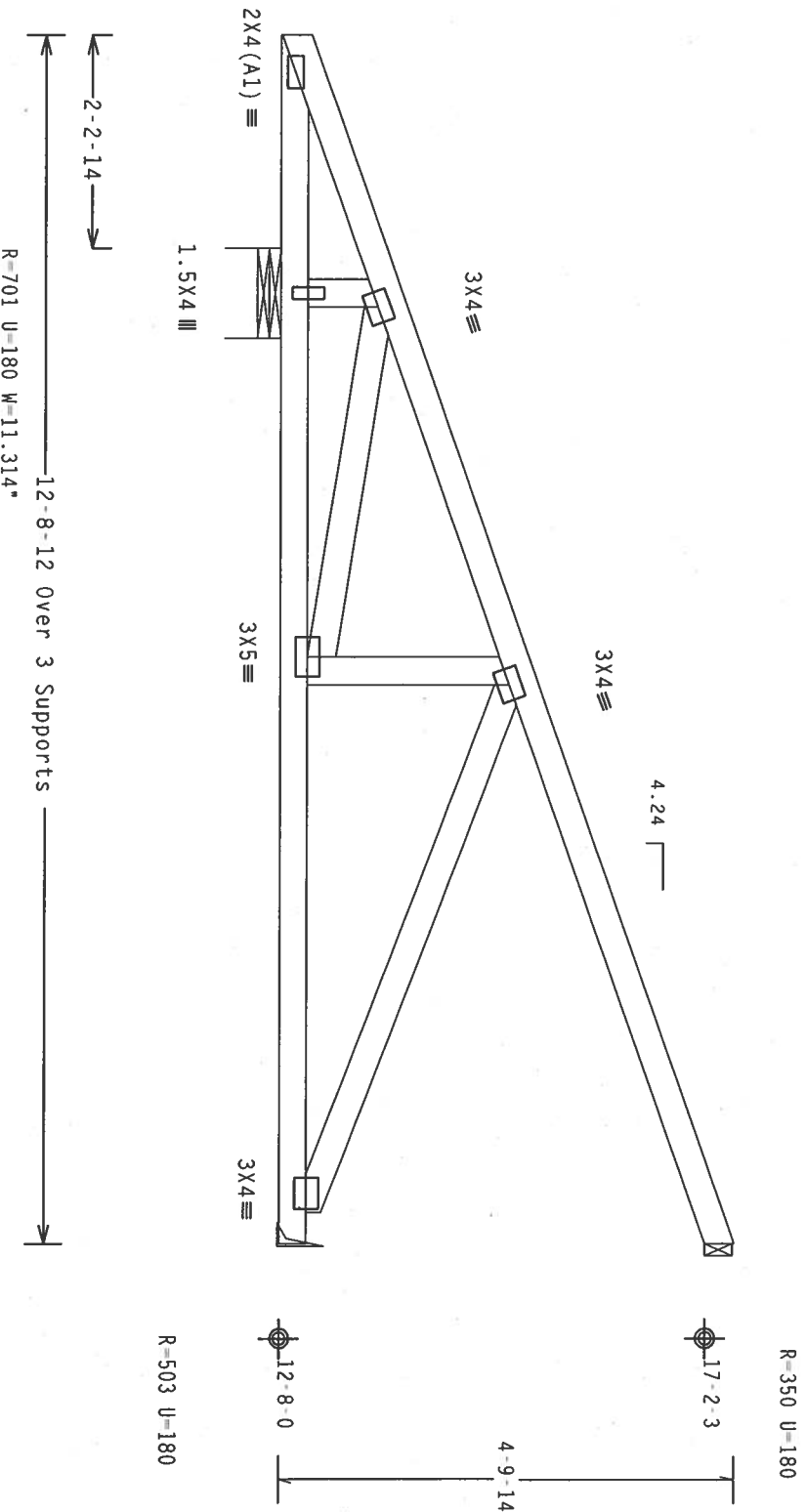
Sub-fascia beam assumptions: 5-0-0 sub-fascia beam on the 1-7-0 cantilever side. 5-0-0 sub-fascia beam on the 1-7-0 cantilever side.

Deflection meets L/360 live and L/240 total load. Creep increase factor for dead load is 1.50.

110 mph wind, 15.24 ft mean hgt, ASCE 7-02, CLOSED bldg, located anywhere in roof, CAT III OR IV, EXP B, wind TC DL=5.0 psf, wind BC DL=5.0 psf.

The following members need concentrated loads at the heel: 5-0-0 span/setback member on the 1-7-0 cant side requires 50 lbs and the 5-0-0 span/setback member on the 1-7-0 cant side requires 50 lbs.

Hi-jack supports 9-0-0 setback jacks with 1-7-0 cantilever one face; 1-7-0 cantilever opposite face.



PLT TYP. Wave

Design Crit: TPI-2002(STD)/FBC

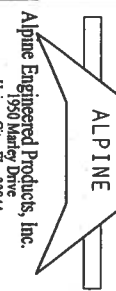
Cq/RT=1.00(1.25)/10(0) 7.24.1230

QTY: 4 FL/-/7/-/R/-

Scale = .5"/ft.

****WARNING**** TRUSSES REQUIRE EXTREME CARE IN FABRICATION, HANDLING, SHIPPING, INSTALLING AND BRACING. REFER TO BSI 1-03 (BUILDING COMPONENT SAFETY INFORMATION), PUBLISHED BY TPI TRUSS PLATE INSTITUTE, 583 MADISON ST. #3739, FORT WORTH, TEXAS 76102. AND AISC (STEEL CONSTRUCTION OF STEEL TRUSSES), 6300 ENTERPRISE LN, HOUSTON, TX 77036. FOR ADDITIONAL INFORMATION. UNLESS OTHERWISE INDICATED, TOP CHORD SHALL HAVE PROPERLY ATTACHED STRUCTURAL PANELS AND BOTTOM CHORD SHALL HAVE A PROPERLY ATTACHED RIGID CEILING.

****IMPORTANT**** FURNISH A COPY OF THIS DESIGN TO THE INSTALLATION CONTRACTOR. ALPINE ENGINEERED PRODUCTS, INC. SHALL NOT BE RESPONSIBLE FOR ANY DEVIATION FROM THIS DESIGN.



Alpine Engineered Products, Inc.
1950 Marley Drive
Haines City, FL 33844

Scale of 1/2" = 1'-0"

Sheet # 567

DATE: 07/19/06

DRW: HCUSR487 06200029

HC-ENG JB/AF

SEQN- 115805

DUR.FAC. 1.25

SPACING 24.0"

JREF- 1S21A87 201

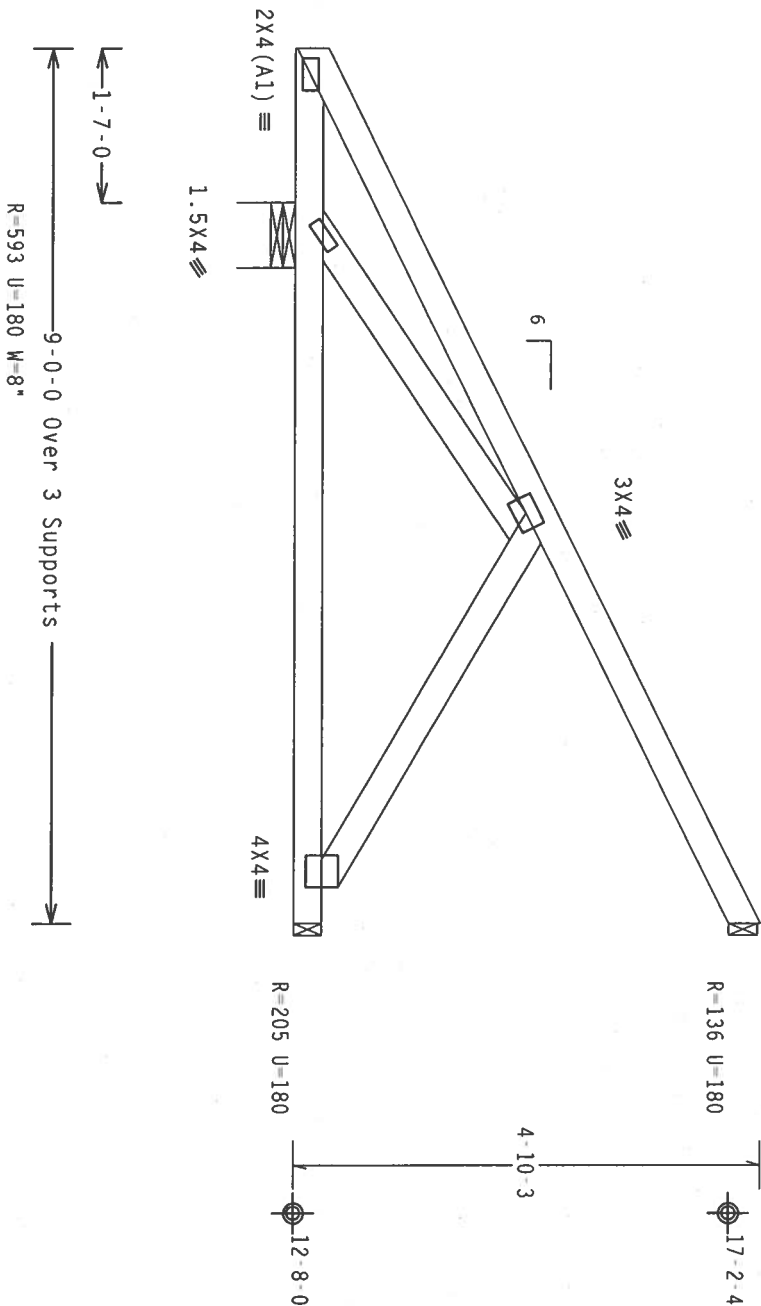
Top chord 2x4 SP #2 Dense
Bot chord 2x4 SP #2 Dense
Webs 2x4 SP #3

In lieu of structural panels or rigid ceiling use purlins to brace TC
@ 24" OC, BC @ 24" OC.

Provide (2) 16d common nails(0.162"x3.5"), toe nailed at Top chord.
Provide (2) 16d common nails(0.162"x3.5"), toe nailed at Bot chord.

110 mph wind, 15.26 ft mean hgt, ASCE 7-02, CLOSED bldg, not located
within 4.50 ft from roof edge, CAT III OR IV, EXP B, wind TC DL=5.0
psf, wind BC DL=5.0 psf.

Deflection meets L/360 live and L/240 total load. Creep increase
factor for dead load is 1.50.



PLT TYP. Wave

Design Crit: TPI-2002(STD)/FBC
Cq/RT=1.00(1.25)/10(0)

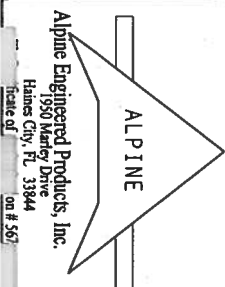
QTY: 8 FL/-/7/-/R/-

Scale = .5"/ft.

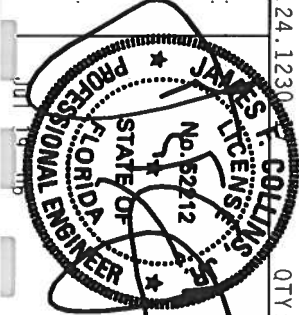
****WARNING**** TRUSSES REQUIRE EXTREME CARE IN FABRICATION, HANDLING, SHIPPING, INSTALLING AND BRACING. REFER TO BEST PRACTICES (BUILDING COMPONENT SAFETY INFORMATION), PUBLISHED BY TPI (TRUSS PLATE INSTITUTE, 5835 W. 11TH AVE., SUITE 100, DENVER, CO 80231) AND AISC (AMERICAN INSTITUTE OF STEEL CONSTRUCTION, INC., 500 N. MICHIGAN AVE., CHICAGO, IL 60610) FOR ADDITIONAL INFORMATION. UNLESS OTHERWISE INDICATED, TOP CHORD SHALL HAVE PROPERLY ATTACHED STRUCTURAL PANELS AND BOTTOM CHORD SHALL HAVE A PROPERLY ATTACHED RIGID CEILING.

****IMPORTANT**** FURNISH A COPY OF THIS DESIGN TO THE INSTALLATION CONTRACTOR.

ALPINE ENGINEERED PRODUCTS, INC. SHALL NOT BE RESPONSIBLE FOR ANY DEVIATION FROM THIS DESIGN. ANY FAILURE TO BUILD THE TRUSS IN CONFORMANCE WITH TPI OR FABRICATING, HANDLING, SHIPPING, INSTALLING & BRACING OF TRUSSES, DESIGN CONFORMS WITH APPLICABLE PROVISIONS OF NDS (NATIONAL DESIGN SPEC. BY AIAA) AND TPI. ALPINE CONNECTOR PLATES ARE MADE OF 20/18/16GA (W/H/S) ASTM A653 GRADE 40/60 (W, K/H/S) GALV. STEEL. APPLY PLATES TO EACH FACE OF TRUSS AND, UNLESS OTHERWISE LOCATED ON THIS DESIGN, POSITION PER DRAWINGS 160A-Z. ANY INSPECTION OF PLATES FOLLOWED BY (1) SHALL BE PER ANNEX A3 OF TPI-2002 SEC.3. A SEAL ON THIS DRAWING INDICATES ACCEPTANCE OF PROFESSIONAL ENGINEERING RESPONSIBILITY SOLELY FOR THE TRUSS COMPONENT DESIGN SHOWN. THE SUITABILITY AND USE OF THIS COMPONENT FOR ANY BUILDING IS THE RESPONSIBILITY OF THE BUILDING DESIGNER PER ANSI/TPI 1 SEC. 2.



ALPINE ENGINEERED PRODUCTS, INC.
1950 Marley Drive
Haines City, FL 33844
Scale of 1/8" = 1'-0"

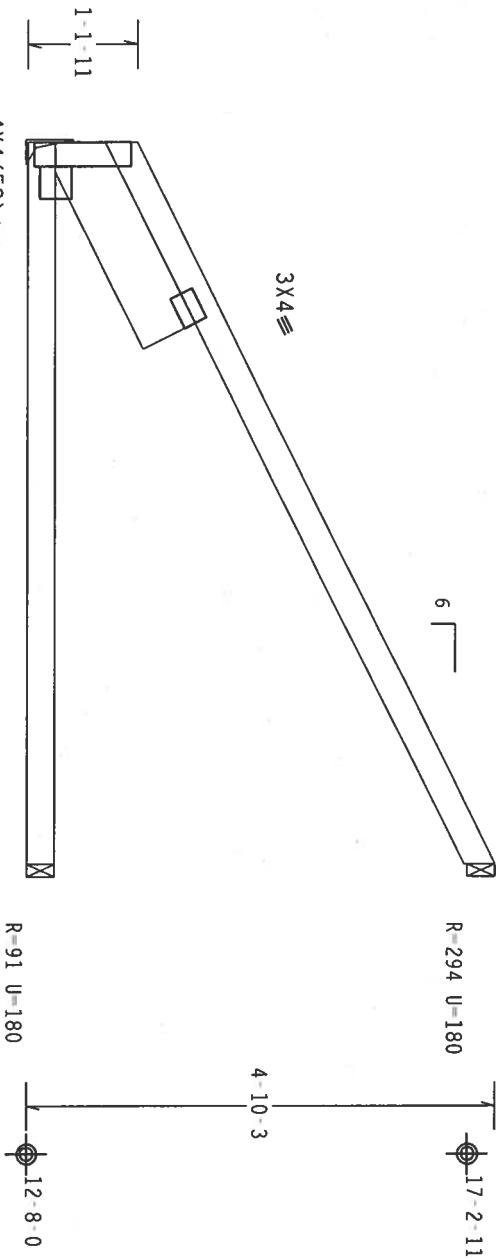


TC LL	24.0 PSF	REF R487 - 25850
TC DL	16.0 PSF	DATE 07/19/06
BC DL	10.0 PSF	DRW HCUSR487 06200033
BC LL	0.0 PSF	HC-ENG JB/AF
TOT.LD.	50.0 PSF	SEQN- 115768
DUR.FAC.	1.25	
SPACING	24.0"	

JREF- 1S21A87 201

Top chord 2x4 SP #2 Dense
 Bot chord 2x4 SP #2 Dense
 :lt Slider 2x8 SP #1 Dense: BLOCK LENGTH = 2.306'
 Calculated horizontal deflection is 0.16" due to live load and 0.29" due to dead load.
 Deflection meets L/360 live and L/240 total load. Creep increase factor for dead load is 1.50.

110 mph wind, 15.66 ft mean hgt, ASCE 7-02, CLOSED bldg, not located within 4.50 ft from roof edge, CAT III OR IV, EXP B, wind TC DL=5.0 psf, wind BC DL=5.0 psf.
 In lieu of structural panels or rigid ceiling use purlins to brace TC @ 24" OC, BC @ 24" OC.
 Provide (2) 16d common nails(0.162"x3.5"), toe nailed at Top chord. Provide (2) 16d common nails(0.162"x3.5"), toe nailed at Bot chord.



PLT TYP. Wave

Design Crit: TPI-2002(STD)/FBC
 Cq/RT=1.00(1.25)/10(0)

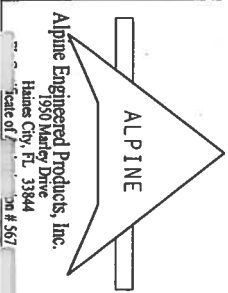
7.24.1230 E 07:22 PL-171-R/-

Scale = .5"/ft.

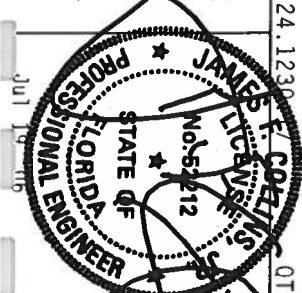
****WARNING**** TRUSSES REQUIRE EXTREME CARE IN FABRICATION, HANDLING, SHIPPING, INSTALLING AND BRACING. REFER TO BC31.03 (BUILDING COMPONENT SAFETY INFORMATION), PUBLISHED BY TPI TRUSS PLATE INSTITUTE, 563 HUNTER RD, SUITE 200, HUNTER, AL 35894, FOR TRUSS SAFETY INFORMATION. TRUSSES MUST BE PROPERLY BRACED TO PREVENT BUCKLING. TOP CHORD SHALL HAVE PROPERLY ATTACHED STRUCTURAL PANELS AND BOTTOM CHORD SHALL HAVE A PROPERLY ATTACHED RIGID CEILING.

****IMPORTANT**** FURNISH A COPY OF THIS DESIGN TO THE INSTALLATION CONTRACTOR.

ALPINE ENGINEERED PRODUCTS, INC. SHALL NOT BE RESPONSIBLE FOR ANY DEVIATION FROM THIS DESIGN. ANY FAILURE TO BUILD THE TRUSS IN CONFORMANCE WITH TPI: OR FABRICATING, HANDLING, SHIPPING, INSTALLING & BRACING OF TRUSSES. DESIGN CONFORMS WITH APPLICABLE PROVISIONS OF NDS (NATIONAL DESIGN SPEC. BY AREA) AND TPI. ALPINE PLATES TO EACH FACE OF TRUSS AND, UNLESS OTHERWISE LOCATED ON THIS DESIGN, POSITION PER DRAWINGS 160A-2. ANY INSPECTION OF PLATES FOLLOWED BY (1) SHALL BE PER ANNEX A3 OF TPI-2002 SEC.3.3. A SEAL ON THIS DRAWING INDICATES ACCEPTANCE OF PROFESSIONAL ENGINEERING RESPONSIBILITY SOLELY FOR THE TRUSS COMPONENT DESIGN SHOWN. THE SUITABILITY AND USE OF THIS COMPONENT FOR ANY BUILDING IS THE RESPONSIBILITY OF THE BUILDING DESIGNER PER ANSI/TPI 1 SEC. 2.



Alpine Engineered Products, Inc.
 1950 Marley Drive
 Haines City, FL 33844
 Phone 888-567-5677
 Fax 888-567-5678



TC LL	24.0 PSF	REF R487--	25851
TC DL	16.0 PSF	DATE	07/19/06
BC DL	10.0 PSF	DRW HCUSR487	06200027
BC LL	0.0 PSF	HC-ENG JB/AF	
TOT.LD.	50.0 PSF	SEON-	115777
DUR.FAC.	1.25		
SPACING	24.0"	JRFF-1S21A87	201

Top chord 2x4 SP #2 Dense
Bot chord 2x4 SP #2 Dense
Webs 2x4 SP #3

In lieu of structural panels or rigid ceiling use purlins to brace TC @ 24" OC, BC @ 24" OC.

Sub-fascia beam assumptions: 5-0-0 sub-fascia beam on the 1-8-14 cantilever side. 5-0-0 sub-fascia beam on the 1-8-14 cantilever side.

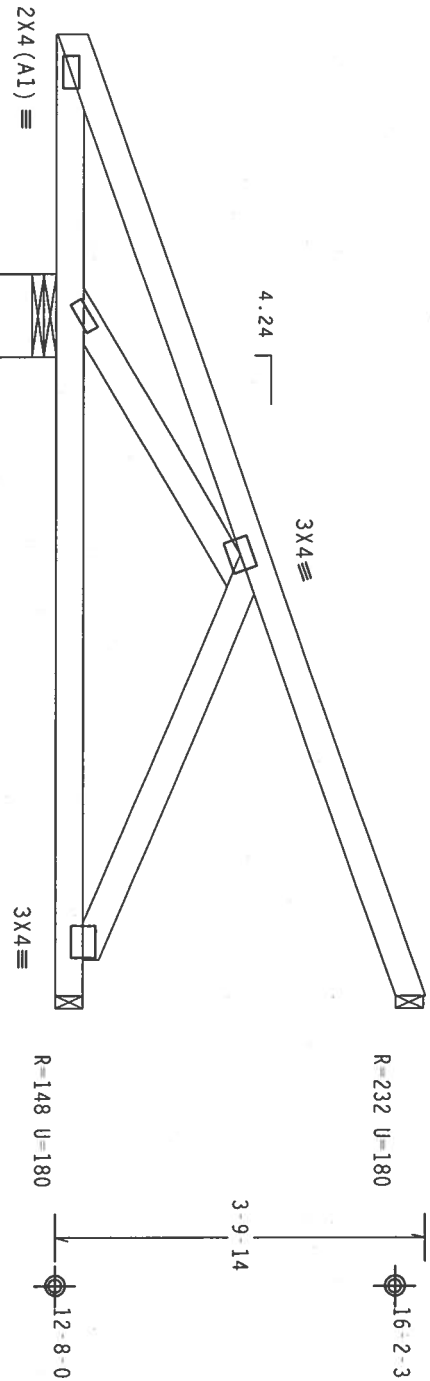
Deflection meets L/360 live and L/240 total load. Creep increase factor for dead load is 1.50.

110 mph wind, 15.00 ft mean hgt, ASCE 7-02, CLOSED bldg, located anywhere in roof, CAT III OR IV, EXP B, wind TC DL=5.0 psf, wind BC DL=5.0 psf.

The following members need concentrated loads at the heel: 5-0-0 span/setback member on the 1-8-14 cant side requires 54 lbs and the 5-0-0 span/setback member on the 1-8-14 cant side requires 54 lbs.

Hipjack supports 7-0-0 setback jacks with 1-8-14 cantilever one face; 1-8-14 cantilever opposite face.

Provide (2) 16d common nails(0.162"x3.5"), toe nailed at Top chord. Provide (2) 16d common nails(0.162"x3.5"), toe nailed at Bot chord.



2-5-8
9-10-13 Over 3 Supports
1.5X4
R=498 U=180 W=10.253"

PLT TYP. Wave

Design Crit: TPI-2002(STD)/FBC
Cq/RT=1.00(1.25)/10(0)

QTY: 2 FL/-/7/-/R/-

Scale = .5"/ft.

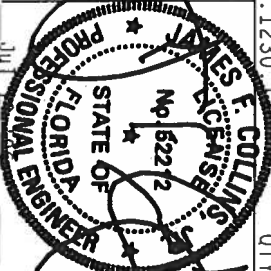
****WARNING**** TRUSSES REQUIRE EXTREME CARE IN FABRICATION, HANDLING, SHIPPING, INSTALLING AND BRACING. REFER TO BCSP 1-03 (BUILDING COMPONENT SAFETY INFORMATION), PUBLISHED BY TPI (TRUSS PLATE INSTITUTE), 563 D. GORDON DR., SUITE 200, MADISON, WI 53719, AND AISC (AMERICAN INSTITUTE OF STEEL CONSTRUCTION, INC.), 500 N. MERRILL ST., CHICAGO, IL 60610, FOR ADDITIONAL INFORMATION. TOP CHORD SHALL HAVE PROPERLY ATTACHED STRUCTURAL PANELS AND BOTTOM CHORD SHALL HAVE A PROPERLY ATTACHED RIGID CEILING.

****IMPORTANT**** FURNISH A COPY OF THIS DESIGN TO THE INSTALLATION CONTRACTOR. ALPINE ENGINEERING PRODUCTS, INC. SHALL NOT BE RESPONSIBLE FOR ANY DEVIATION FROM THIS DESIGN. ANY FAILURE TO BUILD THE TRUSS IN CONFORMANCE WITH TPI: OR FABRICATING, HANDLING, SHIPPING, INSTALLING & BRACING OF TRUSSES. DESIGN CONFORMS WITH APPLICABLE PROVISIONS OF NDS (NATIONAL DESIGN SPEC. BY AIAA) AND TPI. ALPINE PLATES TO EACH FACE OF TRUSS AND, UNLESS OTHERWISE LOCATED ON THIS DESIGN, POSITION PER DRAWINGS 160A, 2. ANY INSPECTION OF PLATES FOLLOWED BY (1) SHALL BE PER ANNEX A3 OF TPI-2002 SEC. 3. A SEAL ON THIS DRAWING INDICATES ACCEPTANCE OF PROFESSIONAL ENGINEERING RESPONSIBILITY SOLELY FOR THE TRUSS COMPONENT DESIGN SHOWN. THE SUITABILITY AND USE OF THIS COMPONENT FOR ANY BUILDING IS THE RESPONSIBILITY OF THE BUILDING DESIGNER PER ANSI/TPI 1 SEC. 2.

ALPINE

Alpine Engineering Products, Inc.
1950 Marley Drive
Haines City, FL 33844

Scale of: 1/8" = 1'-0"



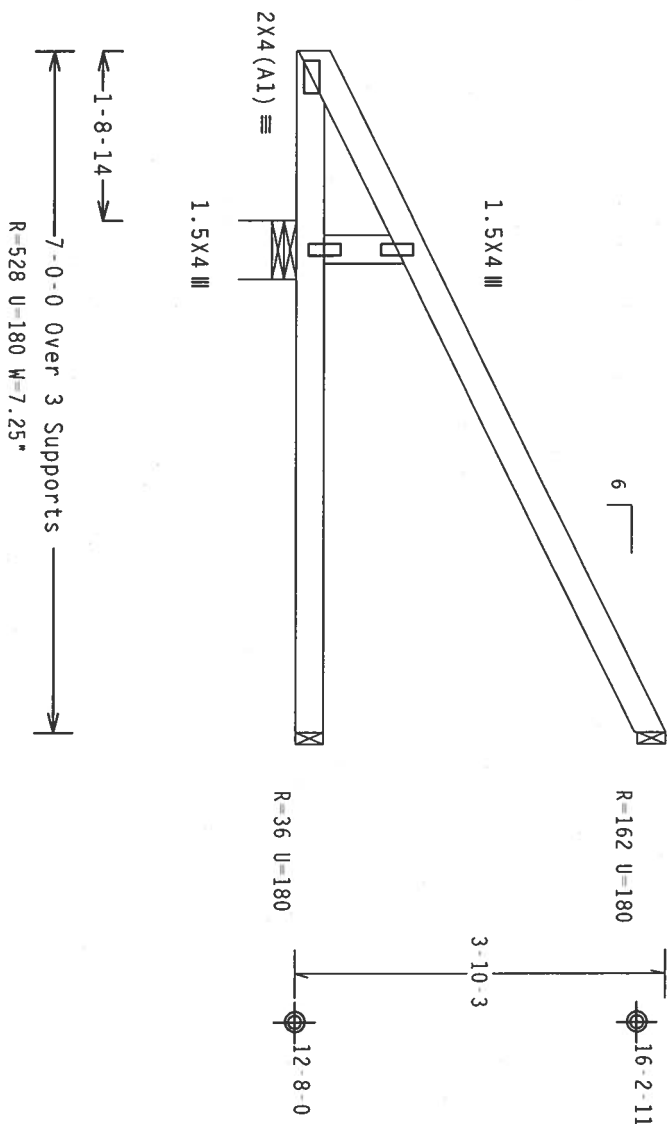
TC LL	24.0 PSF	REF R487-- 25852
TC DL	16.0 PSF	DATE 07/19/06
BC DL	10.0 PSF	DRW HCUSR487 06200002
BC LL	0.0 PSF	HC-ENG JB/AF
TOT.LD.	50.0 PSF	SEQN- 115869
DUR.FAC.	1.25	
SPACING	24.0"	JREF-1521A87 201

In lieu of structural panels or rigid ceiling use purlins to brace TC @ 24" OC, BC @ 24" OC.

Provide (2) 16d common nails(0.162"x3.5"), toe nailed at Top chord.
Provide (2) 16d common nails(0.162"x3.5"), toe nailed at Bot chord.

110 mph wind, 15.00 ft mean hgt, ASCE 7-02, CLOSED bldg, not located within 4.50 ft from roof edge, CAT III OR IV, EXP B, wind TC DL=5.0 psf, wind BC DL=5.0 psf.

Deflection meets $L/360$ live and $L/240$ total load. Creep increase factor for dead load is 1.50.



PLT TYP. Wave

Design Crit: TPI-2002(STD)/FBC
Cq/RT=1.00(1.25)

Cq/RT=1.00(1.25)/10(0)	7.24.1230

7.24.1230 TY·10 FL/-/7/-/-/R/-

Scale = .5"/Ft.



Alpine Engineered Products, Inc.
1950 Marley Drive
Haines City, FL 33844
Scale of / on # 567

WARNING: JOISSES REQUIRE EXTREME CARE IN FABRICATING, HANDLING, SHIPPING, INSTALLING AND BRACING. REFER TO RC51-1-70 (BUILDING COMPONENT SAFETY INFORMATION), PUBLISHED BY IPI (IRONUS PLATE INSTITUTE, 563 D'ONOFIO DR., SUITE 200, MADISON, NJ 07719) AND NICA (WOOD JOISSES COUNCIL OF AMERICA, 6300 ENTERPRISE LN, MADISON, NJ 07719) FOR SAFETY AND PROPER PRACTICES PRIOR TO PERFORMING THESE FUNCTIONS. UNLESS OTHERWISE INDICATED, FOR CHORD SHALL HAVE PROPERLY ATTACHED STRUCTURAL PANELS AND BOTTOM CHORD SHALL HAVE A PROPERLY ATTACHED TIGHTENING DEVICE. FOR CHORD CEILING.

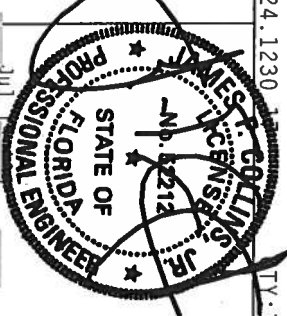
****IMPORTANT** FURNISH A COPY OF THIS DESIGN TO THE INSTALLATION CONTRACTOR.**

PRODUCTS, INC., SHALL NOT BE RESPONSIBLE FOR ANY DEVIATION FROM THIS DESIGN: ANY FAILURE TO BUILD THE TRUSS IN CONFORMANCE WITH TPI OR PARTICIPATING, HANDLING, SHIPPING, INSTALLING & BRACING OF TRUSSES DESIGN CONFORMS WITH APPLICABLE PROVISIONS OF NDS (NATIONAL DESIGN SPEC. BY AF&PA) AND TPI.

CONNECTOR PLATES ARE MADE OF 2017H18GALV (K HSK)	NDS A563	GALV	40X60	K	H/S	CALV	STEEL
							APPLY

PLATES TO EACH FACE OF TRUSS AND, UNLESS OTHERWISE LOCATED ON THIS DESIGN, POSITION PER DRAWINGS 160A-Z. ANY INSPECTION OF PLATES FOLLOWED BY (1) SHALL BE PER ANNEX A3 OF 1911-2002 SEC. 3. DRAWING INDICATES ACCEPTANCE OF PROFESSIONAL ENGINEERING RESPONSIBILITY SOLELY FOR THE TRUSS COMPONENT.

DESIGN SHOWN. THE SUITABILITY AND USE OF THIS COMPONENT FOR ANY BUILDING IS THE RESPONSIBILITY OF THE BUILDING DESIGNER PER ANSI/TP1 1 SEC. 2.



TC LL	24.0 PSF	REF	R487 - 25853
TC DL	16.0 PSF	DATE	07/19/06
BC DL	10.0 PSF	DRW	HCSR487 06200006
BC LL	0.0 PSF	HC-ENG	JB/AF
TOT.LD.	50.0 PSF	SEQN-	115862
DUR.FAC.	1.25		

Top chord 2x4 SP #2 Dense
Bot chord 2x4 SP #2 Dense
Webs 2x4 SP #3

In lieu of structural panels or rigid ceiling use purlins to brace TC
@ 24" OC, BC @ 24" OC.

Sub-fascia beam assumptions: 5-0-0 sub-fascia beam on the 1-7-0
cantilever side. 5-0-0 sub-fascia beam on the 1-7-0 cantilever side.

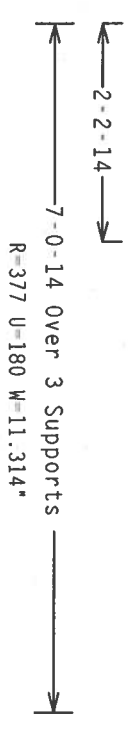
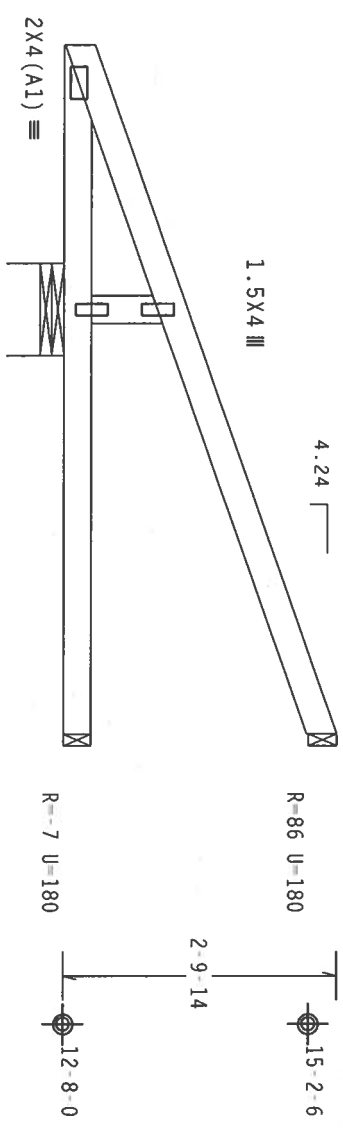
Deflection meets L/360 live and L/240 total load. Creep increase
factor for dead load is 1.50.

110 mph wind, 15.00 ft mean hgt, ASCE 7-02, CLOSED bldg, located
anywhere in roof, CAT III OR IV, EXP B, wind TC DL=5.0 psf, wind BC
DL=5.0 psf.

The following members need concentrated loads at the heel: 5-0-0
span/setback member on the 1-7-0 cant side requires 50 lbs and the
5-0-0 span/setback member on the 1-7-0 cant side requires 50 lbs.

Hipjack supports 5-0-0 setback jacks with 1-7-0 cantilever one face;
1-7-0 cantilever opposite face.

Provide (2) 16d common nails(0.162"x3.5"), toe nailed at Top chord.
Provide (2) 16d common nails(0.162"x3.5"), toe nailed at Bot chord.



PLT TYP. Wave

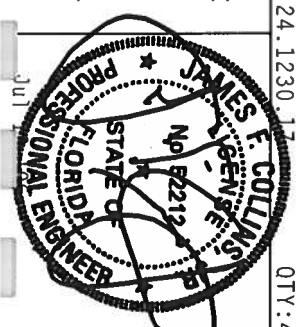
Design Crit: TPI-2002(STD)/FBC
Cq/RT=1.00(1.25)/10(0)

QTY: 4 FL/-/7/-/R/-

Scale = .5"/Ft.

****WARNING**** TRUSSES REQUIRE EXTREME CARE IN FABRICATION, HANDLING, SHIPPING, INSTALLING AND BRACING.
REFER TO BEST PRACTICES (BOLTING COMPONENT SAFETY INFORMATION, PUBLISHED BY TPI (TRUSS PLATE INSTITUTE, 565
N. 10TH ST., SUITE 100, WISCONSIN, WI 53719) FOR SAFETY PRACTICES PRIOR TO REPAIRING TRUSSES. TRUSSES SHOULD BE
MAINTAINED IN THE SAME CONDITION AS WHEN THEY WERE MANUFACTURED. TOP CHORD SHALL HAVE PROPERLY ATTACHED STRUCTURAL PANELS AND BOTTOM CHORD SHALL HAVE A PROPERLY ATTACHED
RIGID CEILING.

****IMPORTANT**** FURNISH A COPY OF THIS DESIGN TO THE INSTALLATION CONTRACTOR. ALPINE ENGINEERED
PRODUCTS, INC. SHALL NOT BE RESPONSIBLE FOR ANY DEVIATION FROM THIS DESIGN. ANY FAILURE TO BUILD THE
TRUSS IN CONFORMANCE WITH TPI: OR FABRICATING, HANDLING, SHIPPING, INSTALLING & BRACING OF TRUSSES,
DESIGN CONFORMS WITH APPLICABLE PROVISIONS OF NDS (NATIONAL DESIGN SPEC. BY AF&A) AND TPI. ALPINE
CONNECTOR PLATES ARE MADE OF 20/18/16GA (W/H/S/K) ASTM A653 GRADE 40/60 (W. K/H/S) GALV. STEEL. APPLY
PLATES TO EACH FACE OF TRUSS AND, UNLESS OTHERWISE LOCATED ON THIS DESIGN, POSITION PER DRAWINGS 160A-2.
ANY INSPECTION OF PLATES FOLLOWED BY (1) SHALL BE PER ANNEX A3 OF TPI-2002 SEC.3.3. A SEAL ON THIS
DRAWING INDICATES ACCEPTANCE OF PROFESSIONAL ENGINEERING RESPONSIBILITY SOLELY FOR THE TRUSS COMPONENT
DESIGN SHOWN. THE SUITABILITY AND USE OF THIS COMPONENT FOR ANY BUILDING IS THE RESPONSIBILITY OF THE
BUILDING DESIGNER PER ANSI/TPI 1 SEC. 2.



TC LL	24.0 PSF	REF	R487-- 25854
TC DL	16.0 PSF	DATE	07/19/06
BC DL	10.0 PSF	DRW	HCUSR487 06200009
BC LL	0.0 PSF	HC-ENG	JB/AF
TOT.LD.	50.0 PSF	SEQN-	115791
DUR.FAC.	1.25		
SPACING	24.0"		

JREF-1S21A87 201

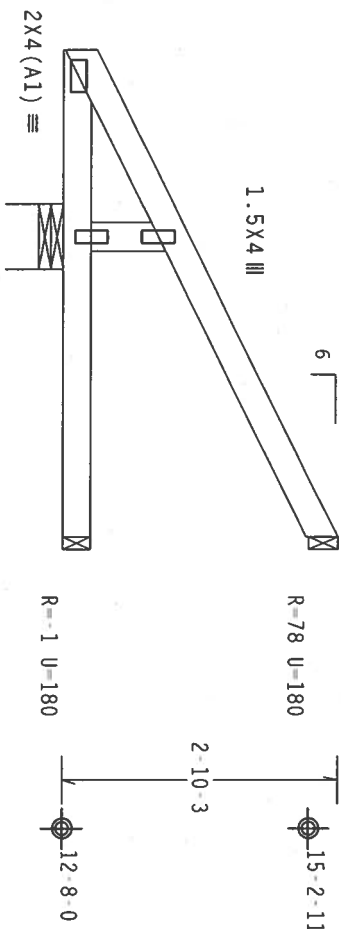
Top chord 2x4 SP #2 Dense
Bot chord 2x4 SP #2 Dense
Webs 2x4 SP #3

In lieu of structural panels or rigid ceiling use purlins to brace TC
@ 24" OC, BC @ 24" OC.

Provide (2) 16d common nails(0.162"x3.5"), toe nailed at Top chord.
Provide (2) 16d common nails(0.162"x3.5"), toe nailed at Bot chord.

110 mph wind, 15.00 ft mean hgt, ASCE 7-02, CLOSED bldg, not located
within 4.50 ft from roof edge, CAT III OR IV, EXP B, wind TC DL=5.0
psf, wind BC DL=5.0 psf.

Deflection meets L/360 live and L/240 total load. Creep increase
factor for dead load is 1.50.



1-7-0
5-0-0 over 3 Supports
R=442 U=180 W=8"

PLT TYP. Wave

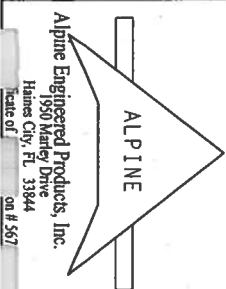
Design Crit: TPI-2002(STD)/FBC
Cq/RT=1.00(1.25)/10(0)

QTY:15 FL/-/7/-/R/-

Scale = .5"/Ft.

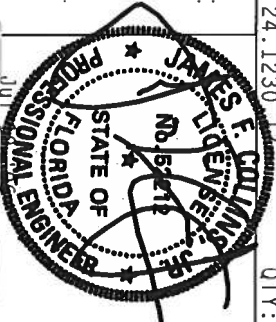
****WARNING**** TRUSSES REQUIRE EXTREME CARE IN FABRICATION, HANDLING, SHIPPING, INSTALLING AND BRACING. REFER TO BC31-03 (BUILDING COMPONENT SAFETY INFORMATION), PUBLISHED BY TPI (TRUSS PLATE INSTITUTE, 583 MADISON DR., SUITE 200, MADISON, WI 53715) AND WCA (WOOD TRUSS COUNCIL OF AMERICA, 6300 ENTERPRISE LN., MADISON, WI 53711) FOR ADDITIONAL TRUSS GUIDELINES. UNLESS OTHERWISE INDICATED, TOP CHORD SHALL HAVE PROPERLY ATTACHED STRUCTURAL PANELS AND BOTTOM CHORD SHALL HAVE A PROPERLY ATTACHED RIGID CEILING.

****IMPORTANT**** FURNISH A COPY OF THIS DESIGN TO THE INSTALLATION CONTRACTOR. ALPINE ENGINEERED PRODUCTS, INC. SHALL NOT BE RESPONSIBLE FOR ANY DEVIATION FROM THIS DESIGN. ANY FAILURE TO BUILD THE TRUSS IN CONFORMANCE WITH TPI OR FABRICATING, HANDLING, SHIPPING, INSTALLING & BRACING OF TRUSSES, DESIGN CONFORMS WITH APPLICABLE PROVISIONS OF NDS (NATIONAL DESIGN SPEC. BY AF&PA) AND TPI. ALPINE DESIGN CONFORMS WITH APPLICABLE PROVISIONS OF NDS (NATIONAL DESIGN SPEC. BY AF&PA) AND TPI. ALPINE PLATES TO EACH FACE OF TRUSS AND, UNLESS OTHERWISE LOCATED ON THIS DESIGN, POSITION PER DRAWINGS 160A-Z. ANY INSPECTION OF PLATES FOLLOWED BY (1) SHALL BE PER ANNEX A3 OF TPI-2002 SEC.3. A SEAL ON THIS DRAWING INDICATES ACCEPTANCE OF PROFESSIONAL ENGINEERING RESPONSIBILITY SOLELY FOR THE TRUSS COMPONENT DESIGN SHOWN. THE SUITABILITY AND USE OF THIS COMPONENT FOR ANY BUILDING IS THE RESPONSIBILITY OF THE BUILDING DESIGNER PER ANSI/TPI 1 SEC. 2.



Alpine Engineered Products, Inc.
1950 Marley Drive
Haines City, FL 33844

Scale of 1/8"=1'-0"



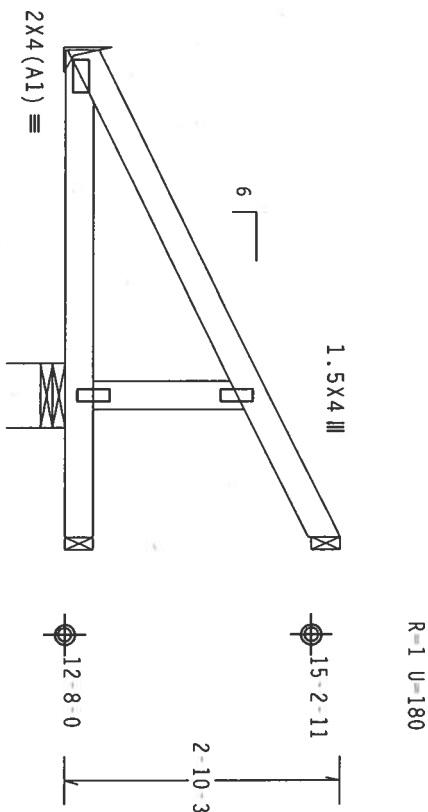
TC LL	24.0 PSF	REF R487--	25855
TC DL	16.0 PSF	DATE	07/19/06
BC DL	10.0 PSF	DRW HCUSR487	06200012
BC LL	0.0 PSF	HC-ENG JB/AF	
TOT.LD.	50.0 PSF	SEON-	115735
DUR.FAC.	1.25		
SPACING	24.0"		

JRFF-1S21487 201

Top chord 2x4 SP #2 Dense
Bot chord 2x4 SP #2 Dense
Webs 2x4 SP #3

In lieu of structural panels or rigid ceiling use purlins to
brace TC @ 24" OC, BC @ 24" OC.

110 mph wind, 15.00 ft mean hgt, ASCE 7-02, CLOSED bldg, not
located within 4.50 ft from roof edge, CAT III OR IV, Exp B, wind
TC DL=5.0 psf, wind BC DL=5.0 psf.
Deflection meets L/360 live and L/240 total load. Creep increase
factor for dead load is 1.50.



5-0-0 Over 4 Supports
R-168 U-180 R-365 U-180 W-8"

PLT TYP. Wave

Design Crit: TPI-2002(STD)/FBC
Cq/RT=1.00(1.25)/10(0)

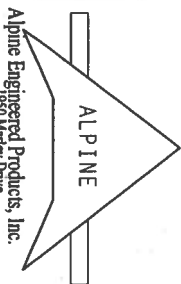
7.24.1230 4 COLLING QTY:3 FL/-/7/-/R/-

Scale = .5"/ft.

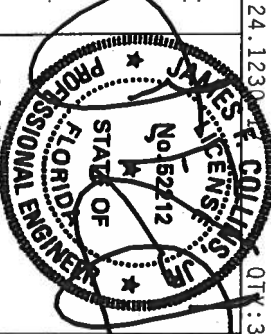
****WARNING**** TRUSSES REQUIRE EXTREME CARE IN FABRICATION, HANDLING, SHIPPING, INSTALLING AND BRACING. REFER TO BC31.1 (0) BUILDING COMPONENT SAFETY, FABRICATION, HANDLING, SHIPPING, INSTALLING & BRACING OF TRUSSES. D'ONOFRI DR., SUITE 200, MADISON, WI 53719) AND WICK (WOOD TRUSS CONNECT, OF AMERICA, 6300 ENTERPRISE DR., MADISON, WI 53719) FOR SAFETY PRACTICES PRIOR TO PERFORMING THESE FUNCTIONS. UNLESS OTHERWISE INDICATED, TOP CHORD SHALL HAVE PROPERLY ATTACHED STRUCTURAL PANELS AND BOTTOM CHORD SHALL HAVE A PROPERLY ATTACHED RIGID CEILING.

****IMPORTANT**** FURNISH A COPY OF THIS DESIGN TO THE INSTALLATION CONTRACTOR.

PRODUCTS, INC. SHALL NOT BE RESPONSIBLE FOR ANY DEVIATION FROM THIS DESIGN. ANY FAILURE TO BUILD THE TRUSS IN CONFORMANCE WITH TPI: OR FABRICATING, HANDLING, SHIPPING, INSTALLING & BRACING OF TRUSSES. DESIGN CONFORMS WITH APPLICABLE PROVISIONS OF NDS (NATIONAL DESIGN SPEC. BY AF&PA) AND TPI. ALPINE CONNECTOR PLATES ARE MADE OF 20/18/16GA (W/H/S) GALV. STEEL. APPLY PLATES TO EACH FACE OF TRUSS AND, UNLESS OTHERWISE LOCATED ON THIS DESIGN, POSITION PER DRAWINGS 160A-Z. ANY INSPECTION OF PLATES FOLLOWED BY (1) SHALL BE PER AMEX AS OF TPI-2002 SEC.3. A SEAL ON THIS DRAWING INDICATES ACCEPTANCE OF PROFESSIONAL ENGINEERING RESPONSIBILITY SOLELY FOR THE TRUSS COMPONENT DESIGN SHOWN. THE SUSTAINABILITY AND USE OF THIS COMPONENT FOR ANY BUILDING IS THE RESPONSIBILITY OF THE BUILDING DESIGNER PER ANSI/TPI 1 SEC. 2.



Alpine Engineering Products, Inc.
1950 Marley Drive
Haines City, FL 33844
Phone # 888-567-5671



TC LL	24.0 PSF	REF R487-- 25856
TC DL	16.0 PSF	DATE 07/19/06
BC DL	10.0 PSF	DRW HCUSR487 06200013
BC LL	0.0 PSF	HC-ENG JB/AF
TOT.LD.	50.0 PSF	SEON- 115838
DUR.FAC.	1.25	
SPACING	24.0"	JREF- 1S21487 Z01

110 mph wind, 15.00 ft mean hgt, ASCE 7-02, CLOSED bldg, not located within 4.50 ft from roof edge, CAT III OR IV, EXP B, wind TC DL=5.0 psf, wind BC DL=5.0 psf.

Deflection meets $L/360$ live and $L/240$ total load. Creep increase factor for dead load is 1.50.

Deflection meets $L/360$ live and $L/240$ total load. Creep increase factor for dead load is 1.50.



7.24.1230-12 COL/FL/77/11/R/

Scale = .5" / Ft.

James L. ENSB.
No. B2212

...

PATIENT

FLORIDIAN

Jul 16 1976

REF	R487-- 25857
DATE	07/19/06
DRW	HCUSR487 06200031
HC-ENG	JB/AF
SEQN-	115760
TOT.LD.	50.0 PSF
BC LL	0.0 PSF
BC DL	10.0 PSF
TC DL	16.0 PSF
CL LL	24.0 PSF
OUR.FAC.	1.25
SPACING	24.0"
JREF-	1SZ1487 Z01

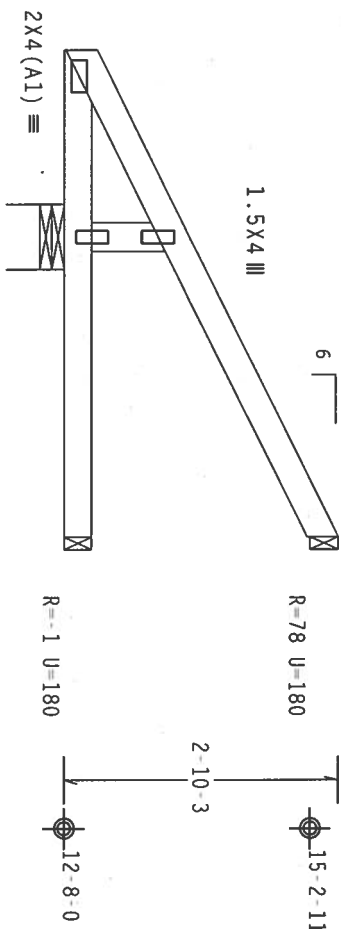
Top chord 2x4 SP #2 Dense
Bot chord 2x4 SP #2 Dense
Webs 2x4 SP #3

In lieu of structural panels or rigid ceiling use purtins to brace TC
@ 24" OC, BC @ 24" OC.

Provide (2) 16d common nails(0.162"x3.5"), toe nailed at Top chord.
Provide (2) 16d common nails(0.162"x3.5"), toe nailed at Bot chord.

110 mph wind, 15.00 ft mean hgt, ASCE 7-02, CLOSED bldg, not located
within 4.50 ft from roof edge, CAT III OR IV, EXP B, wind TC DL=5.0
psf, wind BC DL=5.0 psf.

Deflection meets L/360 live and L/240 total load. Creep increase
factor for dead load is 1.50.



←1-7-0→
←5-0-0 Over 3 Supports →
R=442 U=180 W=8"

PLT TYP. Wave

Design Crit: TPI-2002(STD)/FBC
Cq/RT=1.00(1.25)/10(0)

7.24.1230

FL/-/7/-/R/-

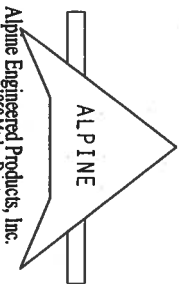
Scale = .5"/Ft.

WARNING TRUSSES REQUIRE EXTREME CARE IN FABRICATION, HANDLING, SHIPPING, INSTALLING AND BRACING.
REFER TO BC31-03 (BUILDING COMPONENT SAFETY INFORMATION), PUBLISHED BY TPI (TRUSS PLATE INSTITUTE), 163
NORTH 20TH AVE., SUITE 200, FORT LAUDERDALE, FL 33304 AND TPI (TRUSS PLATE INSTITUTE), 163
NORTH 20TH AVE., SUITE 200, FORT LAUDERDALE, FL 33304 AND TPI (TRUSS PLATE INSTITUTE), 163
NORTH 20TH AVE., SUITE 200, FORT LAUDERDALE, FL 33304. TOP CHORD SHALL HAVE PROPERLY ATTACHED STRUCTURAL PANELS AND BOTTOM CHORD SHALL HAVE A PROPERLY ATTACHED
RIGID CEILING.

IMPORTANT FURNISH A COPY OF THIS DESIGN TO THE INSTALLATION CONTRACTOR. ALPINE ENGINEERED
PRODUCTS, INC. SHALL NOT BE RESPONSIBLE FOR ANY DEVIATION FROM THIS DESIGN. ANY FAILURE TO BUILD THE
TRUSS IN CONFORMANCE WITH TPI: OR FABRICATING, HANDLING, SHIPPING, INSTALLING & BRACING OF TRUSSES.

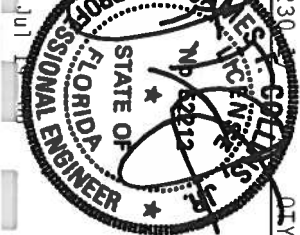
DESIGN COMPONENTS WITH APPLICABLE PROVISIONS OF AISC (NATIONAL DESIGN SPEC. BY AISC), AND TPI. ALPINE
CONNECTOR PLATES ARE MADE OF 2018/16GA (N/A/S/X) ASTM A653 GRADE 40/60 (K, K/H, S) GALV. STEEL. APPLY
PLATES TO EACH FACE OF TRUSS AND, UNLESS OTHERWISE LOCATED ON THIS DESIGN, POSITION PER DRAWINGS 160A-Z.

ANY INSPECTION OF PLATES FOLLOWED BY (1) SHALL BE PER ANNEX A3 OF TPI 11-2002 SEC.3. A SEAL ON THIS
DRAWING INDICATES ACCEPTANCE OF PROFESSIONAL ENGINEERING RESPONSIBILITY SOLELY FOR THE TRUSS COMPONENT
DESIGN SHOWN. THE SUITABILITY AND USE OF THIS COMPONENT FOR ANY BUILDING IS THE RESPONSIBILITY OF THE
BUILDING DESIGNER PER ANSI/TPI 1 SEC. 2.



Alpine Engineered Products, Inc.
1630 North Drive
Haines City, FL 33844

Scale of 1/2" = 1'-0"



TC LL	24.0 PSF	REF R487- 25858
TC DL	16.0 PSF	DATE 07/19/06
BC DL	10.0 PSF	DRW HCUR487 06200032
BC LL	0.0 PSF	HC-ENG JB/AF
TOT.LD.	50.0 PSF	SEON- 115753
DUR.FAC.	1.25	
SPACING	24.0"	

DRW - 1S21/87 Z01

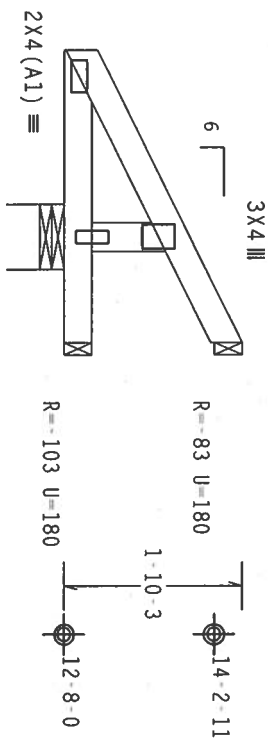
Top chord 2x4 SP #2 Dense
Bot chord 2x4 SP #2 Dense
Webs 2x4 SP #3

In lieu of structural panels or rigid ceiling use purlins to brace TC
@ 24" OC, BC @ 24" OC.

Provide (2) 16d common nails(0.162"x3.5"), toe nailed at Top chord.
Provide (2) 16d common nails(0.162"x3.5"), toe nailed at Bot chord.

110 mph wind, 15.00 ft mean hgt, ASCE 7-02, CLOSED bldg, located
anywhere in roof, CAT III OR IV, EXP B, wind TC DL=5.0 psf, wind BC
DL=5.0 psf.

Deflection meets L/360 live and L/240 total load. Creep increase
factor for dead load is 1.50.



←1-7-0→
3-0-0 Over 3 Supports
R=498 U=180 W=8"

PLT TYP. Wave

Design Crit: TPI-2002(STD)/FBC
Cq/RT=1.00(1.25)/10(0)

7.24.1230

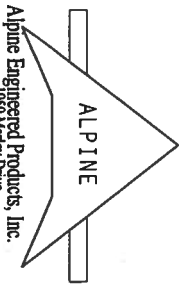
QTY:20 FL/-/7/-/R/-

Scale =.5"/Ft.

****WARNING**** TRUSSES REQUIRE EXTREME CARE IN FABRICATION, HANDLING, SHIPPING, INSTALLING AND BRACING. PRODUCTS, INC. SHALL NOT BE RESPONSIBLE FOR ANY DEVIATION FROM THIS DESIGN. ANY FAILURE TO BUILD THE TRUSS IN CONFORMANCE WITH TPI: ON FABRICATING, HANDLING, SHIPPING, INSTALLING & BRACING OF TRUSSES DESIGNER'S RESPONSIBILITY. THE SUITABILITY AND USE OF THIS COMPONENT FOR ANY BUILDING IS THE RESPONSIBILITY OF THE BUILDING DESIGNER PER ANSI/TPI 1 SEC. 2.

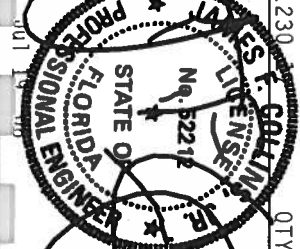
****IMPORTANT**** FURNISH A COPY OF THIS DESIGN TO THE INSTALLATION CONTRACTOR. ALPINE ENGINEERED PRODUCTS, INC. SHALL NOT BE RESPONSIBLE FOR ANY DEVIATION FROM THIS DESIGN. ANY FAILURE TO BUILD THE TRUSS IN CONFORMANCE WITH TPI: ON FABRICATING, HANDLING, SHIPPING, INSTALLING & BRACING OF TRUSSES DESIGNER'S RESPONSIBILITY. THE SUITABILITY AND USE OF THIS COMPONENT FOR ANY BUILDING IS THE RESPONSIBILITY OF THE BUILDING DESIGNER PER ANSI/TPI 1 SEC. 2.

ALPINE



Alpine Engineered Products, Inc.
1550 Mundy Drive
Haines City, FL 33844

Scale of 1/2" = 1'-0"



TC LL	24.0 PSF	REF R487--	25859
TC DL	16.0 PSF	DATE	07/19/06
BC DL	10.0 PSF	DRW HCUR487	06200010
BC LL	0.0 PSF	HC-ENG JB/AF	
TOT.LD.	50.0 PSF	SEON-	115739
DIR.FAC.	1.25		
SPACING	24.0"		

JREF-1S21487 201

Top chord 2x4 SP #2 Dense
Bot chord 2x4 SP #2 Dense

110 mph wind, 15.00 ft mean hgt. ASCE 7-02, CLOSED bldg, located
anywhere in roof, CAT III OR IV, EXP B, wind TC DL=5.0 psf, wind BC
DL=5.0 psf.

Deflection meets L/360 live and L/240 total load. Creep increase
factor for dead load is 1.50.

SPECIAL LOADS

----- (LUMBER DUR.FAC.=1.25 / PLATE DUR.FAC.=1.25)
TC - From 84 PLF at 0.00 to 84 PLF at 1.00
BC - From 4 PLF at 0.00 to 4 PLF at 1.00

In lieu of structural panels or rigid ceiling use purlins to brace TC
@ 24" OC, BC @ 24" OC.

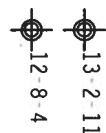
Provide (2) 16d common nails(0.162"x3.5"), toe nailed at Top chord.
Provide (2) 16d common nails(0.162"x3.5"), toe nailed at Bot chord.

6

R-44 U-180



R-32 U-180
R-12 U-180



0-10-3



1-0-0 Over 3 Supports

PLT TYP. Wave

Design Crit: TPI-2002(STD)/FBC
Cq/RT=1.00(1.25)/10(0)

7.24.1230

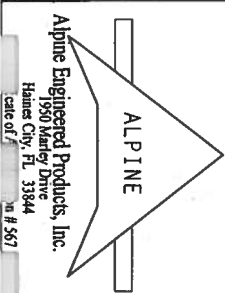
QTY:20 FL/-/7/-/R/-

Scale = .5"/ft.

****WARNING**** TRUSSES REQUIRE EXTREME CARE IN FABRICATING, HANDLING, SHIPPING, INSTALLING AND BRACING.
REFER TO BC31-03 (BUILDING COMPONENT SAFETY INFORMATION), PUBLISHED BY TPI (TRUSS PLATE INSTITUTE), 583
DODORIO DR., SUITE 200, MADISON, WI 53715) AND WCA (WOOD TRUSS COUNCIL OF AMERICA, 6300 ENTERPRISE LN,
INDIANAPOLIS, IN 46226) FOR TRUSS DESIGN, FABRICATING, HANDLING, SHIPPING, INSTALLING AND BRACING.
TOP CHORD SHALL HAVE PROPERLY ATTACHED STRUCTURAL PANELS AND BOTTOM CHORD SHALL HAVE A PROPERLY ATTACHED
RIGID CEILING.

****IMPORTANT**** FURNISH A COPY OF THIS DESIGN TO THE INSTALLATION CONTRACTOR.

PRODUCTS, INC. SHALL NOT BE RESPONSIBLE FOR ANY DEVIATION FROM THIS DESIGN. ALPINE ENGINEERING
DESIGN CONFORMS WITH TPI: OR FABRICATING, HANDLING, SHIPPING, INSTALLING & BRACING OF TRUSSES
DESIGN CONFORMS WITH APPLICABLE PROVISIONS OF NDS (NATIONAL DESIGN SPEC. BY AF&PA) AND TPI. ALPINE
CONNECTOR PLATES ARE MADE OF 20/18/16GA (W/H/S/K) ASTM A653 GRADE 40/60 (W, K/H/S) GALV. STEEL. APPLY
PLATES TO EACH FACE OF TRUSS AND, UNLESS OTHERWISE LOCATED ON THIS DESIGN, POSITION PER DRAWINGS 160A-Z.
ANY INSPECTION OF PLATES FOLLOWED BY (1) SHALL BE PER ANNEX A3 OF TPI-2002 SEC.3. A SEAL ON THIS
DRAWING INDICATES ACCEPTANCE OF PROFESSIONAL ENGINEERING RESPONSIBILITY SOLELY FOR THE TRUSS COMPONENT
DESIGN SHOWN. THE SUITABILITY AND USE OF THIS COMPONENT FOR ANY BUILDING IS THE RESPONSIBILITY OF THE
BUILDING DESIGNER PER ANSI/TPI 1 SEC. 2.



Alpine Engineered Products, Inc.
1950 Marley Drive
Haines City, FL 33844
Date of: 7/19/06
Job # 567



TC LL	24.0 PSF	REF R487-- 25860
TC DL	16.0 PSF	DATE 07/19/06
BC DL	10.0 PSF	DRW HCUR487 06200005
BC LL	0.0 PSF	HC-ENG JB/AF
TOT.LD.	50.0 PSF	SEON- 115748
DUR.FAC.	1.25	
SPACING	24.0"	

JREF- 1S21487 201

Webs 2x4 SP #3

In lieu of structural panels or rigid ceiling use purlins to
110 mph wind, 15.00 ft mean hgt, ASCE 7-02, CLOSED bldg, located
anywhere in roof, CAT III OR IV, EXP B, wind TC DL=5.0 psf, wind
BC DL=5.0 psf.

In lieu of structural panels or rigid ceiling use purlins to brace TC @ 24" OC, BC @ 24" OC.

Deflection meets $L/360$ live and $L/240$ total load. Creep increase factor for dead load is 1.50.

+ MEMBER TO BE Laterally Braced for Wind Loads Perpendicular to Truss. Bracing System to be Designed and Furnished by Others.

THE BUILDING DESIGNER IS RESPONSIBLE FOR THE DESIGN OF THE ROOF AND CEILING DIAPHRAGMS, GABLE END SHEAR WALLS, AND SUPPORTING SHEAR WALLS. SHEAR WALLS MUST PROVIDE CONTINUOUS LATERAL RESTRAINT TO THE GABLE END. ALL CONNECTIONS TO BE DESIGNED BY THE BUILDING DESIGNER.



Design Crit: TPI-2002(STD)/FBC

$$C_q/RT=1.00(1.25)/10(0)$$

FL/1-171-1-1R1-

Scale = .5" / Ft.

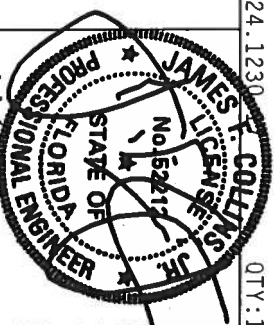
NO. 152217

****IMPORTANT** FURNISH A COPY OF THIS DESIGN TO THE INSTALLATION CONTRACTOR**

ALPINE

Alpine Engineered Products, Inc.

Haines City, FL 33844
 Ticate of / on # 567



TC LL	24.0 PSF	REF	R487 - 25861
TC DL	16.0 PSF	DATE	07/19/06
BC DL	10.0 PSF	DRW	HCUSR487 06200035
BC LL	0.0 PSF	HC-ENG	JB/AF
TOT.LD.	50.0 PSF	SEQN-	115851 REV
DUR.FAC.	1.25		
SPACING	24.0"	JRFF-	1S21487 Z01

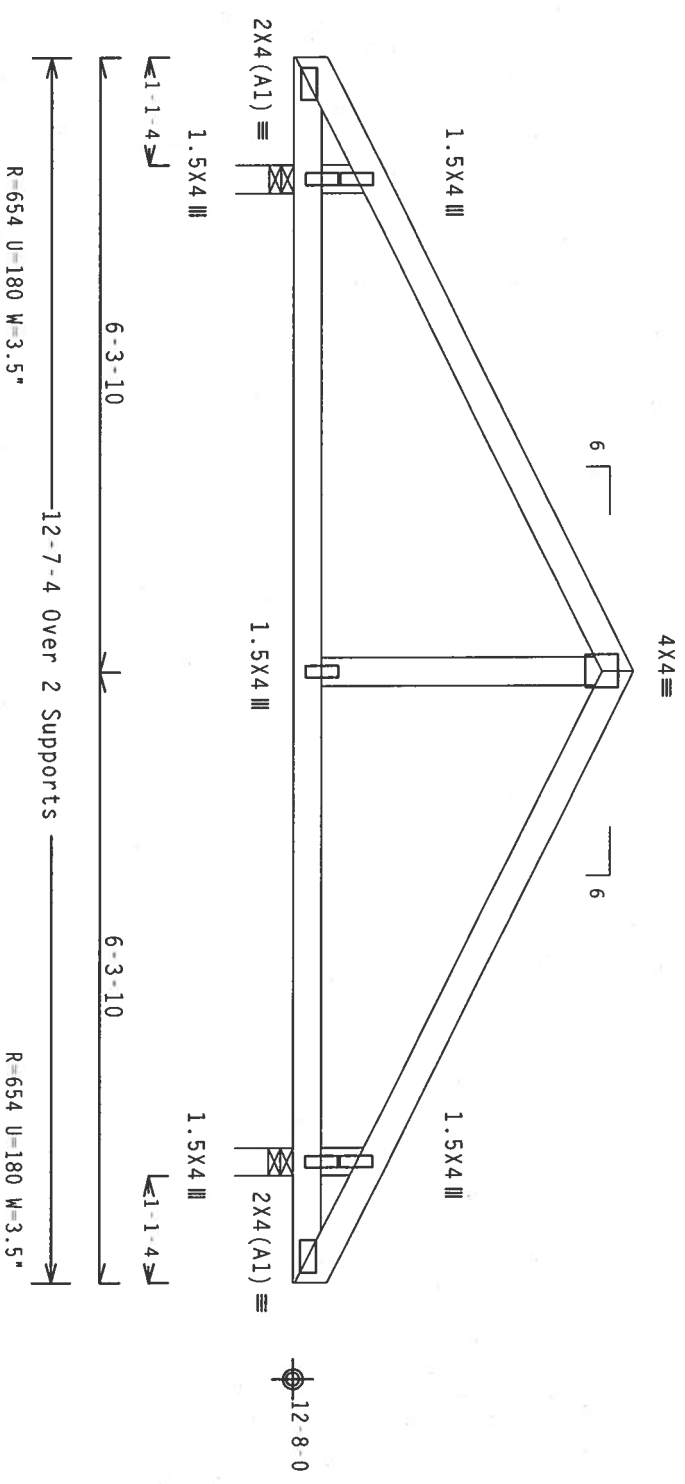
JRFF - 1SZ1487 Z01

Top chord 2x4 SP #2 Dense
Bot chord 2x4 SP #2 Dense
Webs 2x4 SP #3

In lieu of structural panels or rigid ceiling use purlins to brace TC @ 24" OC, BC @ 24" OC.

110 mph wind, 15.00 ft mean hgt, ASCE 7-02, CLOSED bldg, located anywhere in roof, CAT III OR IV, EXP B, wind TC DL=5.0 psf, wind BC DL=5.0 psf.

Deflection meets L/360 live and L/240 total load. Creep increase factor for dead load is 1.50.



PLT TYP. Wave

Design Crit: TPI-2002(STD)/FBC
Cq/RT=1.00(1.25)/10(0)

7.24.1230

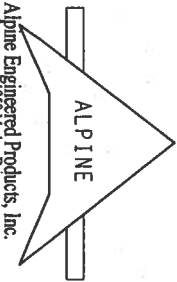
FL/-/7/-/1/-/R/-

Scale = .5"/ft.

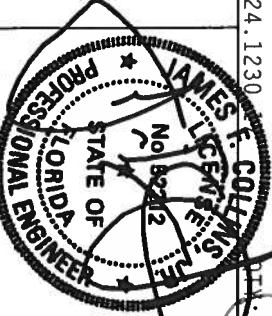
****WARNING**** TRUSSES REQUIRE EXTREME CARE IN FABRICATION, HANDLING, SHIPPING, INSTALLING AND BRACING. REFER TO BC31 1-03 (BUILDING COMPONENT SAFETY INFORMATION), PUBLISHED BY TPI (TRUSS PLATE INSTITUTE, 583 O'CONNOR DR., SUITE 200, FARMINGTON, VT 05475) AND WCA (WOOD TRUSS COUNCIL OF AMERICA, 6300 ENTERPRISE LN., SUITE 100, FARMINGTON, VT 05475) FOR ADDITIONAL INFORMATION. UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS SHALL HAVE PROPERLY ATTACHED STRUCTURAL PANELS AND BOTTOM CHORD SHALL HAVE A PROPERLY ATTACHED RIGID CEILING.

****IMPORTANT**** FURNISH A COPY OF THIS DESIGN TO THE INSTALLATION CONTRACTOR. ALPINE ENGINEERED PRODUCTS, INC. SHALL NOT BE RESPONSIBLE FOR ANY DEVIATION FROM THIS DESIGN. ANY FAILURE TO BUILD THE TRUSS IN CONFORMANCE WITH TPI OR FABRICATING, HANDLING, SHIPPING, INSTALLING AND BRACING OF TRUSSES, DESIGN CONFORMS WITH APPLICABLE PROVISIONS OF AIA (NATIONAL DESIGN SPEC. BY AFPA) AND TPI. ALPINE CONNECTOR PLATES ARE MADE OF 2018/1664 (W/H/S) ASTM A653 GRADE 40/60 (W/H/S) GALV. STEEL. APPLY PLATES TO EACH FACE OF TRUSS AND, UNLESS OTHERWISE LOCATED ON THIS DESIGN, POSITION PER DRAWINGS 160A-Z. ANY INSPECTION OF PLATES FOLLOWED BY (1) SHALL BE PER ANNEX A3 OF TPI-2002 SEC.3. A SEAL ON THIS DRAWING INDICATES ACCEPTANCE OF PROFESSIONAL ENGINEERING RESPONSIBILITY SOLELY FOR THE TRUSS COMPONENT DESIGN SHOWN. THE SUITABILITY AND USE OF THIS COMPONENT FOR ANY BUILDING IS THE RESPONSIBILITY OF THE BUILDING DESIGNER PER ANSI/TPI 1 SEC. 2.

ALPINE



Alpine Engineered Products, Inc.
1690 Main Drive
Haines City, FL 33844
Tel: 888-457-4571



TC LL	24.0 PSF	REF R487-- 25862
TC DL	16.0 PSF	DATE 07/19/06
BC DL	10.0 PSF	DRW HCUR487 06200014
BC LL	0.0 PSF	HC-ENG JB/AF
TOT. LD.	50.0 PSF	SEQN- 115827
DUR. FAC.	1.25	
SPACING	24.0"	

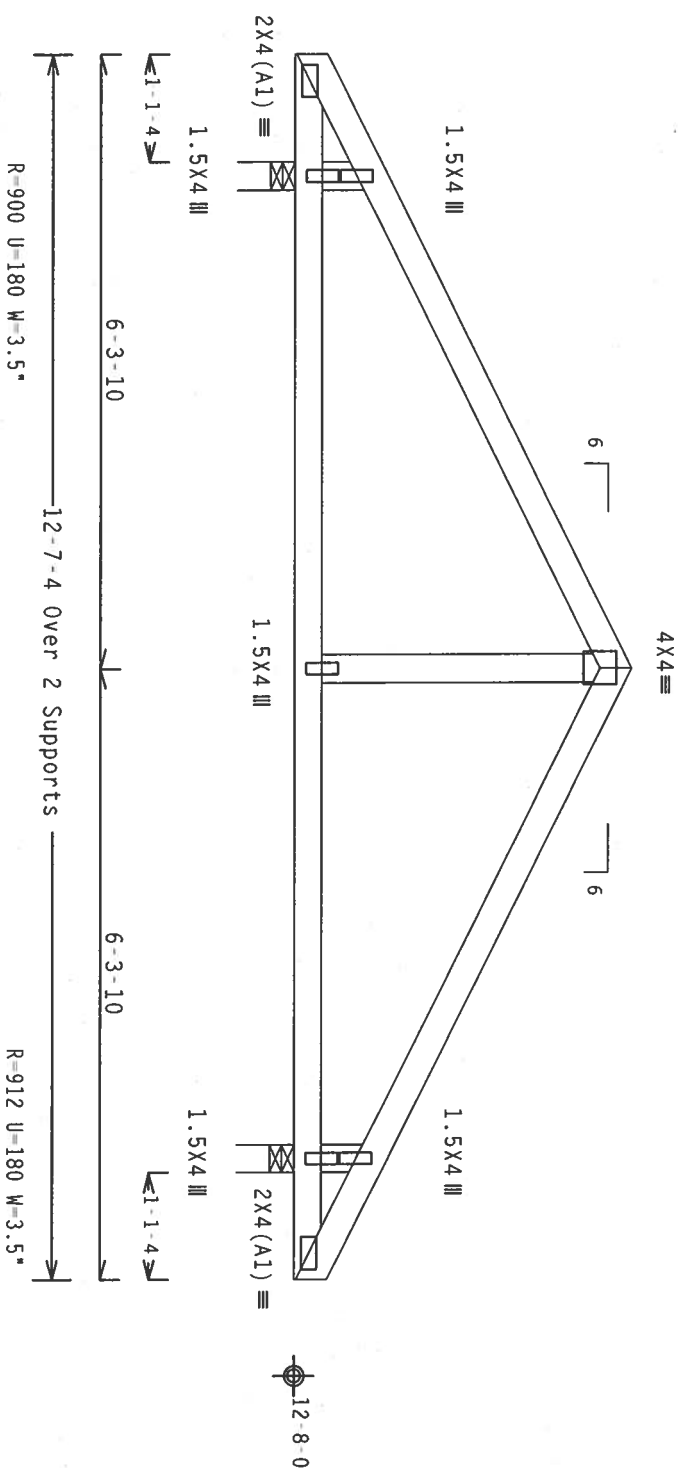
JRF-1SZ1487 201

110 mph wind, 15.00 ft mean hgt, ASCE 7-02, CLOSED bldg, located anywhere in roof, CAT III OR IV, EXP B, wind TC DL-5.0 psf, wind BC DL-5.0 psf.

In lieu of structural panels or rigid ceiling use purlins to

brace TC @ 24" OC, BC @ 24" OC.

Deflection meets L/360 live and L/240 total load. Creep increase factor for dead load is 1.50.



Scale = .5"/Ft.

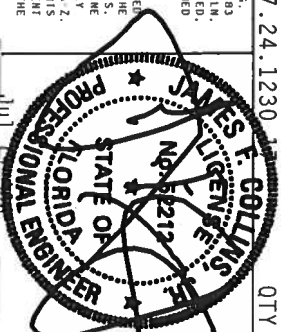
83
LM.
ED.
F. COLLINS
INTELLIGENCE
No. 5212

*****IMPORTANT*** FURNISH A COPY OF THIS DESIGN TO THE INSTALLATION CONTRACTOR**

ALPINE

Alpine Engineered Products, Inc.

Haimes City, FL 33844
Ficale of [REDACTED] on # 567



TC LL	24.0 PSF	REF	R487 - - 25863
TC DL	16.0 PSF	DATE	07/19/06
BC DL	10.0 PSF	DRW	HCSUR487 06200003
BC LL	0.0 PSF	HC-ENG	JB/AF
TOT.LD.	50.0 PSF	SEQN -	115857
DUR.FAC.	1.25		
SPACING	24.0"	JRFF -	1SZ1487 201

CLB WEB BRACE SUBSTITUTION

THIS DETAIL IS TO BE USED WHEN CONTINUOUS LATERAL BRACING (CLB) IS SPECIFIED ON AN ALPINE TRUSS DESIGN BUT AN ALTERNATIVE WEB BRACING METHOD IS DESIRED.

NOTES:

THIS DETAIL IS ONLY APPLICABLE FOR CHANGING THE SPECIFIED CLB SHOWN ON SINGLE PLY SEALED DESIGNS TO T-BRACING OR SCAB BRACING.
ALTERNATIVE BRACING SPECIFIED IN CHART BELOW MAY BE CONSERVATIVE. FOR MINIMUM ALTERNATIVE BRACING, RE-RUN DESIGN WITH APPROPRIATE BRACING.

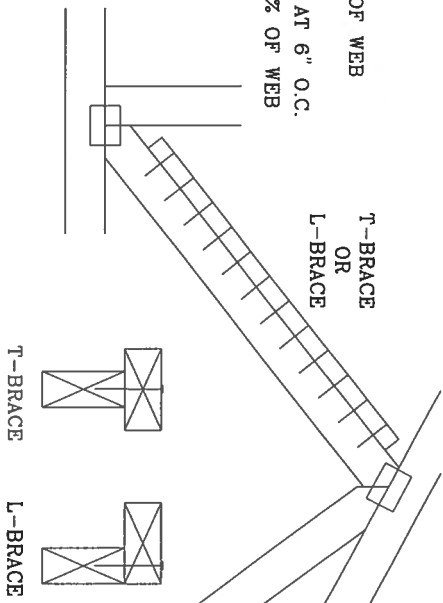
WEB MEMBER SIZE	SPECIFIED CLB BRACING	T OR L-BRACE	ALTERNATIVE BRACING SCAB BRACE
2X3 OR 2X4	1 ROW	2X4	1-2X4
2X3 OR 2X4	2 ROWS	2X6	2-2X4
2X6	1 ROW	2X4	1-2X6
2X6	2 ROWS	2X6	2-2X4(*)
2X8	1 ROW	2X6	1-2X8
2X8	2 ROWS	2X6	2-2X6(*)

T-BRACE, L-BRACE AND SCAB BRACE TO BE SAME SPECIES AND GRADE OR BETTER THAN WEB MEMBER UNLESS SPECIFIED OTHERWISE ON ENGINEER'S SEALED DESIGN.

(*) CENTER SCAB ON WIDE FACE OF WEB. APPLY (1) SCAB TO EACH FACE OF WEB.

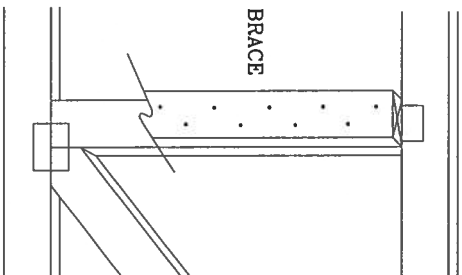
T-BRACING OR L-BRACING:

APPLY TO EITHER SIDE OF WEB NARROW FACE
ATTACH WITH 16d NAILS AT 6" O.C.
BRACE IS A MINIMUM 80% OF WEB MEMBER LENGTH



SCAB BRACING:

APPLY SCAB(S) TO WIDE FACE OF WEB. NO MORE THAN (1) SCAB PER FACE. ATTACH WITH 10d OR .128"x3" GUN NAILS AT 6" O.C. BRACE IS A MINIMUM 80% OF WEB MEMBER LENGTH



THIS DRAWING REPLACES DRAWING 579,640

ALPINE ENGINEERED PRODUCTS, INC.
POMPAHO BEACH, FLORIDA

WARNING TRUSSES REQUIRE EXTREME CARE IN FABRICATING, HANDLING, SHIPPING, INSTALLING AND BRACING. REFER TO BC31 1-03 BUILDING COMPONENT SAFETY INFORMATION, PUBLISHED BY TPI TRUSS PLATE INSTITUTE, 583 DOWNSIDE DR., SUITE 200, MADISON, WI 53719, AND VITA (VOID) TRUSS COUNCIL OF AMERICA, 6300 ENTERPRISE LN, MADISON, WI 53719 FOR SAFETY PRACTICES PRIOR TO PERFORMING TRUSS CONSTRUCTION. UNLESS OTHERWISE INDICATED, CHORD SHALL HAVE A PROPERLY ATTACHED STRUCTURAL PANELS AND BOTTOM CHORD SHALL HAVE A PROPERLY ATTACHED RIGID CEILING.

IMPORTANT FURNISH COPY OF THIS DESIGN TO INSTALLATION CONTRACTOR. ALPINE ENGINEERED PRODUCTS, INC. SHALL NOT BE RESPONSIBLE FOR ANY DEVIATION FROM THIS DESIGN, ANY FAILURE TO BUILD THE TRUSS IN CONFORMANCE WITH TPI, OR FABRICATING, HANDLING, SHIPPING, INSTALLING BRACING OF TRUSSES. DESIGN CONFORMS WITH APPLICABLE PROVISIONS OF NDS NATIONAL DESIGN SPEC. BY ASEA AND TPI. ALPINE CONNECTOR PLATES ARE MADE OF 20/18/16GA (V/H/S/X) ASTM A653 GRADE 40/60 (V/H/S) GALV. STEEL. APPLY PLATES TO EACH FACE OF TRUSS AND UNLESS OTHERWISE LOADED OR DESIGNED TO BE LOADED. ANY INSTALLATION OF PLATES FOLLOWED BY (1) SHALL BE THE DESIGNER'S RESPONSIBILITY. THE TRUSS DESIGNER SHALL BE RESPONSIBLE FOR THE DESIGN, THE PROFESSIONAL ENGINEERING RESPONSIBILITY SOLELY FOR THE TRUSS DESIGN SHOWING THE SUITABILITY AND USE OF THIS COMPONENT FOR ANY BUILDING IS THE RESPONSIBILITY OF THE BUILDING DESIGNER, PER ANSI/TPI 1 SEC. 2.

JAMES E. COLLINS, JR.
No. 62212
FLORIDA
PROFESSIONAL ENGINEER

TC LL

PSF

REF

CLB SUBST.

TC DL

PSF

DATE

11/26/03

BC DL

PSF

DRWG

BRCLBSUB1103

BC LL

PSF

-ENG

MLH/KAR

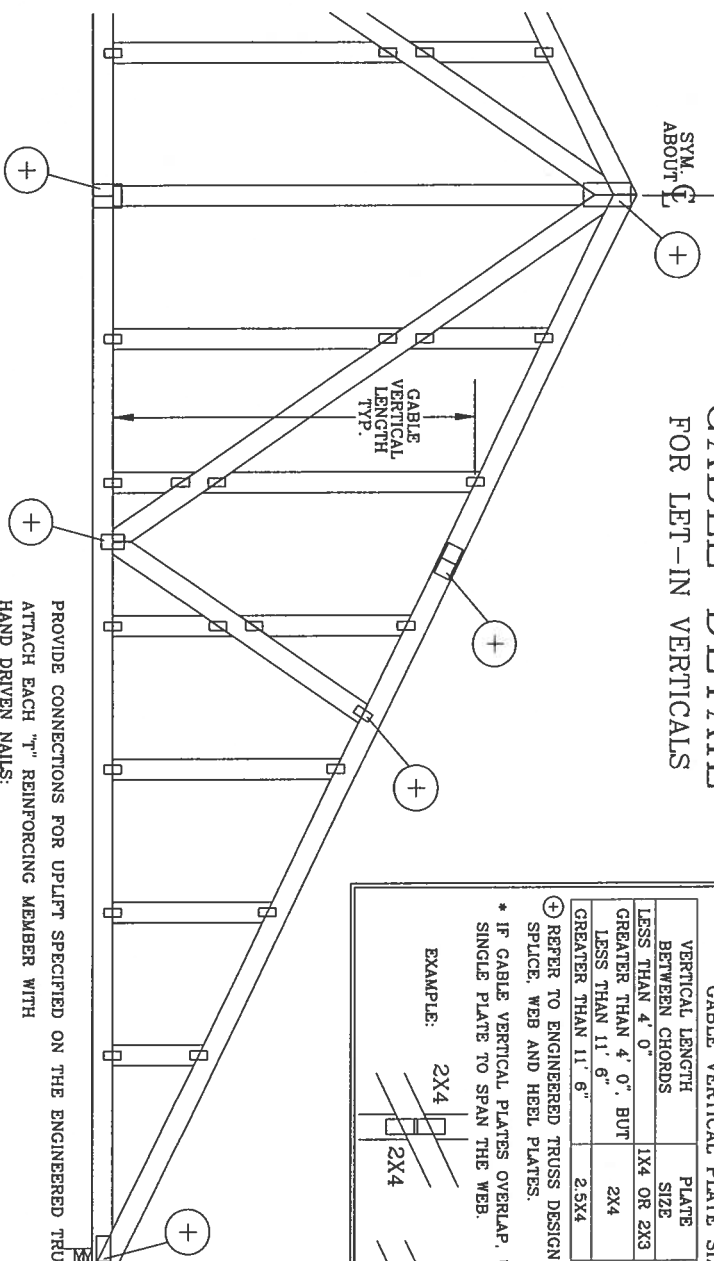
TOT. LD.

PSF

DUR. FAC.

SPACING

GABLE DETAIL FOR LET-IN VERTICALS

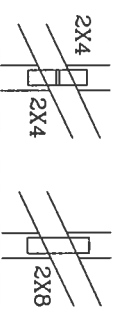


GABLE VERTICAL PLATE SIZES			
VERTICAL LENGTH BETWEEN CHORDS	PLATE SIZE	IF PLATES OVERLAP*	
LESS THAN 4' 0"	1X4 OR 2X3	2X8	
GREATER THAN 4' 0", BUT LESS THAN 11' 6"	2X4	2X8	
GREATER THAN 11' 6"	2.5X4	2.5X8	

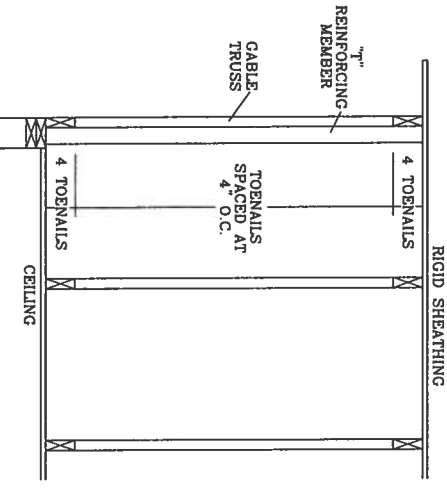
* REFER TO ENGINEERED TRUSS DESIGN FOR PEAK, SPLICE, WEB AND HEEL PLATES.

* IF GABLE VERTICAL PLATES OVERLAP, USE A SINGLE PLATE TO SPAN THE WEB.

EXAMPLE:



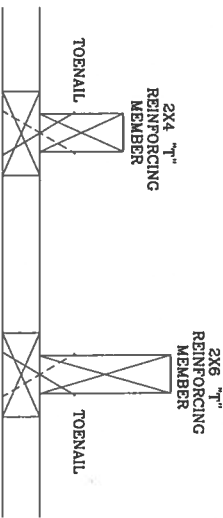
PROVIDE CONNECTIONS FOR UPLIFT SPECIFIED ON THE ENGINEERED TRUSS DESIGN.
 ATTACH EACH "T" REINFORCING MEMBER WITH
 HAND DRIVEN NAILS:
 10d COMMON (0.148" X 3" MIN) TOENAILS AT 4" O.C. PLUS
 (4) 16d COMMON (0.162" X 3.5" MIN) TOENAILS IN TOP AND BOTTOM CHORD.
 8d COMMON (0.131" X 2.5" MIN) TOENAILS AT 4" O.C. PLUS
 (4) TOENAILS IN TOP AND BOTTOM CHORD.



THIS DETAIL TO BE USED WITH THE APPROPRIATE ALPINE GABLE DETAIL FOR ASCE OR SBCCI WIND LOAD.
 ASCE 7-93 GABLE DETAIL DRAWINGS
 A11015EN1103, A10015EN1103, A09015EN1103, A08015EN1103, A07015EN1103
 A11030EN1103, A10030EN1103, A09030EN1103, A08030EN1103, A07030EN1103
 ASCE 7-98 GABLE DETAIL DRAWINGS
 A13015EC1103, A12015EC1103, A11015EC1103, A10015EC1103, A08515EC1103
 A13030EC1103, A12030EC1103, A11030EC1103, A10030EC1103, A08530EC1103
 ASCE 7-02 GABLE DETAIL DRAWINGS
 A13015ED0405, A12015ED0405, A11015ED0405, A10015ED0405, A08515ED0405
 A13030ED0405, A12030ED0405, A11030ED0405, A10030ED0405, A08530ED0405

SEE APPROPRIATE ALPINE GABLE DETAIL (ASCE OR SBCCI WIND LOAD) FOR MAXIMUM UNREINFORCED GABLE VERTICAL LENGTH.

TO CONVERT FROM "L" TO "T" REINFORCING MEMBERS, MULTIPLY "T" FACTOR BY LENGTH (BASED ON GABLE VERTICAL SPECIES, GRADE AND SPACING) FOR (1) 2X4 "L" BRACE, GROUP A, OBTAINED FROM THE APPROPRIATE ALPINE GABLE DETAIL FOR ASCE OR SBCCI WIND LOAD.



WIND SPEED AND MRR	"T" REINF. MBR. SIZE	SBCCI	ASCE
110 MPH	2x4	10 %	10 %
15 FT	2x6	40 %	50 %
110 MPH	2x4	10 %	10 %
30 FT	2x6	50 %	50 %
100 MPH	2x4	10 %	10 %
15 FT	2x6	30 %	50 %
100 MPH	2x4	10 %	10 %
30 FT	2x6	40 %	40 %
90 MPH	2x4	20 %	10 %
15 FT	2x6	10 %	10 %
80 MPH	2x4	10 %	10 %
15 FT	2x6	10 %	10 %
80 MPH	2x4	20 %	10 %
30 FT	2x6	20 %	10 %
70 MPH	2x4	0 %	20 %
15 FT	2x6	0 %	20 %
70 MPH	2x4	10 %	20 %
30 FT	2x6	10 %	30 %

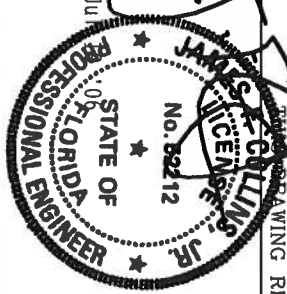
EXAMPLE:
 ASCE WIND SPEED = 100 MPH
 MEAN ROOF HEIGHT = 30 FT
 GABLE VERTICAL = 24" O.C. SP #3
 "T" REINFORCING MEMBER SIZE = 2X4
 "T" BRACE INCREASE (FROM ABOVE) = 10% = 1.10
 (1) 2X4 "L" BRACE LENGTH = 6' 7"
 MAXIMUM "T" REINFORCED GABLE VERTICAL LENGTH
 1.10 x 6' 7" = 7' 3"

DRAWING REPLACES DRAWINGS GAB98117 876,719 & HC26294035



ALPINE ENGINEERED PRODUCTS, INC.
 POMPANO BEACH, FLORIDA

WARNING TRUSSES REQUIRE EXTREME CARE IN FABRICATING, HANDLING, SHIPPING, INSTALLING AND BRACING. REFER TO BCSI 1-93 BUILDING COMPONENT SAFETY INFORMATION, PUBLISHED BY THE TRUSS PLATE INSTITUTE, 593 DUNDRIED DR., SUITE 200, MADISON, WI 53719, AND VITA CYCLO TRUSS COMPANY OF AMERICA, 6300 ENTERPRISE LN, MADISON, WI 53719, FOR SAFETY PRACTICES PRIOR TO PERFORMING THESE FUNCTIONS. UNLESS OTHERWISE INDICATED, TOP CHORD SHALL HAVE PROPERLY ATTACHED STRUCTURAL PANELS AND BOTTOM CHORD SHALL HAVE A PROPERLY ATTACHED RIGID CEILING.
 IMPORTANT FURNISH COPY OF THIS DESIGN TO INSTALLATION CONTRACTOR. ALPINE ENGINEERED PRODUCTS SHALL BE RESPONSIBLE FOR THE DESIGN, FABRICATING, HANDLING, SHIPPING AND INSTALLATION OF THE TRUSS IN CONFORMANCE WITH THE FABRICATING, HANDLING, SHIPPING AND INSTALLATION BRACING OF TRUSSES. DESIGN CONNECTOR PLATES ARE MADE OF 20/18/16GA (W/H/S/X) ASTM A653 GRADE 40/60 (V/K/H/S) GALV. STEEL. APPLY PLATES TO EACH FACE OF TRUSS AND, UNLESS OTHERWISE LOCATED ON THIS DESIGN, POSITION PER DRAWINGS 1600-2. ANY INSPECTION OF PLATES FOLLOWED BY (I) SHALL BE PER ANNEX A3 OF TPI 1-2002 SEC. 3. A SEAL ON THIS DRAWING INDICATES ACCEPTANCE OF THE PROFESSIONAL ENGINEERING RESPONSIBILITY FOR THE TRUSS COMPONENT DESIGN SHOWN. THE SUITABILITY AND USE OF THIS COMPONENT FOR ANY BUILDING IS THE RESPONSIBILITY OF THE BUILDING DESIGNER. PER ANSI/FP 1 SEC. 2.



MAX TOT. LD. 60 PSF	REF LET-IN VERT
DUR. FAC. ANY	DATE 04/14/05
MAX SPACING 24.0"	DRWG GBLLETTINO405
	-ENG DLJ/KAR

MAX GABLE VERTICAL LENGTH														
CABLE SPACING	2X4 VERTICAL SPECIES	BRACE GRADE	NO BRACES	(1) 1X4 "L" BRACE *		(1) 2X4 "L" BRACE *		(2) 2X4 "L" BRACE **		(1) 2X6 "L" BRACE *		(2) 2X6 "L" BRACE **		
				GROUP A	GROUP B	GROUP A	GROUP B	GROUP A	GROUP B	GROUP A	GROUP B	GROUP A	GROUP B	
24" O.C.	SPF	#1 / #2	3' 8"	6' 4"	6' 6"	7' 6"	7' 8"	8' 11"	9' 2"	11' 9"	12' 1"	14' 0"	14' 0"	
			#3	3' 7"	5' 5"	5' 5"	7' 2"	7' 2"	8' 11"	8' 11"	11' 2"	11' 2"	14' 0"	14' 0"
			STUD	3' 7"	5' 5"	5' 5"	7' 1"	7' 1"	8' 11"	8' 11"	11' 1"	11' 1"	14' 0"	14' 0"
	HF	STANDARD	3' 7"	4' 8"	4' 8"	6' 1"	6' 1"	8' 3"	8' 3"	9' 6"	9' 6"	12' 11"	12' 11"	
			#1	4' 0"	6' 4"	6' 10"	7' 6"	8' 1"	8' 11"	9' 7"	11' 9"	12' 8"	14' 0"	14' 0"
			#2	3' 11"	6' 4"	6' 10"	7' 6"	8' 1"	8' 11"	9' 7"	11' 9"	12' 8"	14' 0"	14' 0"
	SP	#3	3' 9"	5' 7"	5' 7"	7' 4"	7' 4"	8' 11"	9' 5"	11' 5"	11' 5"	14' 0"	14' 0"	
			STUD	3' 9"	5' 7"	5' 7"	7' 4"	7' 4"	8' 11"	9' 5"	11' 4"	11' 4"	14' 0"	14' 0"
			#1	3' 8"	4' 9"	4' 9"	6' 3"	6' 3"	8' 5"	8' 5"	9' 9"	9' 9"	13' 3"	13' 3"
	DFL	STANDARD	3' 9"	5' 6"	5' 6"	7' 3"	7' 3"	8' 11"	9' 5"	11' 5"	13' 5"	13' 10"	14' 0"	14' 0"
			#1 / #2	4' 2"	7' 3"	7' 5"	8' 7"	8' 10"	10' 3"	10' 6"	13' 5"	13' 10"	14' 0"	14' 0"
			#3	4' 1"	6' 8"	6' 8"	8' 7"	8' 7"	10' 3"	10' 3"	13' 5"	13' 5"	14' 0"	14' 0"
16" O.C.	SPF	STUD	4' 1"	8' 0"	8' 0"	8' 7"	8' 7"	10' 3"	10' 3"	13' 5"	13' 5"	14' 0"	14' 0"	
			HF	4' 1"	5' 8"	5' 8"	7' 6"	7' 6"	10' 1"	10' 1"	11' 8"	11' 8"	14' 0"	14' 0"
			#1	4' 7"	7' 3"	7' 9"	8' 7"	9' 3"	10' 3"	11' 0"	13' 5"	14' 0"	14' 0"	
	SP	#2	4' 6"	7' 3"	7' 9"	8' 7"	9' 3"	10' 3"	11' 0"	13' 5"	14' 0"	14' 0"		
			#3	4' 4"	6' 10"	6' 10"	8' 7"	9' 0"	10' 3"	10' 9"	13' 5"	14' 0"	14' 0"	
			STUD	4' 4"	6' 9"	6' 9"	8' 7"	8' 11"	10' 3"	10' 9"	13' 5"	14' 0"	14' 0"	
	DFL	STANDARD	4' 2"	5' 10"	5' 10"	7' 8"	7' 8"	10' 3"	10' 4"	11' 11"	11' 11"	14' 0"	14' 0"	
			#1 / #2	4' 7"	8' 0"	8' 2"	9' 5"	9' 8"	11' 3"	11' 7"	14' 0"	14' 0"	14' 0"	
			#3	4' 6"	7' 8"	7' 8"	9' 5"	9' 5"	11' 3"	11' 3"	14' 0"	14' 0"	14' 0"	
	12" O.C.	SPF	STUD	4' 6"	7' 8"	7' 8"	9' 5"	9' 5"	11' 3"	11' 3"	14' 0"	14' 0"	14' 0"	
				HF	4' 6"	7' 8"	7' 8"	9' 5"	9' 5"	11' 3"	11' 3"	14' 0"	14' 0"	14' 0"
				#1	4' 5"	6' 7"	6' 7"	8' 8"	8' 8"	11' 3"	12' 1"	14' 0"	14' 0"	14' 0"
SP		#2	4' 11"	8' 0"	8' 7"	9' 5"	10' 2"	11' 3"	12' 1"	14' 0"	14' 0"	14' 0"		
			#3	4' 9"	7' 11"	7' 11"	9' 5"	9' 11"	11' 3"	11' 10"	14' 0"	14' 0"	14' 0"	
			STUD	4' 9"	7' 9"	7' 9"	9' 5"	9' 11"	11' 3"	11' 10"	14' 0"	14' 0"	14' 0"	
DFL		STANDARD	4' 7"	6' 9"	6' 9"	8' 10"	8' 10"	11' 3"	11' 7"	13' 10"	13' 10"	14' 0"	14' 0"	

CABLE TRUSS DETAIL NOTES:

LIVE LOAD DEFLECTION CRITERIA IS $L/240$.

PROVIDE UPLIFT CONNECTIONS FOR 100 PLF OVER
CONTINUOUS BEARING (5 PSF TC DEAD LOAD).

GABLE END SUPPORTS LOAD FROM 4' 0"

PLYWOOD OVERHANG.

ATTACH EACH "L" BRACE WITH 10d NAILS.

* FOR (1) "L" BRACE: SPACE NAILS AT 2" O.C. IN 18" END ZONES AND 4" O.C. BETWEEN ZONES.

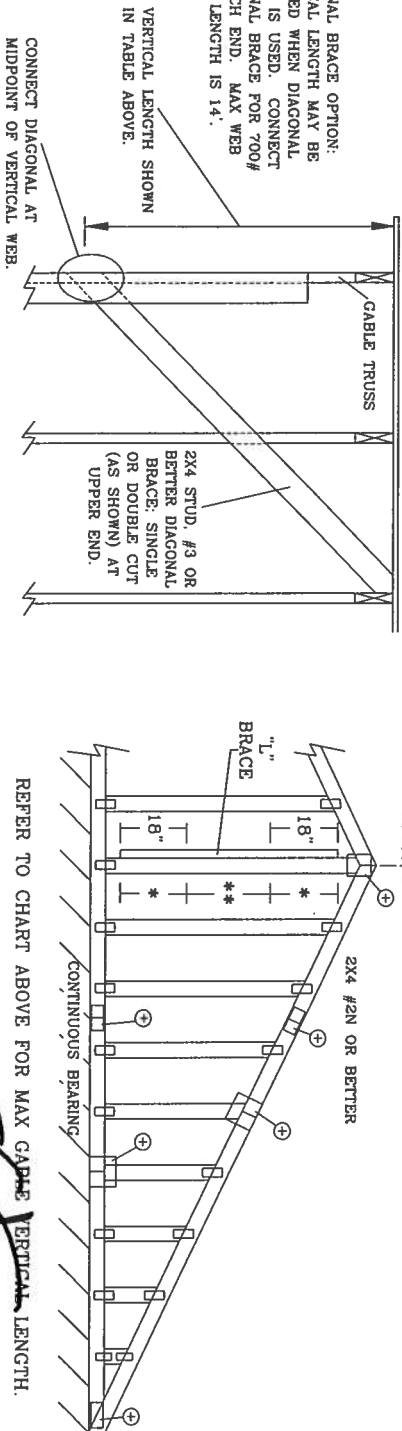
FOR (2) "L" BRACES: SPACE NAILS AT 3" O.C.
IN 18" END ZONES AND 6" O.C. BETWEEN ZONES.

** FOR (2) "L" BRACES: SPACE NAILS AT 3" O.C.
IN 18" END ZONES AND 6" O.C. BETWEEN ZONES.

"L" BRACING MUST BE A MINIMUM OF 80% OF WEB MEMBER LENGTH.

CABLE VERTICAL PLATE SIZES	
VERTICAL LENGTH	NO SPICE
LESS THAN 4' 0"	1X4 OR 2X3
GREATER THAN 4' 0" BUT LESS THAN 11' 6"	2X4
GREATER THAN 11' 6"	2.5X4

+ REFER TO COMMON TRUSS DESIGN FOR
PEAK, SPICE, AND HEEL PLATES.



DIAGONAL BRACE OPTION:
VERTICAL LENGTH MAY BE
DOUBLED WHEN DIAGONAL
BRACE IS USED. CONNECT
DIAGONAL BRACE FOR 700#
AT EACH END. MAX WEB
TOTAL LENGTH IS 14'.

VERTICAL LENGTH SHOWN
IN TABLE ABOVE.

CONNECT DIAGONAL AT
MIDPOINT OF VERTICAL WEB.

REFER TO CHART ABOVE FOR MAX CABLE ~~VERTICAL~~ LENGTH.

ALPINE

**ALPINE ENGINEERED PRODUCTS, INC.
POMPAN0 BEACH, FLORIDA**

WARRANTING: ISSUES REQUIRING EXTREME CARE IN FABRICATING, HANDLING, SHIPPING, INSTALLING, AND BRACING REFER TO BC01-1.03-BUILDING COMPONENT SAFETY INFORMATION, PUBLISHED BY TPI (TRUSS PLATE INSTITUTE, 963 DUNDORF RD., SUITE 200, MADISON, WI 53719) FOR SAFETY CROWD TRUSS CONNECTIONS OF AMERICA, 6200 ENTERPRISE LN, MADISON, WI 53719) FOR SAFETY PRACTICES PRIOR TO PERFORMING THE USE OF JOINTS. UNLESS OTHERWISE INDICATED, TOP CHORD SHALL HAVE PROPERLY ATTACHED STRUCTURAL PANELS AND BOTTOM CHORD SHALL HAVE A PROPERLY ATTACHED RIGID CELLO.

IMPORTANT: FURNISH COPY OF THIS DESIGN TO INSTALLATION CONTRACTOR. ALPINE ENGINEERED PRODUCTS, INC. SHALL NOT BE RESPONSIBLE FOR ANY DEVIATION FROM THIS DESIGN. ANY FAILURE TO BUILD THE TRUSS IN CONFORMANCE WITH TPI OR FABRICATING, HANDLING, SHIPPING, INSTALLING & BRACING OF TRUSSES DESIGN CONNECTORS WITH APPLICABLE PROVISIONS OF NDS NATIONAL DESIGN SPECIFICATION FOR WOOD CONSTRUCTION SHALL BE THE RESPONSIBILITY OF THE USER. ALPINE CONNECTOR PLATES ARE MADE OF 2080/16GA C/W/S/K ASTM A563 GRAD 50. ALL OTHERS SHALL BE IDENTICAL TO EACH OTHER. JOINTS AND UNLESS OTHERWISE LOCATED ON THIS DESIGN POSITION, THERE WILL BE NO JOINTS. SEE DRAWING FOR JOINT LOCATION. THERE SHALL BE PER ANNEX A3 OF TPI-1-2002 SEC. 3. A SEAL ON THIS DRAWING INDICATES ACCEPTANCE OF PROFESSIONAL ENGINEERING RESPONSIBILITY SOLELY FOR THE TRUSS COMPONENT DESIGN SHOWN. THE SUITABILITY AND USE OF THIS COMPONENT FOR ANY BUILDING IS THE RESPONSIBILITY OF THE BUILDING DESIGNER, PER ANSI/TPI 1 SEC. 2.

~~JAMES T. COLLINS
GENS
No. 52212
JR.~~

MAX. TOT. LD. 60 PSF

MAX. SPACING 24.0"

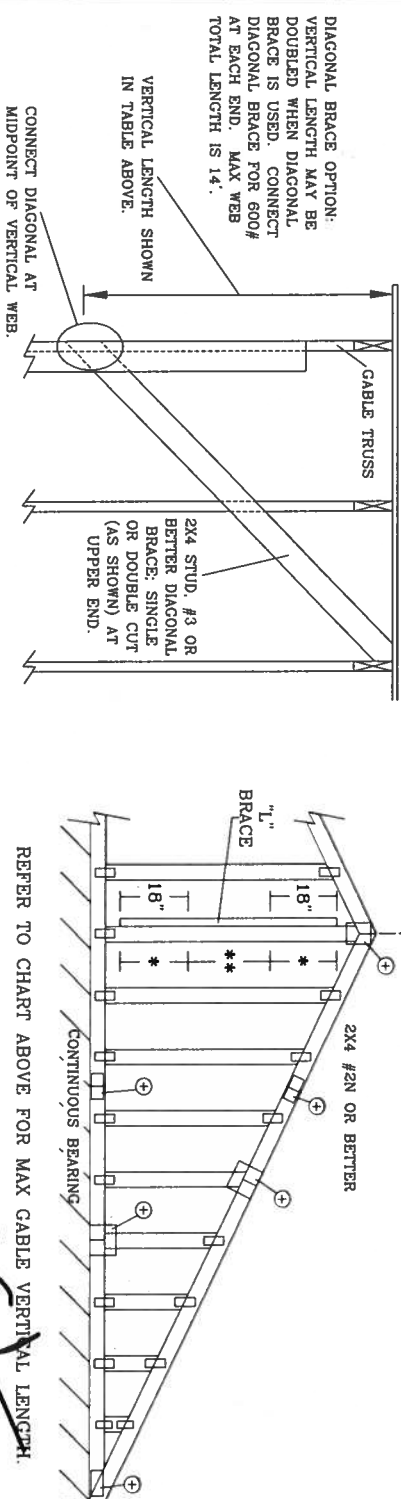
REF ASCE7-02-GAB11030

DATE 04/14/05

DRWG A11030EE0405

-ENG

MAX GABLE VERTICAL LENGTH																
CABLE VERTICAL SPACING SPECIES		BRACE GRADE	NO BRACES	(1) 1X4 "L" BRACE •		(1) 2X4 "L" BRACE •		(2) 2X4 "L" BRACE ••		(1) 2X6 "L" BRACE •		(2) 2X6 "L" BRACE •		(2) 2X6 "L" BRACE ••		
				GROUP A	GROUP B	GROUP A	GROUP B	GROUP A	GROUP B	GROUP A	GROUP B	GROUP A	GROUP B	GROUP A	GROUP B	
24" O.C.	SPF	#1 / #2	3' 10"	6' 8"	6' 10"	7' 11"	8' 1"	9' 5"	9' 8"	12' 5"	12' 9"	14' 0"	14' 0"	14' 0"	14' 0"	
		#3	3' 9"	6' 0"	6' 0"	7' 11"	7' 11"	9' 5"	9' 5"	12' 4"	12' 4"	14' 0"	14' 0"	14' 0"	14' 0"	
		STUD	3' 9"	6' 0"	6' 0"	7' 11"	7' 11"	9' 5"	9' 5"	12' 3"	12' 3"	14' 0"	14' 0"	14' 0"	14' 0"	
	HF	STANDARD	3' 9"	5' 2"	5' 2"	6' 9"	6' 9"	9' 1"	9' 1"	10' 7"	10' 7"	14' 0"	14' 0"	14' 0"	14' 0"	
		#1	4' 3"	6' 8"	7' 2"	7' 11"	8' 6"	9' 5"	10' 2"	12' 5"	13' 5"	14' 0"	14' 0"	14' 0"	14' 0"	
		#2	4' 2"	6' 8"	7' 2"	7' 11"	8' 6"	9' 5"	10' 2"	12' 5"	13' 5"	14' 0"	14' 0"	14' 0"	14' 0"	
	SP	#3	4' 0"	6' 2"	6' 2"	7' 11"	8' 1"	9' 5"	9' 11"	12' 5"	12' 8"	14' 0"	14' 0"	14' 0"	14' 0"	
		STUD	4' 0"	6' 1"	6' 1"	7' 11"	8' 0"	9' 5"	9' 11"	12' 5"	12' 6"	14' 0"	14' 0"	14' 0"	14' 0"	
		STANDARD	3' 10"	5' 3"	5' 3"	6' 11"	6' 11"	9' 4"	9' 4"	10' 10"	10' 10"	14' 0"	14' 0"	14' 0"	14' 0"	
	DFL	#1 / #2	4' 5"	7' 8"	7' 10"	9' 1"	9' 4"	10' 10"	11' 1"	14' 0"	14' 0"	14' 0"	14' 0"	14' 0"	14' 0"	
		#3	4' 4"	7' 4"	7' 4"	9' 1"	9' 1"	10' 10"	10' 10"	14' 0"	14' 0"	14' 0"	14' 0"	14' 0"	14' 0"	
		STUD	4' 4"	7' 4"	7' 4"	9' 1"	9' 1"	10' 10"	10' 10"	14' 0"	14' 0"	14' 0"	14' 0"	14' 0"	14' 0"	
16" O.C.	SPF	#1 / #2	4' 4"	6' 4"	6' 4"	8' 4"	8' 4"	10' 10"	10' 10"	12' 11"	12' 11"	14' 0"	14' 0"	14' 0"	14' 0"	
		#3	4' 4"	7' 4"	7' 4"	9' 1"	9' 1"	10' 10"	10' 10"	14' 0"	14' 0"	14' 0"	14' 0"	14' 0"	14' 0"	
		STUD	4' 4"	7' 4"	7' 4"	9' 1"	9' 1"	10' 10"	10' 10"	14' 0"	14' 0"	14' 0"	14' 0"	14' 0"	14' 0"	
	HF	STANDARD	4' 4"	6' 4"	6' 4"	8' 4"	8' 4"	10' 10"	10' 10"	12' 11"	12' 11"	14' 0"	14' 0"	14' 0"	14' 0"	
		#1	4' 10"	7' 8"	8' 3"	9' 1"	9' 9"	10' 10"	11' 8"	14' 0"	14' 0"	14' 0"	14' 0"	14' 0"	14' 0"	
		#2	4' 9"	7' 8"	8' 3"	9' 1"	9' 9"	10' 10"	11' 8"	14' 0"	14' 0"	14' 0"	14' 0"	14' 0"	14' 0"	
	SP	#3	4' 6"	7' 7"	7' 7"	9' 1"	9' 6"	10' 10"	11' 4"	14' 0"	14' 0"	14' 0"	14' 0"	14' 0"	14' 0"	
		STUD	4' 6"	7' 6"	7' 6"	9' 1"	9' 6"	10' 10"	11' 4"	14' 0"	14' 0"	14' 0"	14' 0"	14' 0"	14' 0"	
		STANDARD	4' 5"	6' 5"	6' 5"	8' 6"	8' 6"	10' 10"	11' 1"	13' 3"	13' 3"	14' 0"	14' 0"	14' 0"	14' 0"	
	DFL	#1 / #2	4' 11"	8' 5"	8' 5"	10' 0"	10' 3"	11' 11"	12' 3"	14' 0"	14' 0"	14' 0"	14' 0"	14' 0"	14' 0"	
		#3	4' 9"	8' 5"	8' 5"	10' 0"	10' 0"	11' 11"	11' 11"	14' 0"	14' 0"	14' 0"	14' 0"	14' 0"	14' 0"	
		STUD	4' 9"	8' 5"	8' 5"	10' 0"	10' 0"	11' 11"	11' 11"	14' 0"	14' 0"	14' 0"	14' 0"	14' 0"	14' 0"	
12" O.C.	SPF	STANDARD	4' 9"	7' 3"	7' 3"	9' 7"	9' 7"	11' 11"	12' 10"	14' 0"	14' 0"	14' 0"	14' 0"	14' 0"	14' 0"	
		#1	5' 4"	8' 5"	9' 1"	10' 0"	10' 9"	11' 11"	12' 10"	14' 0"	14' 0"	14' 0"	14' 0"	14' 0"	14' 0"	
		#2	5' 3"	8' 5"	9' 1"	10' 0"	10' 9"	11' 11"	12' 10"	14' 0"	14' 0"	14' 0"	14' 0"	14' 0"	14' 0"	
	SP	#3	5' 0"	8' 5"	8' 5"	10' 0"	10' 6"	11' 11"	12' 6"	14' 0"	14' 0"	14' 0"	14' 0"	14' 0"	14' 0"	
		STUD	5' 0"	8' 5"	8' 5"	10' 0"	10' 6"	11' 11"	12' 6"	14' 0"	14' 0"	14' 0"	14' 0"	14' 0"	14' 0"	
		STANDARD	4' 11"	7' 5"	7' 5"	9' 10"	9' 10"	11' 11"	12' 3"	14' 0"	14' 0"	14' 0"	14' 0"	14' 0"	14' 0"	



REFER TO CHART ABOVE FOR MAX CABLE VERTICAL LENGTH.

GABLE VERTICAL PLATE SIZES	
VERTICAL LENGTH	NO SPLICE
LESS THAN 4' 0"	1X4 OR 2X3
GREATER THAN 4' 0" BUT LESS THAN 11' 6"	2X4
GREATER THAN 11' 6"	2.5X4

+ REFER TO COMMON TRUSS DESIGN FOR PEAK, SPLICE, AND HEEL PLATES.

ATTACH EACH "L" BRACE WITH 10d NAILS.
 * FOR (1) "L" BRACE: SPACE NAILS AT 2' O.C. IN 18" END ZONES AND 4' O.C. BETWEEN ZONES.
 ** FOR (2) "L" BRACES: SPACE NAILS AT 3' O.C. IN 18" END ZONES AND 6' O.C. BETWEEN ZONES.
 "L" BRACING MUST BE A MINIMUM OF 80% OF WEB MEMBER LENGTH.

GABLE TRUSS DETAIL NOTES:

LIVE LOAD DEFLECTION CRITERIA IS L/240.

PROVIDE UPLIFT CONNECTIONS FOR 80 PLF OVER CONTINUOUS BEARING (5 PSF TC DEAD LOAD).

GABLE END SUPPORTS LOAD FROM 4' 0" OUTLOOKERS WITH 2' 0" OVERHANG, OR 12" PLYWOOD OVERHANG.

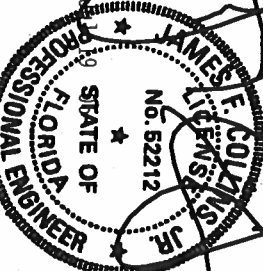
BRACING GROUP SPECIES AND GRADES:	
GROUP A:	
SPRUCE-PINE-FIR	HEM-FIR
#1 / #2	#2
STUD	STUD
#3	#3
STUD	STUD
STANDARD	STANDARD
GROUP B:	
DOUGLAS FIR-LARCH	DOUGLAS FIR-LARCH
#1 & BTR	#1
#1	#2
#2	#2



ALPINE ENGINEERED PRODUCTS, INC.
POMPAHO BEACH, FLORIDA

WARNING TRUSSES REQUIRE EXTREME CARE IN FABRICATING, HANDLING, SHIPPING, INSTALLING AND BRACING. REFER TO DESIGNING BUILDING COMPONENT SAFETY IN OPERATION, PUBLISHED BY THE TRUSS ASSOCIATION OF AMERICA, 6300 ENTERPRISE BLVD., MADISON, WI 53719 FOR SAFETY PRACTICES PRIOR TO PERFORMING THESE FUNCTIONS. UNLESS OTHERWISE INDICATED, TOP CHORD SHALL HAVE PROPERLY ATTACHED STRUCTURAL PANELS AND BOTTOM CHORD SHALL HAVE A PROPERLY ATTACHED RIGID CEILING.

IMPORTANT FURNISH COPY OF THIS DESIGN TO INSTALLATION CONTRACTOR. ALPINE ENGINEERED PRODUCTS, INC. SHALL NOT BE RESPONSIBLE FOR ANY DEVIATION FROM THIS DESIGN, ANY FAILURE TO BUILD THE TRUSSES IN CONFORMANCE WITH TPI OR FABRICATING, HANDLING, SHIPPING, INSTALLING & BRACING THE TRUSSES. THE TRUSSES ARE DESIGNED FOR 150 PSF DEAD LOAD AND 40 PSF LIVE LOAD. BY APPLICABLE CODES, ALPINE ENGINEERED PRODUCTS, INC. SHALL BE RESPONSIBLE FOR THE DESIGN OF 40/60 CY/K/HS GALV. STEEL, APPLY PLATES TO EACH FACE OF TRUSS AND UNLESS OTHERWISE LOCATED ON THIS DESIGN, POSITION PER DRAWINGS 160A-2. ANY INSPECTION OF PLATES FOLLOWED BY CD SHALL BE PER ANNEX A3 OF TPI 1-2002 SEC. 3. A SEAL ON THIS DRAWING INDICATES ACCEPTANCE OF THE PROFESSIONAL ENGINEERING RESPONSIBILITY SOLELY FOR THE TRUSS COMPONENT DESIGN SHOWN. THE SUITABILITY AND USE OF THIS COMPONENT FOR ANY BUILDING IS THE RESPONSIBILITY OF THE BUILDING DESIGNER, PER ANSI/TPI 1 SEC. 2.



REF	ASCE7-02-CAB11015
DATE	04/15/05
DRWG	A11015EE0405
-ENG	
MAX. TOT. LD.	60 PSF
MAX. SPACING	24.0"

PEOPLES STATE BANK

WEST OFFICE

NEW BRANCH BANK

LAKE CITY, FLORIDA



ARCHITECTURE
INTERIOR DESIGN
SPACE PLANNING

PROJECT MANUAL

FOR

PEOPLES STATE BANK

WEST OFFICE

NEW BRANCH BANK

FOR

PEOPLES STATE BANK
350 SW MAIN BOULEVARD
LAKE CITY, FLORIDA 32056-2199

DSI DESIGN SERVICES INCORPORATED
1778 N. PARK AVE., SUITE 100
MAITLAND, FLORIDA 32751
(407) 629-5755

DSI PROJECT NO. 06003.00

DATE: 2/15/06

TABLE OF CONTENTS

BIDDING REQUIREMENTS

SECTION 00010	INVITATION TO BID
SECTION 00030	BID FORM
SECTION 00100	INSTRUCTION TO BIDDERS
SECTION 00150	PRODUCTION SUBSTITUTION FORM

CONTRACT REQUIREMENTS

SECTION 00700	GENERAL CONDITIONS
SECTION 00810	SUPPLEMENTARY GENERAL CONDITIONS
SECTION 00910	SPECIAL CONDITIONS

DIVISION 01 GENERAL REQUIREMENTS

SECTION 01010	SUMMARY OF WORK
SECTION 01050	FIELD ENGINEERING
SECTION 01080	PROJECT SIGN
SECTION 01200	PROJECT MEETINGS
SECTION 01300	SUBMITTALS
SECTION 01310	SCHEDULES, LOGS, PAYMENTS
SECTION 01400	QUALITY CONTROL
SECTION 01402	STEEL QUALITY CONTROL
SECTION 01500	CONSTRUCTION FACILITIES & TEMP. CONTROLS
SECTION 01700	CONTRACT CLOSE-OUT
SECTION 01743	ROOF WARRANTY

DIVISION 02 SITE WORK

SECTION 02010	SUBSURFACE INVESTIGATION AND EXPLORATION
SECTION 02100	SITE PREPARATION
SECTION 02200	EARTHWORK
SECTION 02281	TERMITE CONTROL

DIVISION 03 CONCRETE

SECTION 03300	CAST-IN-PLACE CONCRETE
SECTION 03540	POLYMER GLASS FIBER REINFORCED CEMENT (GRC)
SECTION 03600	GROUT

DIVISION 04 MASONRY

SECTION 04100	MORTAR
SECTION 04200	UNIT MASONRY

DIVISION 05 METALS

SECTION 05120	STRUCTURAL STEEL
SECTION 05400	LIGHT GAUGE METAL FRAMING
SECTION 05500	METAL FABRICATIONS

DIVISION 06 WOOD AND PLASTICS

SECTION 06100	ROUGH CARPENTRY
SECTION 06190	PRE-FABRICATED WOOD TRUSSES
SECTION 06200	FINISH CARPENTRY
SECTION 06401	PRE-FINISHED FOAM TRIMS
SECTION 06410	CABINET WORK
SECTION 06600	PLASTIC FABRICATIONS
SECTION 06610	GLASS FIBER & RESIN FABRICATIONS

DIVISION 07 THERMAL AND MOISTURE PROTECTION

SECTION 07160	BITUMINOUS DAMPPROOFING
SECTION 07190	WATER REPELLENT COATINGS
SECTION 07200	BUILDING INSULATION
SECTION 07280	AIR BARRIER
SECTION 07311	FIBERGLASS-BASED ASPHALT SHINGLES
SECTION 07464	VINYL SOFFIT
SECTION 07600	FLASHING AND SHEET METAL
SECTION 07651	THROUGH-WALL FLASHING
SECTION 07840	FIRESTOPPING
SECTION 07900	SEALANTS

DIVISION 08 DOORS AND WINDOWS

SECTION 08100	METAL DOOR FRAMES
SECTION 08200	FIRE RATED WOOD DOOR FRAMES
SECTION 08210	WOOD DOORS
SECTION 08305	ACCESS DOORS
SECTION 08400	ENTRANCES AND STOREFRONTS
SECTION 08520	ALUMINUM WINDOWS
SECTION 08584	VINYLS SHUTTERS
SECTION 08710	FINISH HARDWARE
SECTION 08800	GLASS AND GLAZING

DIVISION 09 FINISHES

SECTION 09260	GYPSUM WALLBOARD SYSTEMS
SECTION 09331	CERAMIC FLOOR TILE
SECTION 09510	ACOUSTICAL CEILINGS
SECTION 09650	RESILIENT FLOORING
SECTION 09680	CARPETING
SECTION 09900	PAINTING
SECTION 09950	VINYL WALLCOVERING

DIVISION 10 SPECIALITIES

SECTION 10400	IDENTIFYING DEVICES
SECTION 10522	FIRE EXTINGUISHERS, CABINETS & ACCESSORIES
SECTION 10670	STORAGE SHELVING
SECTION 10800	TOILET AND BATH ACCESSORIES

DIVISION 11 EQUIPMENT

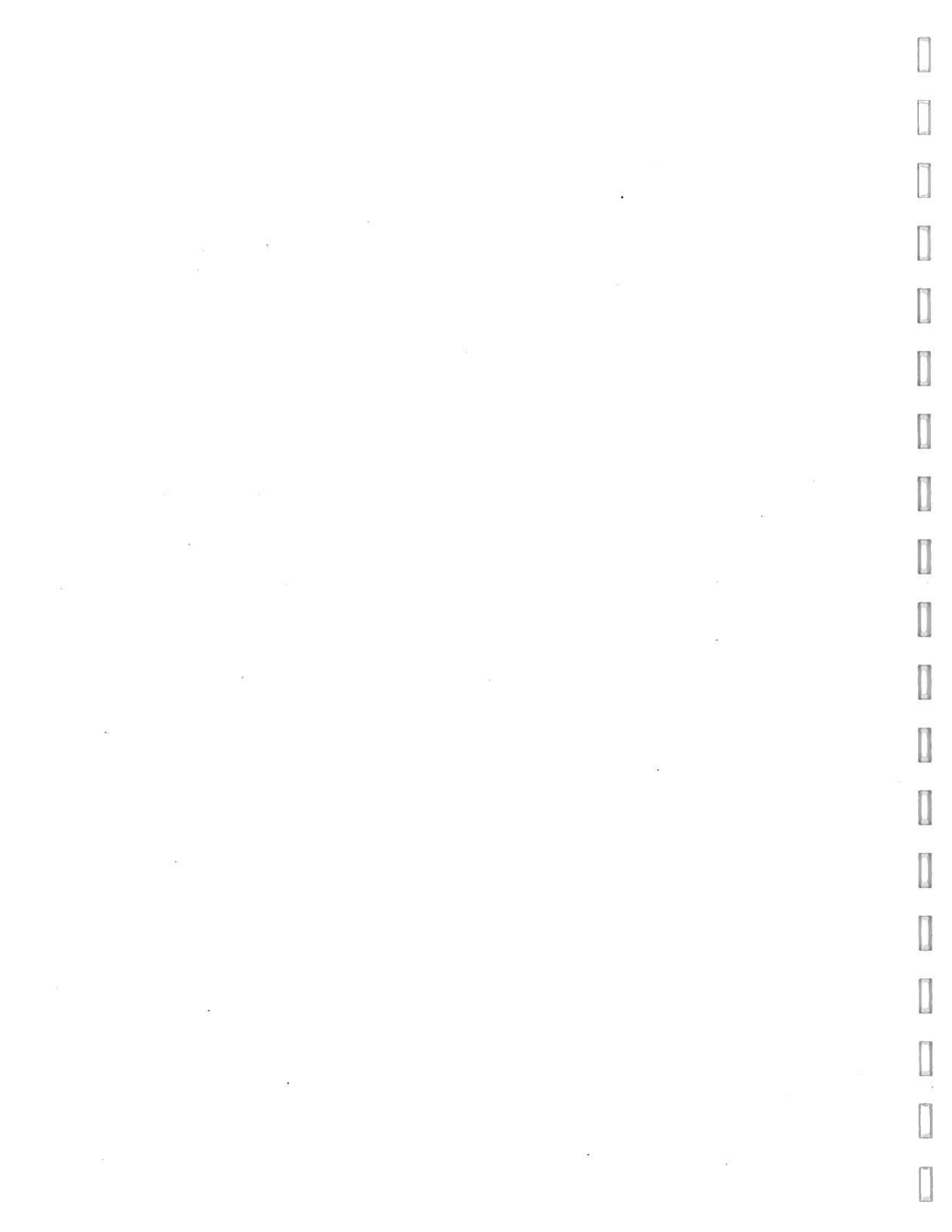
SECTION 11030	TELLER AND SERVICE EQUIPMENT
SECTION 11100	BANK AND VAULT EQUIPMENT
SECTION 11452	APPLIANCES

DIVISION 12	FURNISHINGS	
	SECTION 12501	HORIZONTAL LOUVER BLINDS
DIVISION 13	SPECIAL CONSTRUCTION	
	Not Applicable	
DIVISION 14	CONVEYING SYSTEMS	
	Not Applicable	
DIVISION 15	MECHANICAL	
	SECTION 15010	GENERAL MECHANICAL PROVISIONS
	SECTION 15050	BASIC MECHANICAL MATERIALS & METHODS
	SECTION 15062	REFRIGERATION, PIPING, VALVES & SPECIALTIES
	SECTION 15151	HANGERS & SUPPORTS
	SECTION 15201	VIBRATION ISOLATION EQUIPMENT
	SECTION 15400	PLUMBING
	SECTION 15401	SANITARY SEWER, STORM WATER & SANITARY VENT PIPING
	SECTION 15402	DOMESTIC COLD & HOT WATER SUPPLY PIPING
	SECTION 15421	FLOOR DRAINS
	SECTION 15423	CLEAN-OUTS & CLEAN-OUT ACCESS COVERS
	SECTION 15450	PLUMBING FIXTURES AND TRIM
	SECTION 15460	VALVES, COCKS, & SPECIALTIES FOR PLUMBING SYSTEMS
	SECTION 15465	INSULATION FOR PLUMBING SYSTEMS
	SECTION 15672	AIR COOLED CONDENSING UNITS, SEMI-HERMETIC
	SECTION 15852	AIR HANDLING UNITS, SPLIT SYSTEMS
	SECTION 15866	FANS: CENTRIFUGAL, CEILING MOUNTED
	SECTION 15890	DUCTWORK
	SECTION 15897	FILTER ACCESSORIES
	SECTION 15910	AIR DISTRIBUTION
	SECTION 15981	PERFORMANCE VERIFICATION
DIVISION 16	ELECTRICAL	
	SECTION 16010	BASIC ELECTRICAL REQUIREMENTS
	SECTION 16100	BASIC MATERIALS AND METHODS
	SECTION 16060	GROUNDING AND BONDING
	SECTION 16073	HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS
	SECTION 16211	ELECTICAL METERING
	SECTION 16511	INTERIOR LIGHTING
	SECTION 16740	TELEPHONE, DATA AND SECURITY SYSTEMS CONDUIT SYSTEMS



DIVISION 0 - BIDDING AND CONTRACT REQUIREMENTS

SECTION	00010	INVITATION TO BID	1 THRU 1
SECTION	00030	BID FORM	1 THRU 3
SECTION	00100	INSTRUCTION TO BIDDERS	1 THRU 6
SECTION	00150	PRODUCTION SUBSTITUTION FORM	1 THRU 3
SECTION	00700	GENERAL CONDITIONS	1 THRU 1
SECTION	00810	SUPPLEMENTARY GENERAL CONDITIONS	1 THRU 5
SECTION	00910	SPECIAL CONDITIONS	1 THRU 6



SECTION 00010

INVITATION TO BID

FOR: PEOPLES STATE BANK
WEST OFFICE
NEW BRANCH BANK
LAKE CITY, FLORIDA

CLOSED BID OPENING

The Owner will accept sealed proposals until 11:30 AM local time, on 22ND day of June 2006.
Delivery one copy of Bid to the following location:

To the Office of: GILL MILLER
PEOPLES STATE BANK
350 SW MAIN BOULEVARD
LAKE CITY, FLORIDA 32056-2199

FAXED COPIES OF BIDS WILL NOT BE ACCEPTED.

Indicate on outside of envelope the project name and location.

Opening of Bids will be held in private. The successful Bidder will be notified after the Bids have been reviewed.

All materials furnished and all Work performed shall be in accordance with the Drawings, Specifications and Addendum pertaining thereto.

A lump sum Bid is required for the complete Work. The drawings with specifications are issued by DSI Design Services Incorporated.

Prime Bidders will receive three (3) complimentary sets of Bid and Contract Documents. Additional sets may be purchased from DSI Design Services Incorporated (407) 629-5755 (at the cost of reproduction). Note: The method and cost of shipping additional sets are the responsibility of the Bidder.

The Owner reserves the right to waive any informalities in or to reject any or all bids. Bids from any person, firm or corporation in default upon any agreement with the Owner will be rejected.

The Contractor, in order to be eligible for the Contract, must be able to show his financial ability to carry on the work until such time as he has received the first payment of the Contract, and to finance the work between payments until the Contract is completed and accepted.

All bids must be submitted on the bid form as furnished by the Architect and must be accompanied by a certificate of Workman's compensation, insurance, Certificate of liability insurance, list of Sub-Contractors and Schedule of Values, Performance and Payment Bond Letter, Bid Bond (if applicable) and/or any other items specifically requested on the Bid Form and at the time indicated.

The bid shall remain in force for sixty days (60) after the time of opening.

END OF SECTION

SECTION 00030

BID FORM

TO: GILL MILLER
PEOPLES STATE BANK
350 SW MAIN BOULEVARD
LAKE CITY, FLORIDA 32056-2199

DUE DATE: 22 JUNE 2006
TIME DUE: 11:30 AM

FROM:

RE: PEOPLES STATE BANK
WEST OFFICE
LAKE CITY, FLORIDA

Gentlemen:

1. Having carefully examined the Bidding Documents for the referenced work prepared by DSI Design Services Incorporated, dated _____, and Addenda (um) Nos. _____ through _____, receipt of which is hereby acknowledged: The Undersigned proposes to furnish all labor, material and equipment required for the completion of the entire work in accord with said documents for the sum of:

_____ Dollars (\$ _____) which sum is referred to as the "Base Bid".

2. The Bidder proposes that should any of the following Alternates as further clarified in Section 01100, Alternates and Allowances, be accepted and be incorporated into the Contract, the Base Bid will be altered in each case as follows:

A. ALTERNATES

1. NOT APPLICABLE

3. The Bidder shall include all of the following Allowances as further clarified in Section 01100 Alternates and Allowances, be incorporated into the Contract as part of the Base Bid.

A. ALLOWANCES

1. NOT APPLICABLE

4. Bidder agrees not to revoke or withdraw this Bid for 60 days following opening of Bids. In case he is notified in writing by mail, telegraph or delivery of the acceptance of this Bid within this time, he agrees to execute a Contract on the prescribed form and based on this Bid within ten days of the notification, and at the same time to furnish Performance and Labor and Material Payment Bond in the amounts specified.
5. Bidder agrees to commence actual physical Work on the site with an adequate force and equipment within ten days of a date to be specified in a written order from the Owner, known as a Notice Proceed and/or the Notice of Commencement and the issuance of the Building Permit and to prosecute the Work faithfully with adequate materials and labor and to complete same within consecutive calendar days (to be determined by Contractor) from and including said date.
6. Bidder is aware of and is agreeable to the Liquidated Damages specified in the Instructions to Bidders Section 00100.
7. REQUIRED ATTACHMENTS (If required - See Instruction to Bidders Section 00100)
- A. Certificate of Workman's Compensation Insurance _____Attached
 - B. Certificate of Liability Insurance _____Attached
 - C. Performance/Labor & Materials Payment Bond Letter _____Attached
 - D. List of Subcontractors (included in Base Bid) within 24 hours of bid date and time
 - E. Schedule of Values within 24 hours of bid date and time

FAILURE TO PROVIDE THE ABOVE ATTACHMENTS MAY RESULT IN DISQUALIFICATION OF THE BIDDER

8. Provide the following information related to the "INDIVIDUAL" who will obtain the building permit for the General Contractor.
- A. Name _____(printed)
 - B. Is the "INDIVIDUAL" a _____"Certified Contractor or _____Registered Contractor
 - C. State License No. _____ County/City License No. _____
 - D. Is the "INDIVIDUAL" a state registered "qualified agent" of the General Contractor?
_____Yes_____NO

FAILURE TO PROVIDE THE ABOVE INFORMATION MAY RESULT IN DISQUALIFICATION OF THE BIDDER. THIS INFORMATION WILL BE INCORPORATED INTO THE "OWNER/CONTRACTOR" AGREEMENT AND NO DEVIATION WILL BE ALLOWED PRIOR TO OR AFTER EXECUTION OF THE CONTRACT.

9. The undersigned acknowledges and affirms that all subcontractors from whom bids have been received and incorporated into the Base Bid have been provided with copies of all Addenda, clarifications or other pertinent bid documents.

10. Respectfully Submitted,

Name of Bidder _____

Address: _____

By: _____

Title: _____

Witnessed by: _____

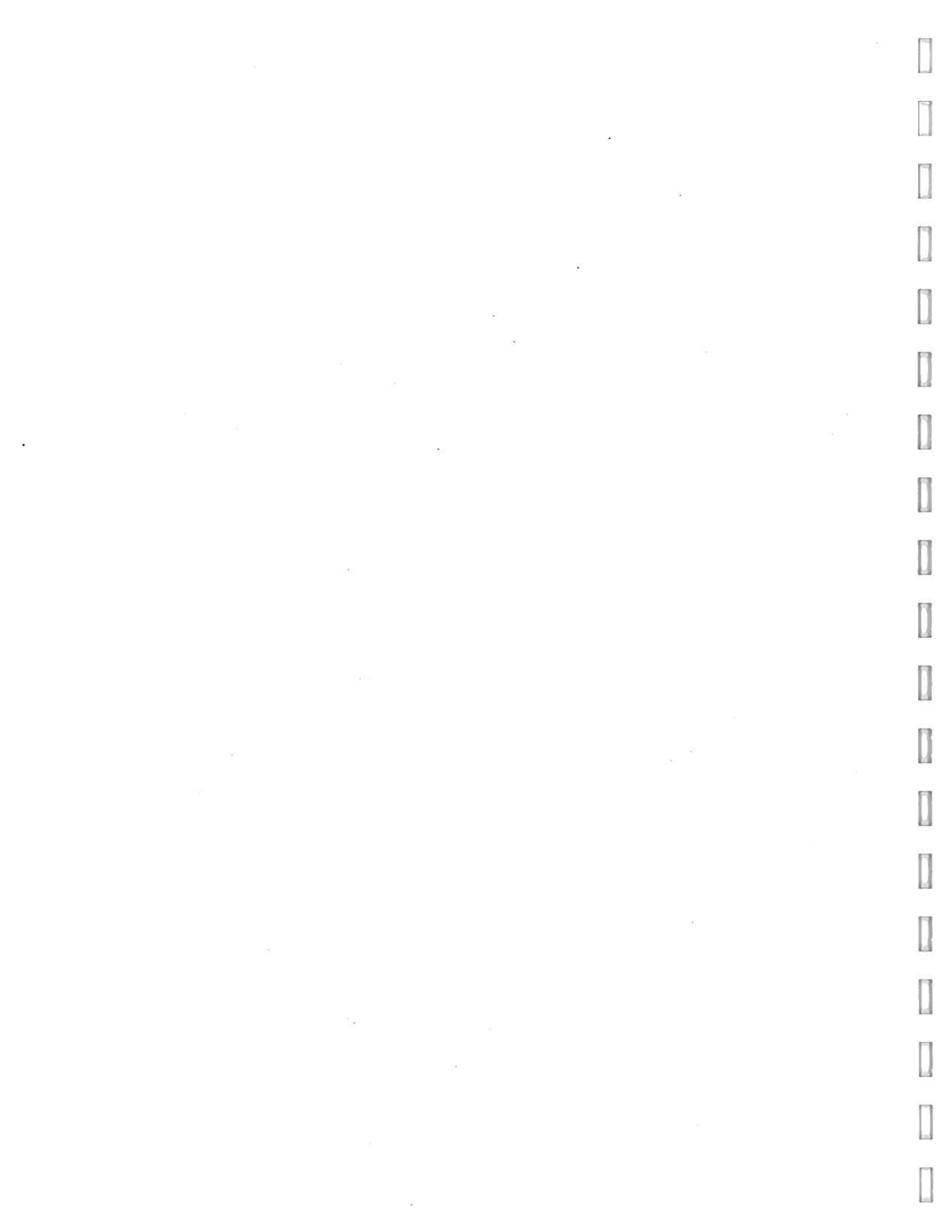
and _____

Date: _____

Date: _____

Contractor's License Number for the State of Florida _____

END OF DOCUMENT



SECTION 00100

INSTRUCTIONS TO BIDDERS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. The work to be done consists of furnishing materials, labor, equipment, tool and all incidentals required to construct in conformity with these specifications and the drawings.

1.02 DEFINITIONS

A. TERMS

1. Bidding Documents: Consists of Bidding Requirements and proposed Contract Documents.
2. Bidding Requirements: Consists of Invitation to Bid, Instructions to Bidders, Supplementary Instructions to Bidders, Bid Form.
3. Proposed Contract Documents: Consists of Form of Agreement Between Owner and General Contractor, Conditions of the Contract, Drawings, Specifications and all Addenda issued prior to execution of the Contract.
4. Addenda: Written or graphic documents issued by Architect prior to execution Agreement adding, deleting, clarifying or correcting Bidding Documents.
5. Bid: Complete and properly signed proposal to perform Work in accord with Bid Documents for sums stipulated. Accompany Bid by required additional data to be submitted with Bid.
6. Base Bid: Sum stated in Bid Form which Bidder proposes to complete Work describe without consideration for proposed added or deleted Work by Alternates or unit prices.
7. Alternate: Amount stated in Bid Form to be added to or deducted from Base Bid amount, bought about by change in scope of Work. Alternates describe Alternates section.
8. Unit Price: Amount stated in Bid Form as price per unit of material or labor.
9. Bidder: One who submits Bid for prime contract with Owner for Work described in Bidding Documents.
10. Sub-bidder: One who submits bid for portion of Work to Bidder.

- B. Definitions established in AIA Document A201, General Conditions of the Contract for Construction 1997 Edition or other Contract Documents are applicable to Bidding Documents.

1.03 EXAMINATION OF PLANS, SPECIFICATIONS AND SITE WORK

- A. The Bidder is required, before submitting his proposal to visit the site of the Work and familiarize himself with the nature and extent of the Work and any local conditions, that

may in any manner affect the Work to be done and the equipment, materials and labor required, he is also required to examine carefully the plans and specifications and the Contract Documents and required to inform himself thoroughly regarding any and all conditions and requirements that may in any manner affect the to be performed under the Contract. Ignorance on the part of the General will in no way relieve him of the obligations and responsibilities assumed the Contract. Submission of said Bid is an affirmation that the Contractor has fulfilled these requirements.

1.04 EXPLANATION TO BIDDERS

- A. No oral explanation in regard to the meaning of drawings and specifications will be made and no oral instructions will be given before the award of the Contract.

1.05 EXPLANATION FOR DISCREPANCIES AND OMISSIONS

- A. Should a Bidder find discrepancies or omissions in the drawings or specifications, or in doubt as to their meaning, he shall notify the Architect at once in writing, and the Architect will send a written addendum to all on record as having drawings and specifications. The Architect will not be responsible for any oral instructions.

1.06 FAMILIARITY WITH LAWS

- A. The Bidder is understood to be familiar with all Federal, State and Local laws, ordinances, rules and regulations, that in any manner affect the Work. Ignorance on the part of the Bidder will in no way relieve him from responsibility.

1.07 PREPARATION AND SUBMISSION OF BIDS

- A. Each Bidder shall utilize the enclosed Bid Form. Any erasures, corrections or modifications in the proposal must be explained or noted over the signature of the Bidder. Proposals containing any conditions, omissions, unexplained erasures, alterations, items not called for, or irregularities of any kind, may be rejected by the Owner. A binding signature and title from an authorized agent of the Bidder is required on the Bid Form.

1.08 DISQUALIFICATION OF BIDDERS

- A. More than one bid from an individual, firm, partnership, Corporation or association under the same or different names will not be considered. Reasonable grounds for believing that a Bidder has interest in more than one proposal for the same work will cause the rejection of all proposals in which such Bidders are believed to have interests.

1.09 RECEIPT AND OPENING OF BIDS

- A. Bids will be opened in private at the time and place stated in the Invitation to Bid. The officer whose duty it is to open them will decide when the specified time has arrived and no bids received thereafter will be considered. No responsibility will be attached to any officer for the premature opening of a bid not properly addressed and identified.

1.10 AWARD OF CONTRACT

- A. The Contract will be awarded as soon as possible to the lowest responsible Bidder and/or the Bidder with the lowest construction time frame, provided his bid is reasonable and it is to the interest of the Owner to accept it.
- B. The Owner reserves the right to waive any informality in bids received when such waiver is in the interest of the Owner.

- C. Each Bidder shall, if so requested by the Owner, present evidence of his experience, qualifications and ability to carry out the terms of the Contract, including a financial statement.

1.11 REJECTION OF BIDS

- A. The Owner reserves the right to reject any and all bids when such rejection is in the interest of the Owner, and to reject the bid of a Bidder who is not in a position to perform the Contract or any Bidder who fails to satisfy the confidence of this Owner in regard to their ability to perform this contract.

1.12 BID SECURITY (BID BOND)

- A. Not Applicable.

1.13 PERFORMANCE BOND AND LABOR AND MATERIAL PAYMENT BOND

- A. The Contactor selected must be able to furnish a Performance and Payment Bond, which will be issued on the date of the signing of the Contract and shall be in the total amount of the Contract Sum. The life of the bond shall extend twelve (12) months beyond the date of final payment. Cost of said bond shall be paid for by the Contractor and shall be included in the base bid. The Contractor shall submit with his bid, evidence in the form of a letter from his bonding agent, of his ability to furnish Performance and Payment Bond. See Section 01300 - Submittals - for required forms and format.

1.14 TIME OF COMPLETION AND LIQUIDATED DAMAGES

- A. Completion of project shall be as indicated on the Bid Form
- B. Liquidated Damages: There shall be three hundred, fifty dollars-per-day (\$350) penalty for each unauthorized day beyond project construction time as indicated on the Bid Form.
- C. Construction time shall commence with the issuance of the building permit, the Notice To Proceed and/or Notice of Commencement and shall cease upon the receipt of Certificate of Occupancy and issuance of Certificate of Substantial Completion.

1.15 BUILDER'S RISK INSURANCE

- A. Peoples State Bank will provide property insurance as prescribed in Section 11.3 of the AIA General Conditions (AIA Document 201) 1997 Edition.
- B. Contractors, sub-contractors and vendors are responsible for provide insurance for the full replacement cost of all tools and equipment they bring on or store at the construction site. This will represents written notification of modification to Section 11.3 Property Insurance as prescribed in Paragraph 11.3.11.

1.16 ADDENDA

- A. Bidders and Sub-bidders requiring clarification or interpretation of the Bidding Documents shall make a written request which shall reach the Architect at least seven (7) days prior to the date for receipt of bids.
- B. Any interpretation, correction or change of the bidding documents will be made by Addendum. Interpretations, corrections or changes of the Bidding Documents made in other manner will not be binding, and Bidders shall not rely upon such interpretations, corrections and changes.

- C. All addenda, clarifications, or other pertinent pre-bid documentation will be issued to the General Contractor only. It is the responsibility of the General Contractor to provide copies of such documentation to Subcontractors from whom bids have been solicited. Submission of said Bid is an affirmation that the Contractor has fulfilled these requirements.

1.17 SUBSTITUTIONS

- A. The materials, products and equipment described in the Bidding Documents establish a standard required function, dimension, appearance and quality to be met by any proposed substitution.
- B. No substitution will be considered unless written request for approval has been received by the Architect at least ten (10) days prior to the date for receipt of bids. Each such request must be submitted on completed copy of the "Product Substitution" Form - Section 00150. The "Product Substitution Form" must be accompanied by drawings, cut sheets, product data, performance and test data and any other information necessary for an evaluation.

Product Substitution Form must also be approved and signed by the General Contractor.

- C. Where the word "Product" appears herein, it shall mean material, equipment assembly, manufacturers, brands, trade name, items or similar description as applicable.
- D. Where the words "Equal to", "Approved Equal" or other synonymous terms are used, it is expressly understood that they shall mean that the approval of any such submissions is vested in the Architect whose decisions shall be final and binding upon all concerned. All submissions are subject to such approval.
- E. Wherever any product is specified in accordance with "Federal Specifications, and ASTM Standard or other association standard," the General Contractor shall present an affidavit from the manufacturer certifying that the product complies with the particular standard specification. Where necessary and required or specified, support test data shall be submitted to substantiate compliance.
- F. Wherever any product is specified or shown by describing proprietary items, model numbers, catalog numbers, manufacturer trade names or similar reference, the Bidder obligates himself to submit proposals and accept award of contracts based upon the use of such products. Use of such reference is intended to establish the measure of quality, which the Architect has determined as requisite and necessary for the project. Where two (2) or more products are shown or specified, the Bidder has the option of which to use, provided the products meet all requirements of specifications and design criteria. The right is reserved to approve or disapproved deviations in design, function, construction or similar difference that will affect the design intent.
- G. The products of other manufacturers, whether listed or not, will be considered for use, if in the Architect's opinion the items substituted are equal to those specified. To make substitution, General Contractor shall submit to the Architect two (2) copies of each item indicating the manufacturer's name, plan and specification name and designation. Also, the manufacturer's printed specifications and shop drawings, which shall include dimensions, capacities or ratings, kind of material, finish, guarantee, etc., and such detailed information as the Architect may require. Products that do not meet the project specification will not even be considered without a credit, and submission of insufficient data shall be reason enough to have a substitution rejected.

- H. Where dimensions, connections, etc., vary from that in the basic specified product, the General Contractor shall bring these conditions to the attention of the Architect. The General Contractor shall assume all responsibility for coordinating any changes required in affected areas, materials and trades associated with such conflicts or variations.

1.18 SCHEDULE OF VALUES

- A. The Contractor shall submit a Schedule of Values in accordance with the following table:

BANK:

PROJECT:

CONTRACTOR:

DATE PREPARED:

I. SITEWORK

General Conditions
Site Demolition
Earthwork/Sitework
Paving
Site Concrete
Site Utilities
Site Electrical & Lighting
Landscape & Irrigation
Miscellaneous Items

Profit and Overhead

II. BUILDING

General Condition
Building Demolition
Concrete
Masonry
Structural Steel
Rough Carpentry
Columns
Wood Trusses
Finish Carpentry
PVC Trims & Sheets
Millwork
Insulation
Vinyl Soffit
Roofing
Cupola
Dormers
Flashing & Sheet Metal
Gutters & Downspouts
Sealants
Doors & Frames

Entrances & Storefront
Windows
Finish Hardware
Glass and Glazing
Gypsum Wallboard Systems
Acoustical Ceiling
Resilient Flooring
Ceramic Tile
Carpet
Paint
Wall Covering
Toilet Accessories
Interior Signage
Fire Extinguishers & Cabinets
Appliances
H.V.A.C.
Plumbing
Electrical
Miscellaneous Items

Building Permit(s)

Performance & Payment Bond

Profit and overhead

TOTAL BUILDING:

TOTAL PROJECT COST:

END OF SECTION

SECTION 00150

PRODUCT SUBSTITUTION FORM

To:

DESIGN SERVICES INCORPORATED

Product Substitution

PROJECT: _____ DATE: _____

We hereby submit, under transmittal letter of _____, General Contractor, for your review, the following PRODUCT SUBSTITUTION of the specified material for the above project.

Section	Paragraph	Specified Material
_____	_____	_____
Drawing	Detail/Section	Specified Material
_____	_____	_____

PROPOSED SUBSTITUTION _____

REASON FOR SUBSTITUTION _____

Attached is complete technical data, including product description, specifications, drawings, photographs, performance data adequate for evaluation of the PRODUCT SUBSTITUTION, highlighted or underlined for easy reading, including laboratory tests, as necessary, in duplicate.

Included is complete information on changes to the Construction Documents required by the proposed PRODUCT SUBSTITUTION for its proper installation.

- A. The Contractor, under whose transmittal this information is sent, has reviewed the PRODUCT SUBSTITUTION and agrees it is applicable to this project in the location described and agrees to warrant/guarantee the use of the PRODUCT SUBSTITUTION in the same manner he would the Specified Product.

() Yes () No If not, Explain: _____

- B. Does the PRODUCT SUBSTITUTION affect dimensions shown on the Drawings in ANY way? If so, how?

- C. Does the undersigned have a written agreement that the Manufacturer/Supplier will pay for any changes to the building design or building assembly system including architectural, engineering, and detailing costs, caused by the requested PRODUCT SUBSTITUTION? If so, to what extent?

D. What effect does the PRODUCT SUBSTITUTION acceptance have on other trades? Attach additional sheets if required.

() None () Don't Know As Follows: _____

E. What effect does the PRODUCT SUBSTITUTION acceptance have on surrounding construction (integrity, fire rating, penetrations, supports, location, layout, etc.)? Attach additional sheets if required.

() None () Don't Know As Follows: _____

F. What effect does the PRODUCT SUBSTITUTION acceptance have on Building Systems requirements (HVAC, Electrical, Plumbing, etc.)? Attach additional sheets if required.

() None () Don't Know As Follows: _____

G. Differences between proposed PRODUCT SUBSTITUTION and the Specified Product? Be Specific. (ASTM NO., Size, Gauge, Material, Color Availability, Construction, etc.). Attach sheets if required.

H. Manufacturer's guarantees and warranties of the PRODUCT SUBSTITUTION and the Specified Item are:

() Same () Different (Explain) _____

I. What is the cost differential of the PRODUCT SUBSTITUTION in comparison to the Specified Product?

() None () Less Expensive by \$_____ () More Expensive by \$_____

J. What is the construction time differential resulting from this PRODUCT SUBSTITUTION in comparison to the Specified Product?

() Same () Less by _____ days () More by _____ days

K. Is there a National Evaluation Report or a SBCCI Evaluation Report for the product or material?

() Yes () No

If Yes, attach copy of to this Product Substitution Form.

The undersigned states that the function, appearance, and quality of the PRODUCT SUBSTITUTION are equivalent or superior to the Specified Item.

Submitted By: _____ (Print or Type)

Signature _____

Date: _____

Firm _____

Address _____

General Contractor _____

☐ Agrees to Item "A" above

☐ Agrees to pay for any changes to the building design or building assembly system including architectural, engineering, and detailing costs, caused by the requested PRODUCT SUBSTITUTION not covered by the Manufacturer/Supplier.

Signature _____

Title _____

Date: _____

Architect/Engineers Recommendation to Owner

☐ Accepted

☐ Accepted As Noted

☐ Rejected With Cause

Remarks _____

Signature _____

Date: _____

Owner Decision

☐ Product Substitution Approved for Incorporation into Contract Documents.

☐ Product Substitution Disapproved.

Signature (Owner/Representative) _____

Date: _____

END OF SECTION



SECTION 00700

GENERAL CONDITONS

PART 1 GENERAL

1.01 DESCRIPTION

- A. All work subject to the A.I.A. General Conditions, Document A201, 1997, Edition Articles 1 through 14, which is hereby made a part of these Specifications.

END OF SECTION



SECTION 00810

SUPPLEMENTARY GENERAL CONDITION

PART 1 GENERAL

1.01 GENERAL

- A. These Supplementary General Conditions take precedence over and modify the General Conditions, A.I.A. Documents A-201, 1997 Edition, which are a part of the Contract Documents.
- B. In those instances that an article of the A.I.A. General Conditions is amended, modified, voided or superseded by the Agreement, the provisions of such articles not specifically amended, modified or superseded shall remain in effect.

PART 2 MODIFICATIONS

2.00 MODIFICATIONS

- A. Article 2 - Owner
 - 1. Paragraph 2.2 - information and Services Required by the Owner
 - a. Subparagraph 2.2.5: Delete and substitute the following:

"All copies of the drawings and specifications used in the bidding shall be forwarded to the lowest bidder for use in construction free of charge."
- B. Article 3 - Contractor
 - 1. Paragraph 3.5 - Warranty
 - a. Add the following Subparagraph:

3.5.2: All warranty and guarantees shall extend for one full year from the date stated on the Certificate of Substantial Completion unless warranties or guarantees of a longer period of time are in the technical sections of the specifications.
 - 2. Paragraph 3.7 - Permits, Fees and Notices
 - a. Paragraph 3.7.1: Delete & Substitute the following:

"The Contractor shall pay for all permits, governmental fees, licenses, inspection necessary for the proper execution & completion of the work, which are customarily secured after execution of the Contract. Impact Fees and connection/tap fees shall be secured by the Contractor but paid for by the Owner."
 - 3. Paragraph 3.9 - Superintendent
 - a. Paragraph 3.9.1: Delete & Substitute the following:

The General Conditions of the Contract shall provide for a "Full Time" superintendent based upon Contract duration. The Contractor shall employ a competent, "Full Time" superintendent and necessary assistants who shall be in attendance at the Project site during the performance of the Work. The Owner reserves the right to reject Superintendent. Once a specific individual is identified as the Project "Superintendent", they shall remain so for the duration of Work. Any change of Superintendents during the course of the Work shall be subject to Owner review and approval. The superintendent shall represent the Contractor, and communications to the superintendent shall be as binding as if given to the Contractor. Important communications shall be confirmed in. Other communications shall be similarly confirmed on written request in each case.

4. Paragraph 3.12 - Shop drawings, product data and samples.

a. Add the followings subparagraph:

3.12.11: Responsibility for the structural design of special structural components described in any section of the specifications on the drawings requiring a professional engineer's signature, is delegated to the supplier of the work required by that section who shall act as a Specialty Engineer as defined by the State of Florida Board of Professional Engineers.

Note: Where the AISC Code of Standard Practice for Steel Buildings and Bridges is referenced in the Specifications, the requirements of the specialty Engineer stated above are required even though this requirement may be in conflict with the AISC Code of Standard Practice for Steel Buildings and Bridges.

5. Paragraph 3.14 - Cutting and Patching Work

a. Add the following subparagraph:

3.14.3: Each specification section shall include all cutting, patching, and digging for that trade section, unless otherwise stated therein, as required for proper accommodation of all work of other trades. This, however, does not relieve the General Contractor from responsibility for stated in Paragraph 3.14.1 of General Conditions.

6. Paragraph 3.15 - Cleaning Up

a. Add the following subparagraph:

3.15.3: In addition to removing rubbish and leaving the building broom clean, the Contractor shall clean all tile and replace broken glass, remove stains, paint spots, and dirt from decorated work in areas which should otherwise be clean; clean and polish all plumbing and equipment and remove all temporary protection items. There shall be no materials buried either inside the building or outside on the site.

C. Article 7 - Changes in the Work

1. Paragraph 7.3 - Construction Change Directives

a. Sub-subparagraph 7.3.3.1 - Delete

- b. Sub-subparagraph 7.3.3.2 - Delete
- c. Sub-subparagraph 7.3.3.3 - Delete
- 2. Subparagraph 7.3.6: In the middle of the paragraph:
 - a. Delete the words, "A reasonable allowance for overhead and profit".
 - b. Substitute the following: "The overhead and profit allowed on all changes shall be 5% overhead and 5% profit for work performed by the Contractor. For work performed by a Subcontractor, the overhead and profit shall be 5% overhead and profit for the Subcontractor and 5% overhead and profit for the Contractor".
- D. Article 9 - Payments and Completion
 - 1. Paragraph 9.4 - Certificates for Payment
 - a. Add the following subparagraph:

9.4.3: Refer to Project Manual Section 1310 - Schedules, Logs, and Payment.
- E. Article 11 - Insurance & Bonds
 - 1. Subparagraph 11.1.1 - Delete
 - 2. Add the following subparagraph:

11.1.1 The General Contractor, Subcontractor, or Vendor, at its sole cost and expense shall obtain, maintain, and keep in full force and effect the following types of insurance, for which the Contractor, Vendor, or Subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable.

Contractor shall not commence work in connection with this agreement until he has obtained all of the following insurance and such insurance coverage has been approved by the Owner. Contractor shall not allow any subcontractor to commence work on his subcontract until all similar of the subcontractors have been so obtained and approved. All insurance policies shall be issued by insurers licensed in Florida and qualified to do business in Florida.
 - 3. Add the following sub-subparagraph:

11.1.1.1 Worker's Compensation Insurance: Worker's Compensation in statutory limits; with employer's liability of \$1,000,000.00 each accident; \$1,000,000.00 disease, per employee.

Contractor shall purchase and maintain during the life of this Agreement Worker's Compensation Insurance for all his employees. Such insurance comply with the Florida Worker's Compensations Law. In the event any class of employee engages in hazardous work under this contract at the site the project and is not protected under the Worker's Compensation statue, Contractor shall provide, and cause each subcontractor to provide, adequate insurance for protection of his employees not otherwise protected. This insurance shall meet all the requirements of this article.

4. Add the following sub-subparagraph:

11.1.1.2 Comprehensive General Liability: Comprehensive General Liability Insurance in the amount \$1,000,000.00 per occurrence. This policy provide coverage for claims against bodily injury, personal injury, and property damage, and will include coverage for: premises and operations; product/completed operations; broad form property damage; broad form contractual liability. This policy will be primary and non-contributory.

5. Add the following sub-subparagraph:

11.1.1.3 Umbrella Liability: Umbrella Liability Insurance to \$5,000,000.00 limit to follow form and be in excess of all liability policies.

6. Add the following sub-subparagraph:

11.1.1.4 Property Insurance: Property Insurance for full replacement cost of all tools and equipment brought onto the premises. The policy will contain a waiver of subrogation.

7. Add the following sub-subparagraph:

11.1.1.5 Sub-Contractor Commercial General Liability must be in the amount of \$1,000,000.00 per occurrence. Demolition Contractor General Liability must be in the amount of \$2,000,000.00 per occurrence. All other insurances shall remain the same as the General Contractors.

8. Add the following sub-subparagraph:

11.1.1.6 Automobile Liability Limits of \$1,000,000.00 CSL, \$2,000,000.00 Aggregate.

9. Sub-subparagraph 11.1.3: add the following:

All insurance policies must be issued by insurers rated not less than A-XII by Best's Key Rating Guide. Certificate(s) of Insurance with an original signature of the issuing agent must be provided to PEOPLES STATE BANK evidencing required coverage to at least 30 days prior to commencement of work. Certificate(s) shall be endorsed to provide 30-day written notice of termination, cancellation, or material change of coverage. The words "endeavor to" in the standard language found in "Cancellation" block of a standard certificate of insurance MUST BE CROSSED OUT/DELETED AND INITIALED by the insurance company.

Each certificate must be issued as follows:

Peoples State Bank
350 SW Main Boulevard
Lake City, Florida 32056-2199

PEOPLES STATE BANK, its Officers, Boards and Commissions, and members thereof, its Employees and Agents are covered as Additional insured as respects to any liability arising out of the activities of the Named Insured. The general liability insurance policy noted above is primary, and Additional Insured endorsement is being requested of the Insurance Company. A waiver of Subrogation is granted on (above policies) in favor of PEOPLES STATE BANK. The Certificate shall include and name these following as Additional Insured. Please note that the spelling of these parties must be exactly correct or the

insurance will not be valid to PEOPLES STATE BANK, and work will not be allowed to commence:

PEOPLES STATE BANK

Original Certificates of Insurance with an original signature of the issuing agent must be provided to PEOPLES STATE BANK before Contractor commences work. SunTrust Banks, Inc. shall be the Certificate Holder.

10. Add the following sub-subparagraph:

11.1.4 Hold Harmless Agreement: Contractor assumes the entire responsibility of performance of the work under this contract. Contractor further expressly agrees to indemnify (1) and Hold them harmless PEOPLES STATE BANK, its directors, officers, and employees of from any all claims for bodily injury, death, personal injury or property damage and any other losses, damages, charges or expenses, including Attorney's Fees, which arise out of, in connection with or by reason of the of the work described above, or which are alleged to have arisen out of, (2) or in connection with the performance of such work.

Contractor further agrees to undertake at his own expense, the defense of any action which may be brought against PEOPLES STATE BANK, claiming damages which are alleged to have arisen out of, by, or in connection with their performance of the work under this contract. This hold harmless agreement shall survive the contract.

11. Add the following sub-subparagraph:

11.3.1.5: Peoples State Bank will provide property insurance as prescribed in Section 11.3 of the AIA General Conditions (AIA Document A201, 1997 Edition).

Contractor, Subcontractors, vendors, etc. shall provide Property Insurance for full replacement cost of all tools and equipment brought onto the premises. The policy will contain a waiver of subrogation. See Item No. 7 above.

Contractor shall provide the following information to the Owner so that the Owner can secure Builder's Risk Property Insurance:

1. Address or legal description
2. Construction type (masonry, frame, etc.)
3. Area of building
4. Number of Stories
5. Date construction started
6. Date construction to be completed
7. Value of building

F. Article 13 - Miscellaneous Provisions

1. 13.5 Tests

a. Add as follows:

13.5.7 All tests and certificates of tests as specified and required by the individual sections of the specifications shall be not over six months old at time submitted by the Architect.

END OF SECTION



SECTION 00910

SPECIAL CONDITIONS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. These special conditions shall complement and take precedence over the General Conditions and Supplementary General Conditions.

1.02 LAYING OUT

- A. The Contractor shall immediately, upon entering project site for purpose of beginning work, locate all general reference points and take necessary action to prevent their destruction; lay out his own work and be responsible for all lines, elevations and measurements, of the building, grading utilities and other work executed by him under the Contract.
- B. Lines and levels shown on the drawings were prepared from recent data supplied by a registered surveyor. The Contractor shall verify that the existing field conditions are as indicated on the drawings, and if found different, shall promptly report variations in writing to the Architect.
- C. The Contractor must exercise proper precaution to verify the dimensions and figures shown on the drawings before laying out work and will be held responsible for any errors resulting from his failure to exercise such precautions.

1.03 REQUIRED INSPECTIONS

- A. Forty-eight hours prior to the covering of embedment of any items or products, the Contractor shall notify the Architect to review and/or request an on-site inspection.

See Section 01060 Consultant Inspections (if applicable).
- B. No later than Twenty-Four hours prior to the covering of embedment of any items or products, the Contractor shall notify the necessary governmental inspection agencies.
- C. In the case of concrete reinforcing, all bars shall be in place and tied, twenty-four hours prior to any requested or required inspection.

1.04 RECORD DRAWINGS

- A. Record drawings of the completed project on which the Contractor shall have recorded project changes. Included shall be the location by dimension from building walls of all buried construction, inside and outside the building. In addition, the Contractor shall provide one (1) copy of such drawings in "blueprint" print set on which he shall have recorded, in colored pencils, all such changes. Included shall be the location by dimension from building walls of all buried construction, inside and outside the building.

1.05 PROTECTION OF PROPERTY AND WORK

- A. General Contractor responsible for any damage from conduct of the work.
- B. Provide guard rails, lights and shelter, etc. where necessary.

- C. Safety is the responsibility of the General Contractor.

1.06 LOCATION OF ITEMS

- A. Follow plans and specifications. Complete all work for the project to the Owner satisfaction.

1.07 CUTTING AND PATCHING

- A. Each sub-contractor or trade responsible for cutting and patching his own work.
- B. The General Contractor and sub-contractors shall inspect existing condition of Work, including elements subject to movement or damage during cutting and patching and after uncovering work, inspect the condition affecting installation of new products giving notification to Owner of any anticipated problems.
- C. Execute cutting by methods, which will prevent damage to other Work, and will provide surfaces to receive installation of repairs and new Work.
- D. Refinish entire surfaces as necessary to provide an even finish.
 - 1. Continuous surfaces: to nearest intersections.
- E. Mechanical and electrical trades shall be responsible to perform all cutting required in connection with their work and bear all cost resulting there from. Patching shall be done by workmen skilled in the trade required for the patching work. All labor jurisdictional rules and regulations shall be satisfied and the patching work performed in a workmanlike manner. These trades shall furnish and locate all sleeves required before the new walls are built, or the General Contractor shall be responsible for the cost of cutting and patching required for pipes where sleeves and inserts were not installed or where incorrectly installed or located.
- F. In existing areas with normal alterations the Mechanical and Electrical trades shall note the extent to General Construction alteration and refinishing work required to be performed by the General Contractor. The various trades shall cooperate so to schedule their work to minimize cutting, patching and restoration.
- G. The General Contractor shall be responsible for all core drilling of concrete as necessary for the installation of electrical work if required. The location shall be subject to the Owner's approval.
- H. Where new and altered work is already finished, patching and refinishing shall be done by the General Contractor at his expense.
- I. Where ducts and other heating and ventilating apparatus passing through walls, grilles, registers, louvers, etc. are shown the openings in the walls shall be neatly cut and finished to received covers.

1.08 LONG LEAD ITEMS

- A. General Contractor shall submit a list of all items that are anticipated to require more than four (4) weeks delivery together with scheduled ordering and delivery timetable, for discussion and review.

1.09 REDESIGN

- A. If the General Contractor makes, or causes to be made, due to approval of a substitute or otherwise, any substantial change from the drawings, he shall pay all costs arising from such change, including Design and Engineering fees required to check the adequacy of such changes.

1.10 LOST OR STOLEN ITEMS

- A. The General Contractor shall replace, at his expense, all lost or damaged or stolen items or materials which are stored at the site or incorporated in the work, whether or not such items have been entirely or partially paid for by the Owner.

1.11 N.I.C. ITEMS

- A. Designates items not to be provided by the General Contractor. This does not eliminate the General Contractors responsibility for coordinating with installation of N.I.C. items.

1.12 WORK SEQUENCE REQUIREMENTS

- A. The approved Progress Schedule, as defined and described in the Section 01310 Schedule, Logs, Payments, will establish and control the sequence and timing for the work of this Project. (The Schedule shall have the agreement of involved parties prior to construction.)
- B. Requirements related to Owner's Operations at existing occupied facilities for Additions, Alterations or Renovations (if applicable):
 - 1. The Owner will occupy parts of the existing space during normal hours and also for after hours.
 - 2. Unforeseen or unavoidable conflict with, or interruption of the Owners operations will be considered in such a way so as to not restrict progress of General Contractor.
 - 3. Work should be coordinated to permit Owners operation of existing office areas during construction.
 - 4. Work in tenant space is available for demolition and construction upon notice by Owner.

1.13 ALTERATIONS/DEMOLITION

- A. The General Contractor shall be responsible for and shall protect adjoining public and private property, including thoroughfares, from damage due to his demolition and disposal operations.
- B. Mechanical and electrical demolition shall be performed concurrent with and in coordination with general construction demolition.
- C. Do not allow demolition materials to accumulate inside or outside of existing building. Remove from the site all rubbish and debris resulting from work of demolition. Material to be removed by using the elevator shall be put in closed containers.
- D. Protect surfaced to remain. Cut along neat lines and to logical planes to allow for patching to uniform, continuous surfaces.

- E. Should any portion of the existing surfaces, which are scheduled to remain, be damaged due to demolition work, the conditions and circumstances shall be reported to the Owner and all necessary repairs and replacements to such damaged work shall be made, at no extra cost to the Owner, with new materials to match existing in every respect.
- F. The adjacent existing spaces shall not be used as a workshop. Neither shall the furnishings or equipment in any rooms be used as workbenches. Should any damage occur during the progress of the work to any furniture, fixtures, equipment or appurtenances therein, such damage shall be repaired, replaced or made good by the responsible General Contractor without extra cost to the Owner.
- G. All work shall be performed in strict accordance with the approved Progress Schedule.
- H. No existing services shall be stopped or interfered with without prior approval and coordination with the Owner.
- I. Protection:
 - 1. The General Contractor shall be responsible for and shall protect adjoining public and private property, including thoroughfares, from damage due to his demolition and disposal operations.
 - 2. The General Contractor shall be responsible for and shall protect construction to remain from damage, and shall provide and maintain all necessary temporary protection due to his work.
 - 3. The General Contractor shall be responsible for the protection of the existing building, facilities and improvements within the areas where his work is being done. Any disturbance or damage to the work, the existing building, and improvements or any impairments of facilities resulting from work of this Section, shall be promptly restored, repaired or replaced at not extra cost to the Owner by the responsible General Contractor.
 - 4. In the areas of the building where any Construction work is required, the General Contractor shall provide all necessary temporary partitions, enclosures, guardrails, barricades, etc. to adequately protect all persons from possible injury.
 - 5. Provide temporary dustproof partitions or properly hung tarpaulins, depending on the type of work to be done, between existing construction and areas occupied by Owner.
 - 6. Provide temporary protection for completed surfaces in the work. Maintain such temporary work in good repair during the Contract and remove after work is completed. Repair work damaged by temporary protection. All surfaces shall be clean and unmarred upon delivery of building to the Owner. Without extra compensation, refinish all surfaces in such spaces where these surfaces prove to have been inadequately protected and area damaged. Where required to allow interior finishing work to proceed, provide temporary enclosures over openings pending installation of doors, windows and glazing work.
- J. The Owner will remove all furniture and other small loose items to be retained from the various areas before demolishing operations area started.
- K. All lighting fixtures, carpeting, cabinetry, equipment or apparatus not to be reused shall be delivered to the Owner at a location on the premises designated by the Owner, unless the Owner specifically states that he does not want the equipment, fixtures or apparatus; in

which case, they may become property of the General Contractor who shall remove them from the premises.

- L. Debris and products of demolition not designated for reuse or delivery to the Owner shall be removed from the premises before layout of construction.
- M. Where equipment, fixtures or apparatus are removed from back of finish surfaces, the existing piping, conduit or ductwork shall be capped and sealed as so as to permit patching and refinishing of these surfaces. Where required, metal plates shall be installed to identify these locations.
- N. Where piping, valves, conduits, ductwork, etc, are required to be removed, altered or tapped for new connections or extensions, disconnecting and removal work shall be done in such a manner as to prevent damage to the remaining work, equipment, materials, or finishes, and if damaged in making such removals, General Contractor shall be responsible for the full resulting cost. No existing piping, fittings, valve, conduit, wire, switches and other related work, once removed, shall be permitted to be reused unless specifically so balanced as required for proper operation. Wherever existing pipe or duct covering or insulation is removed, it shall be replaced with new covering of a kind similar to that existing.
- O. Where new equipment is installed or existing equipment is altered to change its capacity or rating, related equipment, which is used in combination with this equipment shall be adjusted or replaced as required, with all necessary connections, to permit operation of the combined equipment at the new capacity or rating.
- P. Where architectural changes indicated on the drawings necessitate relocation and offsetting of existing heating, plumbing or electrical work, the General Contractor shall also remove and relocate the existing work made obsolete by, or interfering with, the work performed under other trades.
- Q. Contractors shall be responsible for performing their construction activities in such manner to maintain essential ingress and egress for visitors and occupants of Owner occupied areas and to continuously maintain all required emergency exits from and circulation between exiting facilities.
- R. The General Contractor shall acquaint himself with the general character of the Owner operations prior to commencing work and shall so schedule his work to avoid interference therewith. The sequence of demolition and alteration operations shall be in accordance with the approved Progress Schedule.
- S. All General Contractor activities within the area of Owner operation shall be carefully coordinated with the Owner and scheduled at least ten (10) consecutive calendar days in advance of anticipated occurrence. Unavoidable interference with Owner operations shall not be carried out without the Owner's written approval.
- T. Work scheduling shall take into full consideration the requirements of the Owner with respect to minimal disruption of existing functions by demolition and alterations, including the following:
 - 1. Electrical, gas, water, telephone and drainage service
 - 2. Accessibility to existing areas
 - 3. Fire and emergency exits
 - 4. Safety of occupants
 - 5. Noise of demolition and building operations

- U. The schedule of shutdowns and other interruptions of existing utilities shall have the approval of the Owner. No shutdowns will be allowed without prior clearance. Shutdown time shall be held to a minimum.

END OF SECTION

DIVISION 1 - GENERAL REQUIREMENTS

SECTION	01010	SUMMARY OF WORK	1 THRU 3
SECTION	01050	FIELD ENGINEERING	1 THRU 2
SECTION	01060	CONSULTANT INSPECTIONS	1 THRU 1
SECTION	01080	PROJECT SIGN	1 THRU 2
SECTION	01200	PROJECT MEETINGS	1 THRU 2
SECTION	01300	SUBMITTALS	1 THRU 5
SECTION	01310	SCHEDULES, LOGS, PAYMENTS	1 THRU 3
SECTION	01400	QUALITY CONTROL	1 THRU 3
SECTION	01402	STEEL QUALITY CONTROL	1 THRU 1
SECTION	01500	CONSTRUCTION FACILITIES & TEMP. CONTROLS	1 THRU 2
SECTION	01700	CONTRACT CLOSE-OUT	1 THRU 3
SECTION	01743	ROOF WARRANTY	1 THRU 3



SECTION 01010

SUMMARY OF WORK

PART 1 - GENERAL

1.01 DESCRIPTION

- A. The Contractor shall supply all labor, materials, plant facilities and skills necessary to complete construction. The project shall include but not be limited to construction and related work as shown and described in the drawings and specifications, as herein enumerated.

SPECIFICATIONS:

DIVISION 0	CONDITIONS OF THE CONTRACT
DIVISION 1	GENERAL REQUIREMENTS
DIVISION 2	SITWORK
DIVISION 3	CONCRETE
DIVISION 4	MASONRY
DIVISION 5	METALS
DIVISION 6	WOOD AND PLASTICS
DIVISION 7	THERMAL & MOISTURE PROTECTION
DIVISION 8	DOORS AND WINDOWS
DIVISION 9	FINISHES
DIVISION 10	SPECIALTIES
DIVISION 11	EQUIPMENT
DIVISION 12	FURNISHINGS
DIVISION 13	Not Applicable
DIVISION 14	CONVEYING SYSTEMS
DIVISION 15	MECHANICAL
DIVISION 16	ELECTRICAL

DRAWINGS:

GENERAL

0.01	COVER SHEET
0.02	PROJECT DATA SHEET
LS1.00	LIFE SAFETY PLAN

ARCHITECTURAL

A-1.10	FLOOR PLAN - NOTES
A-1.11	FLOOR PLAN - DIMENSIONS
A-1.12	FLOOR PLAN - PARTITION TYPES
A-2.10	REFLECTED CEILING PLAN
A-3.00	ROOF PLAN
A-4.00	MATERIAL FINISH SCHEDULE & CODE SCHEDULES
A-5.00	DOOR SCHEDULE, DOOR, FRAME STOREFRONT AND WINDOW ELEVATIONS
A-6.00	BUILDING ELEVATIONS
A-6.01	BUILDING ELEVATIONS

A-7.00	WALL SECTIONS
A-7.01	WALL SECTIONS
A-7.02	WALL SECTIONS
A-7.03	WALL SECTIONS
A-8.00	DETAILS - HEAD, JAMBS, & SILLS
A-8.01	DETAILS - HEAD, JAMBS, & SILLS
A-8.10	DETAILS - EXTERIOR
A-8.20	DETAILS - INTERIOR
A-8.30	DETAILS - ROOF
A-8.31	DETAILS - ROOF
A-8.50	DETAILS - FIRE RATED
A-9.00	INTERIOR ELEVATIONS
A-9.01	INTERIOR ELEVATIONS
A-10.00	MILLWORK DETAILS
A-10.01	MILLWORK DETAILS
A-10.02	MILLWORK DETAILS
A-11.00	PARTITION TYPES

INTERIORS

I-1.10	FINISH PLAN
I-2.10	FURNITURE AND EQUIPMENT PLAN

STRUCTURAL

S-0.00	STRUCTURAL GENERAL NOTES
S-0.01	STRUCTURAL GENERAL NOTES
S-1.11	FOUNDATION AND SLAB ON GRADE PLAN
S-3.00	ROOF FRAMING PLAN
S-3.01	HIGH ROOF FRAMING PLAN
S-8.00	SECTIONS AND DETAILS
S-8.01	SECTIONS AND DETAILS
S-8.02	SECTIONS AND DETAILS
S-8.03	SECTIONS AND DETAILS
S-8.04	SECTIONS AND DETAILS

PLUMBING

P1.0	FLOOR PLAN - PLUMBING
P2.0	SCHEDULE, DETAILS AND RISERS - PLUMBING

MECHANICAL

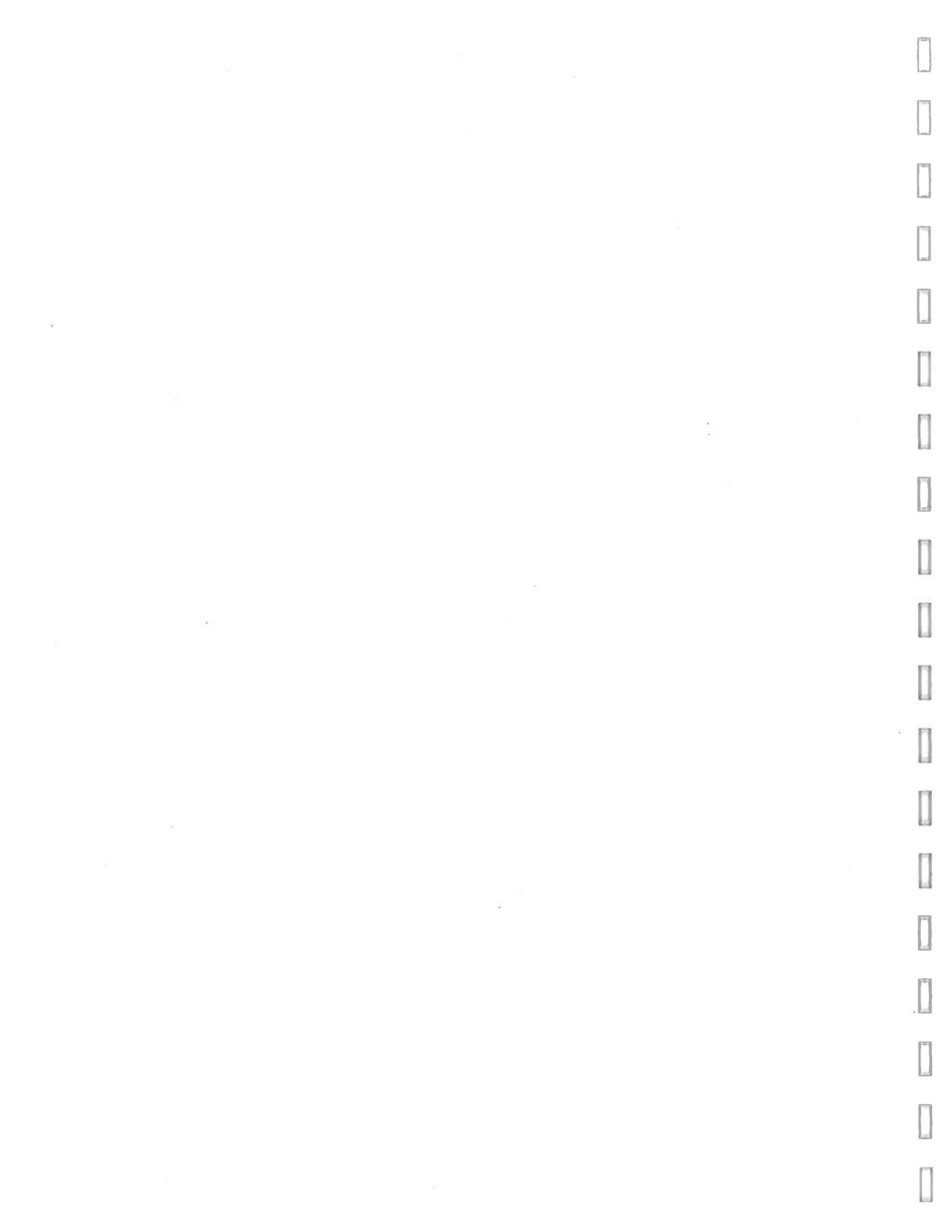
M1.0	FLOOR PLAN - HVAC
M2.0	DETAILS - HVAC
M3.0	SCHEDULES - HVAC

ELECTRICAL

E0.1	LEGEND & FIXTURE SCHEDULE
E1.0	SITE PLAN - ELECTRICAL
E2.0	LIGHT FLOOR PLAN - ELECTRICAL
E3.0	POWER FLOOR PLAN - ELECTRICAL

E4.0 SYSTEMS FLOOR PLAN - ELECTRICAL
E5.0 DETAILS - ELECTRICAL
E6.0 DETAILS - ELECTRICAL
E7.0 RISER DIAGRAMS & SCHEDULES - ELECTRICAL

END OF SECTION



SECTION 01050

FIELD ENGINEERING

PART 1 - GENERAL

1.01 RELATED REQUIREMENTS

- A. Division 1 - General Requirements of the project Manual governs the execution of all specification sections within Division 2 through 16.

1.02 REQUIREMENTS INCLUDED

- A. Furnish and pay for field engineering services required for project:
 - 1. Survey work required in execution of Project.
 - 2. Civil, Structural, or other professional engineering services specified or required to execute Contractor's construction methods.
- B. Contractor will identify existing control points and properly line corner stakes indicated on Drawings.

1.03 QUALIFICATIONS OF SURVEYOR OR ENGINEER

- A. Qualified engineer or registered land surveyor acceptable to Contractor and Owner.
- B. Registered professional engineer of discipline required for specific service on Project licensed in the State of Florida.

1.04 SURVEY REFERENCE POINTS

- A. Verify on the property, grades, lines, levels and dimensions indicated on drawings.
- B. Locate and protect control points prior to starting site work and preserve permanent reference points during construction.
 - 1. Make no changes or relocations without prior written notice to the Architect.
 - 2. Report to the Architect when reference point is lost, destroyed, or requires relocation because of necessary changes in grades or locations. Require surveyor to replace Project control point, which may be lost or destroyed. Establish replacements based on original survey control.

1.05 PROJECT SURVEY REQUIREMENTS

- A. Establish minimum of two permanent benchmarks on site, referenced to data established by survey control points. Record locations with horizontal and vertical data on Project Record Documents.

1.06 UNDERGROUND OBSTRUCTIONS

- A. Pipelines, existing underground installations and underground structures in vicinity of work are shown on Drawings according to best information available.
- B. Verify locations of underground pipelines, conduits and structures by contacting owners of underground utilities and by protecting in advance of excavation.
- C. Secure written permission from proper authority before initiating new construction over existing utilities. File copy of this written permission with Owner before commencing work. Furnish release from proper authority before final acceptance of work.
- D. Repair cuts to existing utilities made during construction process as part of Project Work to satisfaction of utility owner.

END OF SECTION

SECTION 01060

CONSULTANT INSPECTIONS

PART 1 - GENERAL

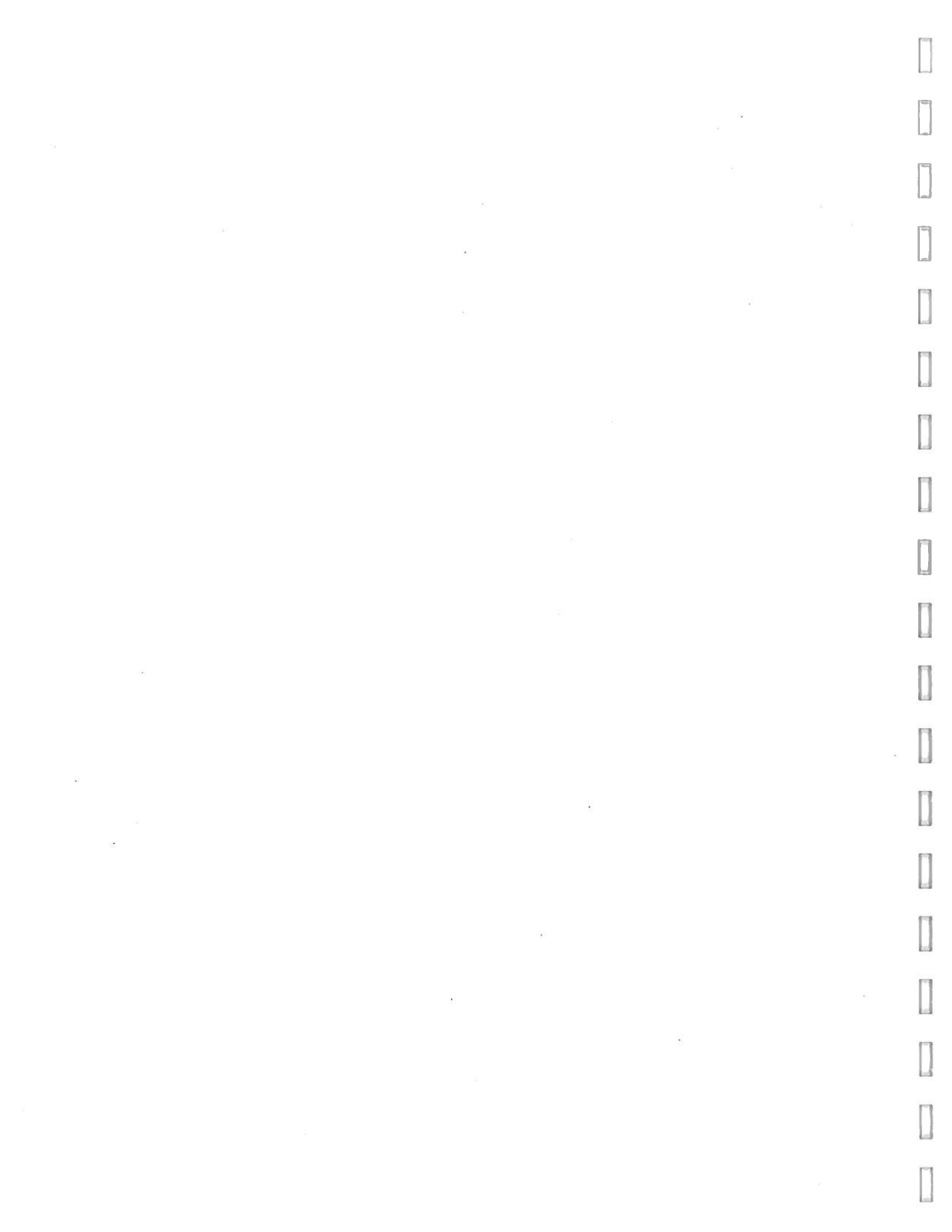
1.01 DESCRIPTION

- A. Coordination of Required Consultant Inspections.

1.02 INSPECTIONS

- A. The followings Consultant inspections are required to provide specific or periodic site inspections to verify compliance with the Construction Documents. The General Contractor is required to notify the Architect forty- eight (48) hours prior to the time when the Consultant inspection is needed.
 - 1. Civil
 - a. Substantial Completion Inspection
 - 2. Structural
 - a. Foundation Inspection (prior to placement of concrete)
 - b. Roof Framing Inspection
 - 3. Mechanical
 - a. Substantial Completion
 - 4. Electrical
 - a. Substantial Completion

END OF SECTION



SECTION 01080

PROJECT SIGN

PART 1 - GENERAL

1.01 DESCRIPTION

- A. The Contractor shall provide, install and maintain the job sign as shown or specified.
- B. Submit a shop drawing of the sign with footings, bracing and color samples.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Lumber shall be #2 pine or douglas fir pressure treated.
- B. Plywood shall be 3/4" marine plywood A/C.
- C. Securing devices shall be galvanized iron or cadmium plated.
- D. Paint shall be exterior grade acrylic or polymer acrylic and primer shall be as recommended by the manufacturer of the final paint utilized.

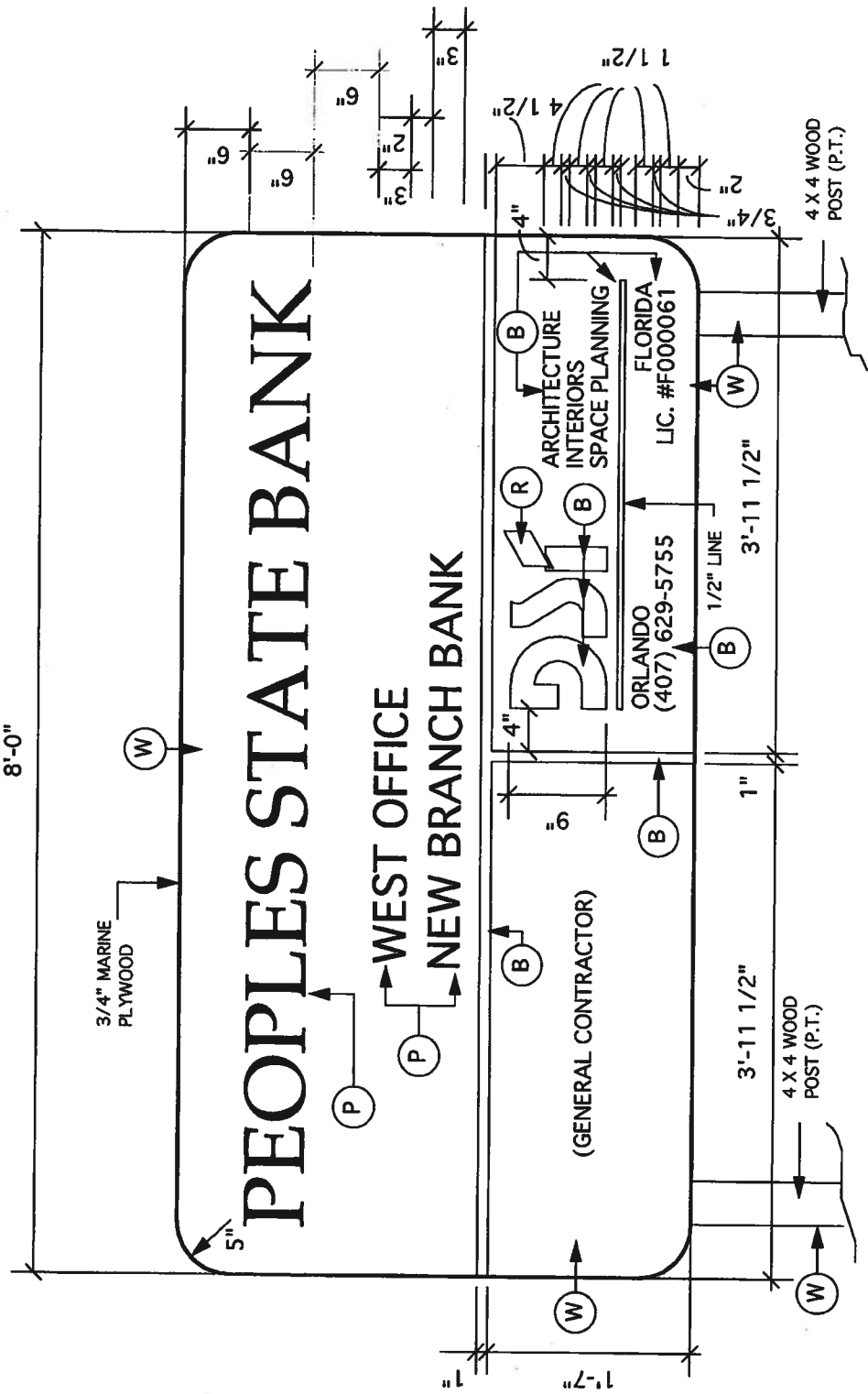
PART 3 - EXECUTION

3.01 PERFORMANCE

- A. Sign shall be constructed in accordance with good trade practices and designed to withstand normally anticipated wind loads; provide bracing.
- B. Sign shall be painted by an experienced sign lettering craftsman and shall conform to Architect's logo, firm name and letter style. Color and size of sign is as noted on drawings.
- C. Sign shall be maintained in good condition throughout the construction period and removed from the site upon completion of the project.

END OF SECTION





P = PEOPLES BLUE
 W = WHITE
 B = BLACK - FLAT
 R = RED - PATONE 03211

SECTION 01200

PROJECT MEETINGS

PART 1 - GENERAL

1.01 MATERIALS AND LABOR - PRODUCTION AND PROGRESS SCHEDULE

- A. Prior to Preconstruction Conference, the General Contractor shall confirm and verify the production, fabrication, shipping and installation schedules of all materials, products, etc. specified in this Project Manual and on the Drawings. The General Contractor shall notify the Architect (in writing) if any of these items adversely impact the Project Schedule.

1.02 MATERIALS AND METHODS OF CONSTRUCTION

- A. Prior to Preconstruction Conference, the General Contractor and Sub-Contractors shall thoroughly review materials, methods of construction, detailing, products, etc. of all items, specified in this Project Manual and shown on the Drawings. Conflicts or incompatibilities which affect proper installation or which may void manufacturer's warranties shall be identified. The General Contractor shall notify the Architect (in writing) if conflicts or incompatibilities are identified. No "Time Extensions" to Project Schedule will be considered without this notification. All "Time Extensions" are subject to verification of impact to "Critical Path" of construction as indicated in the Project Progress Schedule.

1.03 PRECONSTRUCTION CONFERENCE

- A. Before beginning work at the site, the General Contractor shall call a Preconstruction Conference with the superintendent employed for this project and representatives of Owner, Architect and major Subcontractors. At this time, all parties concerned will discuss the project under contract and prepare a program of procedure in keeping with requirements of the drawings and specifications. The superintendent shall henceforth make every effort to expeditiously coordinate all phases of the work, including the required reporting procedure to obtain the end result within the full purpose and intent of the plans and specifications for the project.
- B. Preconstruction Conference Submittals:
 - 1. Project Progress Schedule: The Contractor shall provide copies of Project Progress Schedule to all attendees. See Section 01310 for Progress Schedule requirements.
 - 2. Long Lead Items: Contractor shall provide a list of all of all items which are anticipated to required more than four (4) weeks delivery together with a scheduled ordering and delivery timetable, for discussion and review.
 - 3. The Contractor shall provide the Architect with two copies of the names and address (with telephone numbers) of all Subcontractors employed on this project.
- C. Preconstruction Conference Agenda: The following items comprise information, requirement, etc. to be reviewed and discussed in the Preconstruction Conference. The

information and requirements transmitted and the results of Preconstruction Conference discussions and agreements shall be considered part of the Contract and shall be so incorporated.

1. Project Data Directory
2. Contract Information
3. Certificate Submittals
4. Required Permits and Licenses
5. List of Subcontractors and Materials
6. Schedule of Values Submittal
7. Construction Schedule Submittal
8. Applications for Payment
9. Testing
10. Submittals
11. Meetings
12. Conflicts and Job Inspection
13. Correspondence
14. Contractor and Subcontractor Relationship
15. Owner, Architect, Contractor Relationship
16. Premises and Site Coordination
17. Using Agency Involvement
18. Reports
19. Control of Construction Changes
20. Time Extensions
21. Authority to Issue Changes
22. General Project Completion Information
23. Specific Project and Contract Completion Procedures
24. Questions and Discussions

1.04 PRE-ROOFING CONFERENCE

- A. Before beginning roofing work, the General Contractor shall call a Pre-Roofing Conference with the superintendent employed for this project and representatives of Owner, Architect, Roofing Consultant, and Roofing Contractor. At this time, all parties concerned will discuss the roofing installation, installation schedule, materials, methods of construction, and details as prescribed in the Contract Documents. Any areas of concern shall be noted at that time.

1.05 JOB MEETINGS

- A. The Contractor and his job representative shall attend all job meetings held at the job site at a frequency determined by the Owner. The Contractor shall have the request for payment available at those meetings coinciding with monthly visits.
- B. Any request for Change Orders shall be presented at the monthly meeting along with the substantiation for that change. Request for change orders will only be processed in the month they occur.
- C. Any request for a Change Order, which also generates a need for time extension to the project, must so state. Change Orders will be attached to the Pay Request in the month in which they occur. Change Order requests, which do not specifically request project time extensions shall be assumed to require no additional contract days.

END OF SECTION

SECTION 01300

SUBMITTALS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Required Pre-Construction Submittals.
- B. Construction Submittals

1.02 PROCEDURES

- A. Where required by accompanying documents or at the request of the Architect, the Contractor shall provide samples of materials and shop drawings for review by the Architect. Under no circumstances shall any material be purchased or installed prior to the receipt of the Architect's review.
- B. Shop drawings and submittals are to be prepared by the fabricator or installer of the submitted product. Under no circumstances are the Architect's (and/or consultant's) drawings or portion of said drawings to be reproduced and included as part of any submittal. Submittals containing such reproductions will be immediately rejected and returned to the General Contractor. Any request for time extension related to such a rejection will not be allowed.

PART 2 - PRE-CONSTRUCTION SUBMITTALS

2.01 PERFORMANCE BOND AND LABOR AND MATERIAL PAYMENT BOND

- A. Contractor shall submit two (2) copies for Owner and one (1) copy for Architect of executed Performance Bond and Labor and Material Payment Bonds per Section 00100 Instructions to Bidders.

Performance Bond and Payment Bonds are to be submitted utilizing the following forms:

Performance Bond:	AIA A312 Performance Bond 1984 Ed.
Payment Bond:	AIA A312 Payment Bond 1984 Ed.

Both bonds must be completed separately.

Both bonds must state that the "lift" (or duration) of the bond shall extend twelve (12) month beyond the date of final payment.

NO APPLICATIONS FOR PAYMENT WILL BE PROCESSED PRIOR TO RECEIPT OF BONDS.

2.02 BUILDER'S RISK INSURANCE (if applicable)

- A. Contractor shall submit two (2) copies of executed Builder's Risk Insurance Policy per Section 00100 Instructions to Bidders.

2.03 PROJECT PROGRESS SCHEDULE

- A. Contractor shall submit copy(s) of Project Progress Schedule for approval per Section 01310 Schedules, Logs, Payments.

PART 3 - CONSTRUCTION SUBMITTALS

3.01 BUILDING PERMIT

- A. Contractor shall submit two copies of all applicable Permits issued on the project to the Architect for record and distribution to the Owner.

3.02 LONG LEAD ITEMS

- A. Contractor shall submit two (2) copies of list of Long Lead Items per Section 00910 Special Conditions.

3.03 SHOP DRAWINGS

- A. Present drawings in clear and thorough manner.
- B. Identify details by reference to sheet and detail, schedule or room numbers shown on Contract Drawings.
- C. Consecutively number shop drawings for each section of Work. Retain numbering system throughout all revisions.
- D. Show detail, materials dimensions, thicknesses, methods of assembly, attachments, relationship, to adjoining Work and other pertinent data and information.
- E. Verify dimensions and field conditions. Clearly indicate field dimensions and field conditions.
- F. Check and coordinate shop drawings of any section or trade with requirements of other sections or trades as related thereto and as required for proper and complete installation of work.
- G. Prepare composite shop drawings and installation layout when necessary or requested to depict proposed solutions for tight field conditions. Coordinate in field and with affected subcontractors for proper relationship to work of other trades based on field conditions.

3.04 PRODUCT DATA

- A. Preparation
 - 1. Clearly mark each copy to identify pertinent products or models.
 - 2. Show performance characteristics and capabilities.
 - 3. Show dimensions and clearances required.
 - 4. Show wiring or piping diagrams and controls.
 - 5. Indicate finish.
- B. Manufacturer's Standard Schematic Drawings and Diagrams
 - 1. Modify drawings and diagrams to delete information that is not applicable to work.

2. Supplement standard information to furnish information specifically applicable work.

3.05 SAMPLES

- A. Submit full range of manufacturer's standard finishes except when more restrictive requirements are specified, indicating colors, textures, and patterns, for Architect selection.
- B. Submit samples to illustrate functional characteristics of products, including parts and attachments.
- C. Approved samples that may be used in the Work are indicated in the Specifications section.
- D. Label each sample with identification required for transmittal letter.
- E. Provide field samples of finishes at Project, at location acceptable to the Architect as required by individual Specifications section. Install each sample complete and finished. Acceptable finishes in place may be retained in completed work.

3.06 COORDINATION DRAWINGS

- A. Contractor shall be responsible for coordination of Work. Each civil, structural, mechanical, and electrical Subcontractor shall be responsible for coordination of their portion of Work with Contractor and with each affected trade.
- B. Contractor shall hold a coordination meeting with all trades attending to coordinate the work of the trades.
- C. As a result of the above meeting, Contractor shall prepare and submit to architect for his record, one set of coordination drawings reflecting coordination decisions made.
- D. Contractor shall coordinate with the architectural reflected ceiling plans the exact location and dimensioning of items which occur within hung ceiling. In the event of conflict, request a clarification from the Architect as to the correct locations of items in question.

3.07 CONTRACTOR'S REVIEW

- A. Review submittals prior to transmittal.
- B. Apply Contractor's stamp to submittals, initialed or signed by authorized person and dated, certifying to review of submittal verification of products, field measurements and field construction criteria, and coordination of information within submittal with requirements of work and of Contract Documents.
- C. Submittals without Contractor's stamp and submittals which, in Architect's or Owner's opinion are incomplete, contain numerous errors or have not been checked or have only been checked superficially, will be returned without disposition. Any resulting delays shall be Contractor's responsibility.
- D. Clearly note proposed deviations from Contract Documents or submittals.
- E. Contractor shall be responsible for quantities and dimensions shown on submittals.

3.08 SUBMISSION REQUIREMENTS

- A. Shop drawings, project data, and samples required by different sections of the specifications submitted to the Architect for review must be identified as separate submittals. Do not bundle, staple or otherwise attach in any manner that would prevent submittals from being reviewed separately from different specification sections even though they may have the same supplier or fabricator. Clearly identify items representing submission requirements from different section of the specifications on the associated transmittal or cover letter.
- B. Shop drawings and samples shall be identified by the project name and location, supplier's name and date. A letter of transmittal from the General Contractor, in duplicate, shall be submitted with the shop drawings.
- C. The Contractor shall allow approximately fourteen (14) calendar days for review, processing and return of shop drawing and/or submittals by Architect.
- D. The Contractor shall submit all samples and shop drawings three (3) weeks prior to his need their return after architectural review.
- E. Number of Copies of Submittals Required:
 - 1. Shop Drawings: The General Contractor shall submit copies Contractor requires for his own use plus three (3) copies (as required by Specification Section) for retention by Architect and Owner.
 - 2. Product Data and Samples: The General Contractor shall submit copies Contractor requires for his own use plus two (2) copies and samples of materials (as required by Specification Section) for retention by Architect and Owner.
 - 3. See Section 01700 – Contract Close-Out for additional copies of all submittals that may be required as part of the Contractor's Close-Out Submittals to Architect.
- F. Submittals or Accompanying Transmittal Letter shall contain the following:
 - 1. Date of submission and dates of previous submission when applicable
 - 2. Project Title and Number
 - 3. Contract Identification
 - 4. Names of Contractor, supplier and manufacturer.
 - 5. Identification of product with Specification Section number.
 - 6. Field dimensions, clearly identified as such.
 - 7. Relation to adjacent or critical features of work of materials.
 - 8. Applicable standards, such as ASTM or Federal Specifications numbers.
 - 9. Identification of revision on re-submittals.
 - 10. Additional information as required by Contract Documents.

11. Blank space for Contractor's and Architect's stamps.
 12. Contractor's review and affixed stamp.
- G. Clearly identify on submittals, or in writing at time of submission, deviations in submittals from requirements of Contract Documents.
 - H. Contractor's responsibility for deviations in submittals from requirements of Contract Documents is not relieved by Architect's review of submittals unless Architect gives written acceptance of specific deviation.

3.09 RESUBMISSION REQUIREMENTS

- A. Make corrections or changes in submittals required by Architect, and resubmit until accepted.
- B. Revise, initial drawings or data, and resubmit as specified on initial submittal. Indicate changes that have been made other than those requested by Architect.
- C. Make number of Submission and resubmit until accepted.
- D. Remove samples that are "rejected" or designated as "resubmit". Submit new samples as required for initial submittal.

3.10 ARCHITECT'S DUTIES

- A. Review of submittals with reasonable promptness and in accord with schedule for conformity to requirements of Contract Documents and to design Intent.
- B. Review of submittals is only for conformance with the design concept of the Project and compliance with the information given in the Contract Documents. Contractor is responsible for dimensions to be confirmed and correlated at the job site, information that pertains solely to the fabrication process or to techniques of construction and for coordination of the work of all trades. Approval shall not relieve Contractor of responsibility for any deviation from the requirements of the Contract Documents.
- C. Affix stamp and initials or signature and indicate requirements for re-submittal or acceptance of submittal.
- D. Return submittals to Contractor for distribution or for resubmission.

END OF SECTION



SECTION 01310

SCHEDULES, LOGS, PAYMENTS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Project Progress Schedule
- B. Procedure for receipt and processing of Applications for Payment.
- C. Submission of Partial and Full Releases of Liens.

1.02 PROJECT PROGRESS SCHEDULE

- A. Prior to the commencement of any Work, the Contractor shall prepare and submit a Project Progress Schedule to the Owner and Architect for approval.
- B. The Project Progress Schedule shall be based upon the number of days indicated in the Bid Form. Construction time shall commence with the issuance of the building permit, the Notice To Proceed and/or Notice of Commencement and shall cease upon the receipt of Certificate of Occupancy and issuance of Certificate of Substantial Completion.
- C. Copies of the Project Progress Schedule will be provided to Owner, Architect, Subcontractors, Owner's Consultants, etc. and all attendees at any Pre-Construction Conferences.
- D. No Applications for Payment will be approved by the Architect nor processed by the Owner for payment without the submission of an approved Project Progress Schedule (and other requirements listed below).
- F. The General Contractor shall base the Progress Schedule for the Project on the time schedule and sequence of availability of the equipment specified by the Owner.
- G. The time frames indicated for each item of work are to show the time permitted for actual fieldwork only. Materials submissions, shop drawings, etc., shall be submitted sufficiently in advance to allow processing time for the Owners review.
- H. The General Contractor shall schedule all operations in logical sequence to allow sufficient time in order to achieve completion at the times indicated.
- I. The completion times indicated for each item of work shall be construed to mean substantial completion, as defined in the General Conditions.
- J. Project Progress Schedule Format
 - 1. The Contractor shall prepare and maintain an overall project progress schedule in a Critical Path Method (CPM) chart fashion with an entry for every major trade and sub-trade, and further subdivided showing details and phases of work by each. See attached example.

2. The Chart shall clearly indicate and/or otherwise emphasize the "Critical Path" in an easy to read "graphical" manner that differentiates it from paths not deemed "critical".
 3. The chart shall indicate the date on which work will commence for every entry and shall indicate when such work will be complete - earliest and latest dates for each. It will also show the "duration" and "float times" (if any) of each entry.
 4. The Contractor shall also indicate the date on which the project will be substantially complete and the date of the final project completion.
- K. The chart shall be updated weekly and with the incorporation of approved Change Orders. Updated Project Progress Schedule shall be submitted with all "Application and Certifications of Payment".

1.03 APPLICATION AND CERTIFICATE FOR PAYMENT - PROGRESS PAYMENT

- A. Applications for Payment only include costs for labor, materials, products, work, services, etc. which have been provided, stored or installed. Permit fees, bonds, impact fees, or other administrative cost incurred by the project may be submitted for payment if a receipt of payment is provided.
- B. All "Applications for Payment" shall be submitted on the latest version of AIA Form G702.
- C. Four (4) fully executed copies of "Contractor's Application for Payment", Full or Partial Releases of Liens (See Requirements in Paragraph 1.06 below) from all Subcontractors, suppliers, etc. Full or Partial Releases of Liens (See Requirements in Paragraph 1.06 below) from the General Contractor, updated Schedule of Values, updated Project Progress Schedule, etc. shall be submitted to the Architect for review and processing.
- D. Stored Material (Article 9, Payments and Completion, Paragraph 9.3.2, of the General Conditions of the Contract for Construction AIA201 1997): Application and Certificates of Payment, which include cost for stored materials must be accompanied by the following:
 1. Stored Materials Onsite: Provide receipts, delivery tickets, or other written documentation of delivery. Also, provide photographs documenting evidence of stored materials and storage location.
 2. Stored Materials Offsite: Provide receipts, delivery tickets, or other written documentation of delivery to a "Bonded" warehouse or storage facility; Provide copies of warehouse or storage facility bonding; and provide photographs documenting evidence of stored materials and storage location.
- E. Deposits
 1. The Contractor may not draw on any "deposits" requested by Sub-Contractors or fabricators without prior approval from the Owner.

1.04 APPLICATION AND CERTIFICATE FOR PAYMENT - FINAL PAYMENT

- A. Final Payment and release of retainage will not be processed or made by Owner without the following documentation.

- B. Four (4) fully executed copies of "Contractor's Application for Payment", Full Releases of Liens from General Contractor, Subcontractors, Suppliers, etc. for all work for which Full Release of Liens has not previously been submitted, shall be submitted to the Architect for review and processing.
- C. On projects for which "Performance Bond and Labor and Materials Payment Bond" have been furnished, "Consent of Surety" must also be submitted at the completion of the project.
- D. See Section 9.10.2 of "A.I.A Document A201, General Conditions of the Contract for Construction" for additional documentation required for final payment and project closeout.
- E. See Section 01700 Contract Closeout of the Project Manual for additional documentation required for final payment and project closeout.

1.05 RELEASE OF LIENS

- A. All Releases of Lien are to be "Notarized".
- B. All Releases of Lien submitted with the Certificate and Application for Payments are to be "Originals". Photocopies or FAX copies are not acceptable.
- C. Releases of Lien provided by Subcontractors, suppliers, etc. are to be either for the exact amount of money received by each or are to identify the amount received for goods, services, material, work, etc. for a specific time period.
- D. Releases of Lien provided by the General Contractor are to be for the exact amount of money paid by the Owner to the General Contractor for the previous Certificate and Application for Payment (for Progress Payments) and for the total remaining amount due include all retainage for the final Certificate and Application for Payment.

END OF SECTION



SECTION 01400

QUALITY CONTROL

PART 1 - GENERAL

1.01 DESCRIPTION

- A. The Owner will retain the services of a testing laboratory and pay all costs to make tests and submit reports of tests to the Contractor. The Contractor shall schedule and arrange for the required testing directly with the testing laboratory. The Contractor shall cooperate by furnishing materials for testing and space for storage when necessary. Any testing or retesting required because of failure to meet specification requirements shall be paid by the Contractor and shall not be included in the Owner's expense.
- B. The Contractor shall pay for services of independent commercial testing laboratory to perform the following:
 - 1. Design preliminary mix proposed for use for Portland cement concrete and other material mixes which require control-testing laboratory.
 - 2. Tests required to establish optimum moisture of earth and base materials and to determine compactive effort to meet density requirements.
 - 3. Reinforcing steel.
 - 4. Precast concrete mix design.
 - 5. Additional samples and tests required for Contractor's convenience or when initial tests indicate work does not comply with Contract Documents.
- C. Required test are as stipulated under the several divisions of the technical specifications.
- D. Employment of testing laboratory shall in no way relieve Contractor of his obligation to perform Work in accordance with requirements of Contract Documents.

1.02 QUALITY ASSURANCE

- A. Comply with requirements of ASTM E 329 and E 3740.
- B. Laboratory shall maintain full-time registered engineer on staff to review services.
- C. Laboratory authorized to operate in the State of Florida
- D. Testing Equipment shall be calibrated at reasonable intervals with devices of accuracy traceable to either National Bureau of Standards or accepted values of natural physical constraints.

1.03 LABORATORY RESPONSIBILITIES

- A. Test samples of mixes submitted by Contractor.
- B. Cooperate with Architect and Contractor in performance of services. Furnish qualified personnel after due notice.

- C. Perform specified inspections, sampling, and testing of products in accordance with specified standards.
- D. Ascertain compliance of materials with requirements Contract Documents.
- E. Promptly notify Architect, Owner, and Contractor of observed irregularities or nonconformance of work or products.
- F. Perform additional inspections and tests as requested by the Owner or as required by the Architect.
- G. Attend preconstruction conferences and progress meetings if required.

1.04 LABORATORY REPORTS

- A. After each inspection and test, promptly submit six copies of laboratory reports as follows:

Owner:	One Copy
Architect	One Copy
Structural Engineer	One Copy
Contractor	Three Copies

- B. Each report shall include:

1. Date issued.
2. Project title and number.
3. Testing laboratory name, address and telephone number.
4. Name of laboratory inspector.
5. Date and time of sampling or inspection.
6. Identification of product and Specification section.
7. Location in Project.
8. Type of inspection or test.
9. Date of Test.
10. Results of Test.
11. Report unsatisfactory conditions or failure to comply with requirements of Contract Documents.
12. Record temperature and weather conditions.

- C. When requested by Architect, provide interpretation of test results.

1.05 LIMITS OF LABORATORY AUTHORITY

- A. Laboratory may not release, revoke, alter or enlarge on requirements of Contract Documents.

- B. Laboratory may not approve or accept any portion of Work.
- C. Laboratory may not assume any duties of Contractor.
- D. Laboratory has no authority to stop Work.

1.06 CONTRACTOR'S RESPONSIBILITY

- A. Deliver to laboratory at designated location adequate samples of materials proposed to be used that require testing, together with proposed mix design.
- B. Cooperate with laboratory personnel, and provide access to work and to manufacturer's facilities.
- C. Furnish incidental labor and facilities to provide access to Work to be tested, to obtain and handle samples at Project site or at source of product to be tested, to facilitate inspections and tests, and for storage and curing of test samples.
- D. Notify laboratory and Architect minimum of two days in advance of operations requiring inspection and testing services to allow for alignment of personnel and scheduling of tests.

END OF SECTION



SECTION 01402

STRUCTURAL STEEL QUALITY CONTROL

PART 1 - GENERAL

1.01 DESCRIPTION

- A. AISC Specifications - AISC Specifications for the Design Fabrication and Erection of Structural Steel Buildings - Current Edition (including Commentary and Supplements).
- B. AISC Code - AISC Code of Standard Practice for Steel Buildings and Bridges - Current Edition (including Commentary and Supplements).
- C. AISC Specifications for Structural Joints - AISC Specification for Structural Joints using ASTM A-325 or A-490 Bolts.
- D. AISC Standards - AISC Quality Criteria and Inspection Standards.
- E. AWS Code - AWS Structural Welding Code D1.1-79.
- F. ASTM Specifications - The latest appropriate specification of The American Society for Testing and Materials.

PART 2 - FIELD ERECTION INSPECTION

2.01 ALIGNMENT AND FIT-UP

- A. Verify the locations and setting of anchor bolts by witness of the Contractor's final check prior to setting of steel members.
- B. As the erection progresses, check connection of members for proper fit-up and adjustment prior to making permanent connections.
- C. Verify the plumbness of columns is within the allowable tolerance specified in AISC Specifications.
- D. Verify that any bracing and guying/cables, if required to secure the steel framing during erection, are installed in accordance with the erection procedures.
- E. During erection, verify the specified phases of construction and steel erection are complete in accordance with the erection procedure before proceeding with additional erection of structural steel.

2.01 INSPECTION OF WELDING WORK

- A. Visual inspection of welding work shall be performed as per AWS.

END OF SECTION



SECTION 01500

CONSTRUCTION FACILITIES & TEMPORARY CONTROLS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. The installation and use of temporary facilities by the General Contractor for the general construction progress of the Project are defined as follows:

1.02 WATER

- A. The Contractor will furnish water for construction of the Project. The Contractor shall also provide a safe sanitary means of furnishing drinking water to all personnel working on the Project.

1.03 ELECTRIC POWER AND SERVICE

- A. The Contractor shall provide temporary electrical power service from the source of supply, make temporary wiring and outlets of sufficient size and capacity as required for power tools and temporary lighting at all convenient points within the building.
- B. All wiring, switches, breakers, etc., shall meet the requirements of the National Electric Code and OSHA.
- C. A minimum light level of thirty (30) foot candles shall be maintained in all areas in which construction work is being performed, except where natural light exceed this requirement.
- D. It shall be the responsibility of the General Contractor and his Subcontractors to have the electrical systems in a state of completion sufficient for connection to permanent electrical service by the time the electricity is required for performing the testing of mechanical equipment.

1.04 TEMPORARY HEAT

- A. The Contractor shall provide heat as necessary to protect all work and materials against injury from dampness and cold and to dry out the building. All methods of heating shall be approved by the local authorities. All precautions shall be taken against possible spread of fire and damage to the building and/or equipment from smoke and soot.

1.05 TELEPHONE SERVICE

- A. The Contractor shall provide and maintain local telephone service for the legitimate use of those connected with the work, throughout the duration of the Project.
- B. The Contractor shall provide and maintain dedicated Facsimile (FAX) telephone service and on site Facsimile (FAX) machine for the legitimate use of those connected with the work, throughout the duration of the Project.

1.06 TOILET FACILITIES

- A. The Contractor shall provide and maintain in a sanitary condition at all times temporary facilities and enclosures on the premises at a location approved by the Architect for the

use of all workmen on the Project. Such facilities shall comply with the State Board of Health, OSHA and all local codes.

1.07 TEMPORARY EQUIPMENT

- A. The Contractor shall furnish and maintain equipment such as temporary stairs, ladders, ramps, runways, scaffolding, derricks, and chutes as required for proper execution of the work by all trades. When necessary, ladders shall be provided to safely enable access to all parts of work by the Architect, Owner or any other person authorized to inspect the work. Construction of such apparatus and equipment shall be in compliance with the city and county ordinances, OSHA and state laws.

1.08 PROTECTION OF PROJECT

- A. The Contractor shall erect and maintain such barricades, fences with light and other safety protective measures at all excavations, mounds of earth and other obstructions for the protection of the public and to protect all work as approved by the codes and the Architect.
- B. The Contractor and the Subcontractors are charged with the protection of the Work and the property, but the final responsibility for these provisions rest with the Contractor who shall take complete charge of the buildings and property from start to finish of the Work.

1.09 TREE & PLANT PROTECTION

- A. The Contractor shall provide & maintain protection of all existing trees & plants that will be retained on the site. Protection shall be fence work or posts installed to the spread of branches or shall be as required by local governmental ordinances. Any trees or plants that may be damaged or destroyed because of negligence or inadequate protection, shall be replaced by the Contractor at no charge to the Owner.

1.10 CONSTRUCTION OFFICE

- A. The Contractor shall erect and maintain for his & the Architect's use, in a location approved by the Owner, a temporary weathertight office furnished with a plan table, plan rack, means of storage and adequate seating.

1.11 ROADS AND ACCESS

- A. If the condition of the job site is such that temporary roads must be installed so that heavy equipment can be brought to and from the site satisfactorily, Contractor shall install such temporary roads and at the completion of the job, remove all materials involved therein and restore area utilized for such roads to previous finished state.

1.12 REMOVAL OF SERVICES

- A. At the completion of the work, all temporary facilities shall be removed and premises restored to an acceptable condition as directed by the Architect.

END OF SECTION

SECTION 01700

CONTRACT CLOSEOUT

1.01 SUBSTANTIAL COMPLETION

- A. When General Contractor considers Work is substantially complete, General Contractor shall submit to the Architect the following:
 - 1. Written notice that Work, or designated portion, is substantially complete.
 - 2. List of items to be completed or corrected.
 - 3. Copy of Certificate of Occupancy(s).
- B. The definition of "Substantial Completion" shall be as provided in Paragraph 9.8.1 of the A.I.A. General Conditions, Document A201, 1997, Edition
- C. Within reasonable time after receipt of such notice, Architect will make inspection to determine status of completion.
- D. Should Architect determine work is not substantially complete:
 - 1. Architect will promptly notify General Contractor, in writing, giving reasons.
 - 2. General Contractor shall remedy deficiencies in Work, and send second written notice of substantial completion to the Architect.
 - 3. Architect will re-inspect Work.
- D. When Architect concurs that Work is substantially complete, Architect will:
 - 1. Prepare Certificate of Substantial Completion on A.I.A. Form G704, accompanied by General Contractor's list of items to be completed or corrected, as verified and amended by Architect.

1.02 FINAL INSPECTION

- A. When General Contractor considers Work is complete, General 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 presence of Owner's representative and are operational.
 - 5. Work is completed and ready for final inspection.

- B. Architect will make inspection to verify status of completion with reasonable promptness after receipt of such certification.
- C. Should Architect consider that Work is incomplete or defective:
 - 1. Architect will promptly notify General Contractor in writing, listing incomplete or defective Work.
 - 2. General Contractor shall take immediate steps to remedy stated deficiencies and send second written certification to Architect that Work is complete.
 - 3. Architect will re-inspect Work.
- D. When Architect finds that Work is acceptable under the Contract Documents, Architect shall request General Contractor to make closeout submittals.

1.03 REINSPECTION FEES

- A. Should Architect perform re-inspections due to failure of work to comply with claims of status of completion make by General Contractor:
 - 1. General Contractor will compensate Architect for such additional services.
 - 2. Architect retains the right to withhold approval of final payment until such compensation is received.

1.04 CONTRACTOR'S CLOSEOUT SUBMITTALS TO ARCHITECT

- A. Evidence of compliance with requirements of governing authorities:
 - 1. Certificate of Occupancy
 - 2. Certificates of Inspection:
 - a. Mechanical
 - b. Electrical
- B. Final Documents - At the time of execution of Certificate of Substantial Completion the General Contractor shall submit to the Architect the following:
 - 1. All affidavits and notarized certificates regarding waivers of lien and wage rates, if applicable.
 - 2. Validated warranties and notarized copies of all guarantees for equipment and materials as required by the construction documents.
 - 3. Copy of all approved shop drawings or installation diagrams and three (3) copies of all brochures, manuals, etc., of all equipment as offered by the manufacturers.
 - 4. The General Contractor's one-year guarantee.
 - 5. List of Sub-contractors and major material suppliers, (shall include address, telephone number and name of individual to contact regarding this project).
 - 6. Record drawings of the completed project (on sepias supplied by Architect) on which the Contractor shall have recorded project changes. Included shall be the location by dimension from building walls of all buried construction, inside and

outside the building. In addition, the Contractor shall provide one (1) copy of such drawings in "blue-line" print set on which he shall have recorded, in colored pencils, all such changes. Included shall be the location by dimension from building walls of all buried construction, inside and outside the building.

- C. Close-Out Submittals per Paragraph 9.10.2 of the General Conditions of A201
 - 7. Consent of Surety
 - 8. Insurance Certificate
 - 9. Insurance Statement
- D. These items shall be packaged in a suitable metal file box, as approved by the Architect and shall be properly indexed. Individual submission of these items will not be accepted.

1.05 INSTRUCTION TO PERSONNEL

- A. General Contractor shall provide free instruction in the proper use of installed equipment to designated representatives of the Owner.
- B. Instruction of the Owner's maintenance supervisor in the proper methods of cleaning and maintaining all of the finished surfaces and the proper methods replacement of the consumable items such as filters, light bulbs, washers, etc., shall be a part of the Work.

1.06 GUARANTEE, TESTING AND MAINTENANCE

- A. The General Contractor guarantees that all materials used and workmanship performed in connection with this Contract, shall be free from defects for a period of one (1) year from date of execution of Certificate of Substantial Completion.
- B. The General Contractor shall start up, test, adjust, balance and otherwise place in a satisfactory working condition, all items of mechanical and electrical systems and shall fully instruct representatives of the Owner in the care and operation of such systems.
- C. General Contractor shall submit to the Architect, along with final requisition for payment, three (3) copies of a manual, assembled and bound, presenting for the Owner's guidance full details for care and maintenance of equipment included in the Contract.
- D. General Contractor shall, for this manual, obtain from Sub-contractors, literature of manufacturers relating to equipment, including motors. Also furnish cuts, wiring, diagrams, instruction sheets and other information pertaining to overall operation and maintenance.
- E. During a valid warranty period, if the General Contractor is unable or unwilling to respond immediately to make emergency repairs under conditions which the Owner may determine to be an emergency situation, the Owner reserves the right to make such emergency repairs and then to bill the General Contractor for a fair and reasonable amount in reimbursement for such repairs.

END OF SECTION



SECTION 01745

ROOF WARRANTY (SHINGLE ROOF)

PROJECT _____ OWNER _____

LOCATION _____ ARCHITECT _____

_____ (hereinafter referred to as the

Contractor) and _____ (hereinafter referred to as the Roofing Subcontractor) jointly and severally warrant to the Owner that all labor and materials are in accord with the Contract Documents, will be free of defects in materials and workmanship, and will remain in a watertight condition for a period of _____ years, beginning _____ (Date of Substantial Completion of the Project) and expiring _____ (Termination Date).

Items an approximate quantities of Work covered by this warranty are indicated below and indicated on attached roof plan.

_____ squares roofing manufactured by _____ to

specifications # _____, dated _____ and attached.

_____ linear feet of sheet metal flashing.

_____ (other)

WARRANTY CONDITIONS AND PROVISIONS

1. In executing this Warranty, Contractor and Roofing Subcontractor certifies that they have inspected surfaces to receive roofing Work and have found surfaces satisfactory for roofing application and in accord with Contract Documents.
2. In event of defects in workmanship resulting in blistering, splitting, and similar defects whether or not leaking results, Contractor and Roofing Subcontractor shall make repairs to remedy defects within 30 days after notification by Owner, unless otherwise agreed upon in writing.
3. In event of leaks in roof, Contractor and Roofing Subcontractor shall make repairs or modifications to the roof necessary to return roofing to watertight condition. Initiate such repair or modifications within 24 hours after notification by Owner, to be completed within 30 days unless otherwise agreed upon in writing.
4. Contractor and Roofing Subcontractor shall outline steps to be taken in writing, prior to making repairs or modifications to defective roofing.
5. Owner shall give notices of defects to Contractor and Roofing Subcontractor by registered U.S. Mail within 30 days of suspicion of defects.

6. Owner shall allow Contractor and Roofing Subcontractor free access to roof as required for inspecting and testing of suspected defects and for performing repairs.
7. Number and extent of repairs shall be unlimited during warranty period.
8. Four test cuts may be made during installation of roofing, as directed by Architect, to determine conformance with Contract Documents, without voiding this Warranty. Architect will notify Contractor and Roofing Subcontractor in writing of time when test cuts are to be made. Test cuts are not required for elastomeric sheet roofs unless specifically requested by manufacturer of sheet roof.
9. In event of an emergency which requires prompt repair in order to avoid substantial damage to building and contents, Owner may make temporary repairs as may be essential and such action shall not be a breach of this Warranty.
10. In event that Contractor's and Roofing Subcontractor's inspection reveals leaks or damages that are excluded under this Warranty, a maximum fee of \$100.00 may be charged. This fee shall be in addition to the charge for repair of excluded work.
11. Roofing Subcontractor shall, prior to expiration of this Warranty, upon notification by Owner, re-inspect roof with Owner's designated representative to determine whether defects exist. Repair defects encountered under the scope of this Warranty.

EXCLUSIONS

1. Damage caused by lightning, fire, earthquakes, windstorms in excess of 100 miles per hour as recorded by nearest National Weather Service, or similar unusual natural phenomena, wars, riots, or civil commotion.
2. Structural defects in building which result in cracks greater than 1/16" in width in roof decks or misapplication of roof deck materials.
3. Damage to roofing caused by abrasion or abuse, including installation of fixed or movable objects, without prior written approval of materials and methods by the Contractor or Roofing Subcontractor. Such approval shall not be unreasonably withheld.
4. Damage to roofing caused by actions of persons in the employ of the Owner, including but not limited to such tasks as cleaning roof drains, servicing equipment or cleaning windows.
5. Damage to roofing caused by the storing or discarding of materials on completed roof surface.
6. Damage to building or contents as a result of roofing leaks.
7. Repairs performed or repair materials furnished by other than the Contractor or Roofing Subcontractor.

This Warranty is in lieu of all other warranties and guarantees, express or implied, including warranties of merchantability and fitness and shall not be extended or altered, except by written instrument signed by Owner, Contractor and Roofing Subcontractor.

Signed at _____, this _____ day of _____ 19_____.

By: _____ By: _____

Title: _____ Title: _____

For: _____ For: _____

(General Contractor)

(Roofing Subcontractor)

Seal:

Seal:

Accepted By: _____

Title: _____

For: _____

(Owner)

Attachments: 1. Roof Plan

END OF SECTION



DIVISION 2 - SITEWORK

SECTION	02010	SUBSURFACE INVESTIGATION AND EXPLORATION	1 THRU 10
SECTION	02100	SITE PREPARATION	1 THRU 2
SECTION	02200	EARTHWORK	1 THRU 5
SECTION	02281	TERMITE CONTROL	1 THRU 3



SECTION 02010

SUBSURFACE INVESTIGATIONS AND EXPLORATION

PART 1 GENERAL

1.01 DESCRIPTION

- A. Boring and subsurface investigations of the project area have been made for use during the design of the project and to apprise the Contractor of subsurface conditions likely to be encountered. Copies of the borings and subsurface investigation are attached at the end of this section.
- B. Details pertaining to subsurface investigations are not guaranteed to be more than a general indication of the materials likely to be found adjacent to holes bored at the site of the work, approximately at the locations indicated. The Contractor shall examine the boring data and make his own interpretation of the subsoil investigation and other preliminary data.
- C. It is understood that such subsurface information was obtained and is intended for the design purposes and Contractor information. Recommendations for site preparation, groundwater control, compaction, or other subsurface conditions required for the proper construction of this project are to be followed unless indicated otherwise in subsequent specification sections or on the drawings. It is understood and agreed that each bidder is solely responsible for all assumptions, deductions or conclusions which he may make or obtain from his examination of the boring logs and other records or subsurface investigations and tests that are furnished.
- D. The Contractor is responsible for familiarizing himself with the existing on-site soil and groundwater conditions.

1.02 INTERPRETATION

- A. Soil investigation data is provided only for information and convenience of Bidders.
 - 1. Owner and Architect disclaim any responsibility for accuracy, true locations, and extent of soils investigation that has been prepared by others.
 - 2. Owner and Architect disclaim any responsibility for interpretations of data by Bidders, as in projecting soil bearing values, rock profiles, soil stability, and/or the presence, level, and extent of underground water.

END OF SECTION

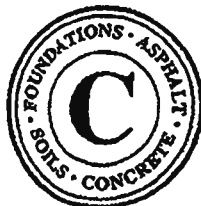


Apr 26 06 12:26p

Cal-Tech Testing

3867525456

p. 2



Cal-Tech Testing, Inc.

- Engineering
- Geotechnical
- Environmental

LABORATORIES

P.O. Box 1625 • Lake City, FL 32056-1625
6919 Distribution Avenue S., Unit #5 • Jacksonville, FL 32257

Tel. (386) 755-3633 • Fax (386) 752-5456
Tel. (904) 282-4046 • Fax (904) 282-4047

April 26, 2006

Peoples State Bank
350 S. W. Main Boulevard
Lake City, Florida 32025

Attention: Gil Miller

Reference: Proposed Peoples State Bank
U. S. 90 and C. R. 252B
Lake City, Florida
Cal-Tech Project No. 06-222

Dear Mr. Miller,

Cal-Tech Testing, Inc. has completed the subsurface investigation and engineering evaluation of the sites for a new bank building and storm water basins to be constructed near the intersection of U.S. 90 and C.R. 252B in Lake City, Florida. Our work was authorized by you.

Introduction

We understand you will construct a single-story, masonry and brick building with a plan area of about 3,200 square feet. Support for the building is to be provided by conventional, shallow spread footings. Floors are to be slab-on-grade. Anticipated foundation loads and proposed grading have not been provided; however, we assume column and wall loads will not exceed 40 kips and 3.0 kips per foot, respectively. Additionally, we assume the finished floor elevation will be no more than about 1.5 feet above the existing surface grade.

The site was previously developed, but it appears former structures have been removed. Some asphalt pavement and minor utilities remain. A significant quantity of underground utilities, primarily telephone, water and sewer are present within the northwest portion of the site. Except for utilities the building and basin sites appear currently to be open and grassy, and the ground surface is approximately level. Toward the south end of the site the ground surface appears to slope gently to the south.

The purposes of our investigation were to determine the general subsurface conditions in the proposed improvement areas and to provide recommendations for design and construction of the foundations and basins.

"Excellence in Engineering & Geoscience"

We were provided a site plan indicating the proposed improvement areas, and desired test boring locations were indicated on the plan.

Site Investigation

The subsurface conditions were investigated by performing three Standard Penetration Test borings advanced to depths of 15 feet and by performing two flight-auger or hand-auger borings advanced to depths of 10 and 15 feet. Borings were performed at the approximate locations indicated on the attached Boring Location Plan. These locations were selected by others but were staked by Cal-Tech Testing, Inc. using the plan provided.

The Standard Penetration Test (ASTM D-1586) is performed by driving a standard split-barrel sampler into the soil by blows of a 140-pound hammer falling 30 inches. The number of blows required to drive the sampler 1 foot, after seating 6 inches, is designated the penetration resistance, or N-value; this value is an index to soil density or consistency.

Flight-auger borings are performed by mechanically advancing a slender, solid-stem auger into the soil to the desired depth, by retracting the auger and by examining cuttings recovered on the auger flights. Samples are collected and are examined for soil type and color.

Hand-auger borings are performed by manually advancing a three-inch diameter, metal sleeve into the soil to recover samples from limited depths.

Findings

The soil borings generally encountered three soil strata. The first layer consists of about 2.5 feet of loose, tan, grayish tan or tannish gray sand with silt (SP/SM) or silty sand (SM). The N-values of this layer range from 4 to 7 blows per foot.

The second layer consists of 6.0 to 8.5 feet of loose to medium dense, light tan, light tan to white or white and orange sand (SP). The N-values of this layer range from 9 to 20 blows per foot.

The third layer consists of an undetermined thickness of medium dense, generally gray and orange or grayish brown, clayey sand (SC), sand with clay (SP/SC) or sand with traces of clay (SP).

Ground water was encountered at depths of 8.3 to 11.0 feet at the time of our investigation. We estimate the wet season water table will occur at a depth of about 8.0 feet below the existing surface grade.

For a more detailed description of the subsurface conditions encountered, please refer to the attached Boring Logs. Note specifically the transition between soil layers

Apr 26 06 12:26p

Cal-Tech Testing

3867525456

P. 4

may be gradual and not abrupt as indicated by the logs; therefore, the thickness of soil layers should be considered approximate.

Discussion and Recommendations

From the results of our investigation, it is our opinion the building can be supported by the proposed conventional, shallow spread footings. We recommend these foundations be sized to exert a maximum soil bearing pressure of 3,000 pounds per square foot. Additionally, we recommend the foundations have minimum widths of 18 and 30 inches at wall and column locations, respectively, and the bottoms of foundations should be embedded a minimum of 16 inches below the finished surface grade. The site soils appear to be loose to a depth of only about 4.0 feet; therefore, only normal, good practice site preparation procedures should be required to prepare the site. These procedures include stripping of the site, excavation to establish bearing grades and proof-rolling and proof-compaction of the bearing soils.

Existing utilities should be removed and/or relocated as required. The site should then be stripped of grass, roots, topsoil and other deleterious materials. Excavation should then be performed as required to establish the proposed foundation and floor bottom grades. Clean, sandy soil should be stockpiled for later use as fill.

The subgrade should then be thoroughly proof-rolled with heavy rubber-tired equipment (a large, loaded, front-end loader, for example). Proof rolling helps to compact the bearing soils and to locate zones of especially loose or soft soil that may be present. Such zones should be undercut and back-filled or otherwise treated as directed by the geotechnical engineer.

Following proof-rolling of the site, the subgrade should be proof-compacted to a minimum of 95% of the Modified Proctor maximum dry density to a depth of 2 feet in foundation areas and to a depth of 1 foot in floor slab areas.

Fill to raise the site can be placed as required following proof-rolling operations. Fill should consist of relatively clean, fine sand containing less than 10% passing the No. 200 sieve. Fill should be placed in maximum 12-inch, loose lifts, and each lift should be proof-compacted to a minimum of 95% of the Modified Proctor maximum dry density. Foundation cuts may be placed in the compacted fill. Disturbed fill or natural soils should be recompacted prior to placement of the foundations or slabs.

Field density testing should be performed in the compacted subgrade, in each lift of fill, and in foundation excavations to verify the recommended compaction has been achieved.

Based upon the USDA Soil Survey of Columbia County, the proposed basin sites are located within the Blanton Fine Sand soil group. For this soil group the water table is reported to occur at a depth of 5 to 6 feet most of the year. In wet seasons a perched water table is above the subsoil (the clayey sands) for less than one month. Confining

Apr 26 06 12:27p

Cal-Tech Testing

3867525456

p.5

soils were not encountered, and we believe the wet season water table will occur at a depth of about 6.0 feet.

Based upon our findings, we recommend you consider the following soil parameters for design of the basins:

1. Average depth of confining layer = N/A
2. Average Vertical Unsaturated Infiltration Rate = 19.0 feet/day
3. Average Horizontal Hydraulic Conductivity = 24.0 feet/day
4. Fillable Porosity = 30%
5. Average Depth of Seasonal High Water Table = 6.0 feet
6. Base elevation of effective aquifer = 15.0 feet below existing surface grade

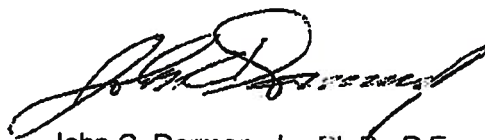
Our recommendations are based upon our findings as described in this report; however, subsurface conditions may exist that were not encountered in the soil test borings. Cal-Tech Testing, Inc. should be notified immediately if different soil conditions are encountered during construction. It may be necessary to reevaluate this site and revise our recommendations.

We appreciate the opportunity to be of service on this project and look forward to a continued association. Please do not hesitate to contact us should you have questions concerning this report or if we may be of further assistance.

Respectfully submitted,
Cal-Tech Testing, Inc.



Linda Creamer
President / C.E.O.



John C. Dorman, Jr., Ph.D., P.E.
Geotechnical Engineer

CC: Causseaux & Ellington, Inc.
6011 N. W. 1st Place
Gainesville, Florida 32607

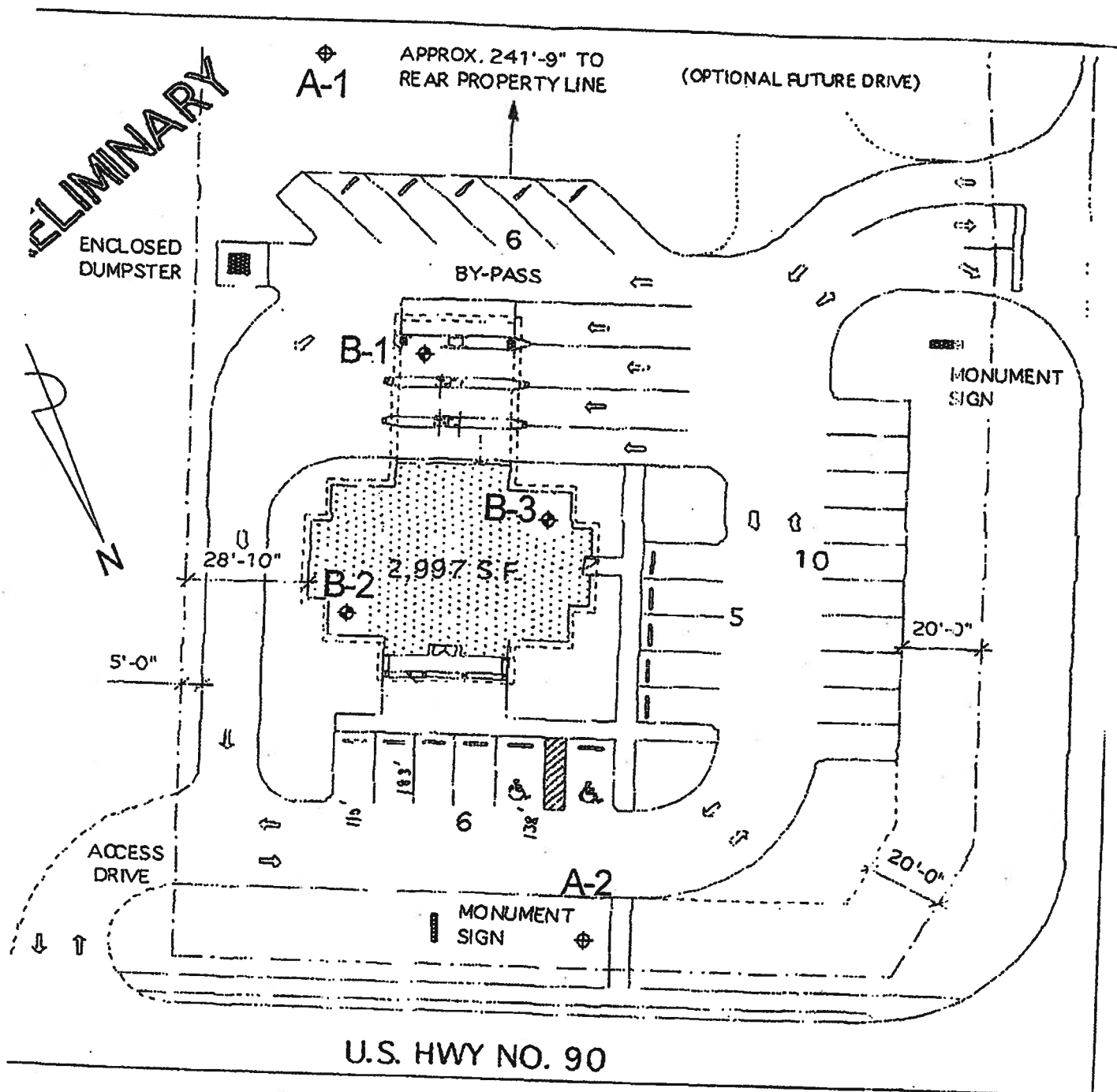
4/26/06
52612

Apr 26 06 12:27p

Cal-Tech Testing

3867525456

p.6

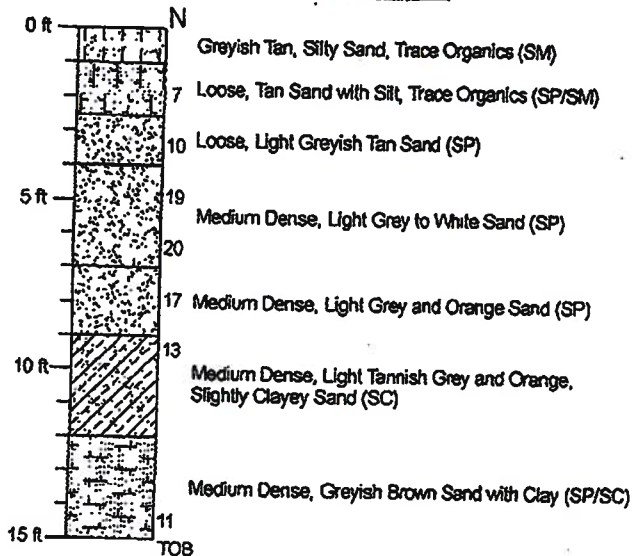


DRAWN BY S.C. Young		NAMES	DATE 4/13/06	ENGINEER OF RECORD CAL-TECH TESTING, INC.	SEAL	PROPOSED PEOPLES STATE	
CHECKED BY J.C. Dorman				P.O. BOX 1625 LAKE CITY, FL 32056	JOHN C. DORMAN, JR. P.E. 62812	ROAD NO.	COUNTY
CHECKED BY J.C. Dorman				PHONE NO. (386) 765-3833			
APPROVED BY J.C. Dorman				FAX NO. (386) 762-5456			FINANCIAL PROJECT
CAL-TECH JOB NO. 08-222						COLUMBIA	

B-1

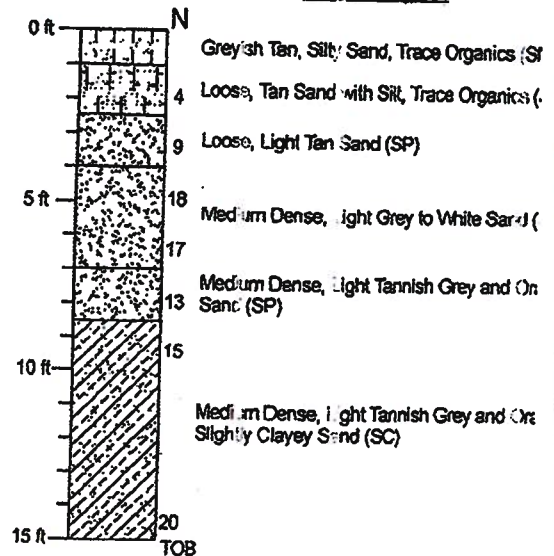
Water Table: 8.9 ft.

Depth (ft)

Soil Description**B-2**

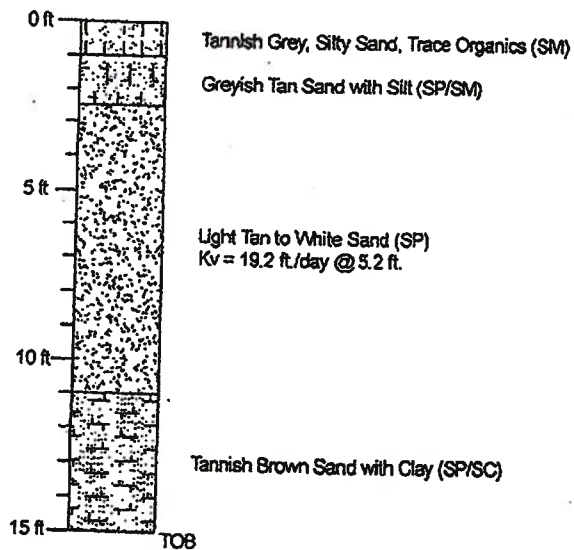
Water Table: 11.0 ft.

Depth (ft)

Soil Description**A-1**

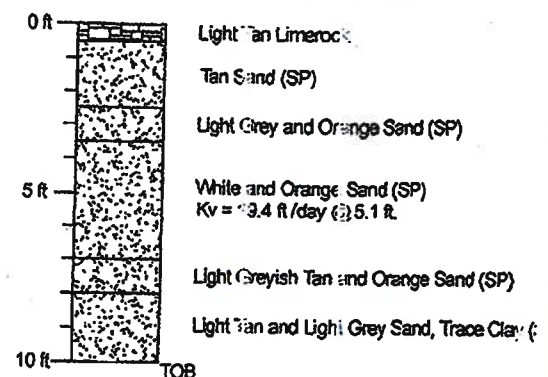
Water Table: 8.3 ft.

Depth (ft)

Soil Description**A-2**

Water Table: N/A

Depth (ft)

Soil Description**REVISIONS**

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DRAWN BY	NAMES	DATE
						S.C. Young		4/13/06
						J.C. Dorman		
						J.C. Dorman		
						J.C. Dorman		
						J.C. Dorman		
						J.C. Dorman		
						J.C. Dorman		
						J.C. Dorman		
						J.C. Dorman		
						J.C. Dorman		

ENGINEER OF RECORD

C/L- TECH TESTING,

P.O. BOX 1625
LAKE CITY, FL 32096
PHONE NO (386) 755-3632
FAX NO. (386) 752-5458

Apr 26 06 12:27p

Cal-Tech Testing

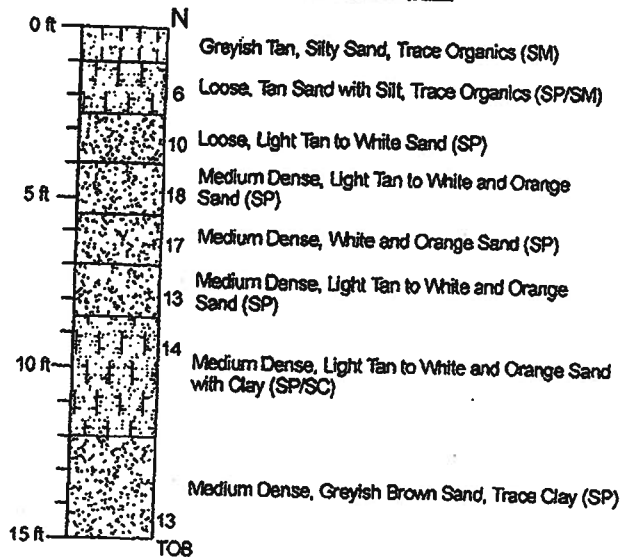
3867525456

p. 8

B-3

Water Table: 10.4 ft.

Depth (ft)

Soil DescriptionENGINEERING CLASSIFICATIONGRANULAR MATERIALS-

Relative Density	SPT (Blows/12 inches)
Very Loose	Less than 4
Loose	4-10
Medium Dense	11-30
Dense	31-50
Very Dense	Greater than 50

Very Loose	Less than 4
Loose	4-10
Medium Dense	11-30
Dense	31-50
Very Dense	Greater than 50

SILTS AND CLAYS-

Consistency	SPT (Blows/12 inches)
Very Soft	Less than 2
Soft	2-4
Medium Stiff	5-8
Stiff	9-15
Very Stiff	16-30
Hard	Greater than 30

Very Soft	Less than 2
Soft	2-4
Medium Stiff	5-8
Stiff	9-15
Very Stiff	16-30
Hard	Greater than 30

LEGEND

- TOB Termination of Boring
- GSE Ground Surface Elevation
- Y Ground Water at Time of Drilling
- Y Wet Season Water Table
- N Standard Penetration Resistance n Blows Per 12 inches (18-inch Spoon, ASTM D-1586)
- WOR Weight of Rod
- WOH Weight of Hammer
- MC Moisture Content (%)
- OC Organic Content (%)
- 200 Percent Passing No. 200 U.S. Standard Sieve
- LL Liquid Limit
- PI Plasticity Index
- (SP) Unified Soil Classification Based on Visual Observation and Laboratory Tests



SEAL

PROPOSED PEOPLES STATE BANK

JOHN C. DORMAN, JR.
PE 52612

ROAD NO. COUNTY FINANCIAL PROJECT I.D.

COLUMBIA

REPORT OF SOIL BORINGS

SHEET NO.

2 of 2



SECTION 02100

SITE PREPARTION

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Accept the premises as found. Clear and grub site as specified. Owner assumes no responsibility for conditions of site.
- B. Clearing and grubbing shall include the removal of all underbrush, the removing and wasting of organic materials from areas of construction, and the removal of all existing trees and shrubs except those marked or shown on drawings to remain.
- C. The setting and maintaining of erosion control materials shall be included in the work defined in this section.
- D. Related Work Specified Elsewhere:
 - 1. Construction Facilities and Temporary Controls: Section 01500
 - 2. Subsurface Investigation and Exploration: Section 02010
 - 3. Earthwork: Section 02200

1.02 AREAS OF CONSTRUCTION

- A. Building Areas: Defined as the areas under and within five (5) feet of all buildings as located and dimensioned on drawings.
- B. Retaining Walls: Defined as the areas under and extending two (2) feet beyond the spread of the footings under retaining walls as located and dimensioned on drawings.
- C. Paved Areas: Defined as areas under all new driveways and roadways, parking areas, patios, and sidewalks as located on site plan drawings.
- D. Areas of any pools, retention ponds and spillways as shown on site plan drawings, except as otherwise noted.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Hay bales shall be of standard size purchased for erosion control but shall have a minimum dimension of 18 inches which shall rest on the ground and which any waters will move laterally through them.
- B. Approved geotextile fabric may be used for erosion abatement and sediment transport, which meets the materials of Specification of Section 958 of the FDOT Standard Specification for Road and Bridge Construction.

PART 3 - EXECUTION

3.01 PERFORMANCE

- A. Prior to ANY work being performed on the site, the Contractor shall install erosion control/abatement materials in locations shown on the plans. When silt fences, silt screens, and/or hay bales have been set and securely staked, the contractor shall request that Architect or his designated representative review the installation. After satisfactory review, the Contractor may begin his other operation.
- B. Erosion abatement devices shall be properly maintained throughout the entire construction period. After construction has been substantially completed, the barriers may be removed. If hay bales have been used and areas of the site are pending the broadcasting of grass seed, the hay bales may be broken apart and use mixed with the seed for broadcasting/cutting into soil.
- C. Remove or fell trees in such a manner, cutting where necessary, that adjacent property and trees to remain will not be damaged.
- D. Cut off all underbrush down to grade. Under areas of trees to remain, exercise extreme caution not to scrap surface down below existing grade to a point of disturbing or damaging the surface root system of the tree.
- E. Under all areas of construction (within one foot of foundation), clear and grub all trees and shrubs (including the entire root system), remove all vegetation, stumps, dead roots, cardboard, trash and foreign material and the fill material shall be free of vegetation and foreign materials. The fill shall be compacted to assure adequate support of foundation.

No wood, vegetation, stumps, dead roots, cardboard, trash, or other cellulose-containing material shall be buried on the building lot within 15 feet of any building or the position of any building proposed to be built.
- F. After clearing and grubbing is complete, backfill all holes and craters left by tree removal. Utilize backfill techniques specified in Section 02200 to prevent undue settlement.
- G. Rubbish and debris shall be removed from the site.

END OF SECTION

SECTION 02200

EARTHWORK

PART 1 - GENERAL

1.01 DESCRIPTION

- A. The work required under this Section consists of furnishing all labor, materials, equipment, appliances, and services necessary in connection with excavation, filling, and backfilling, in accordance with the drawings and as specified herein. The work shall include, but not be limited to the following:
 - 1. Excavation, filling, and backfilling to five (5) feet outside building line
 - 2. Pumping and drainage for all work under this Section.
 - 3. Removal of all debris and of all unsuitable excavation materials.
 - 4. Tests.
- B. Rough grading and fine grading of sub-grade to finish grade, except where sod is installed. In areas where sod is installed, fine grade to 2" below finish grade.
- C. Maintaining all bench marks, monuments and other reference points and obtaining accurate replacement at final grade of any disturbed or destroyed items that must be moved due to nature of the work, and furnishing certification by a professional surveyor that all such items have been accurately relocated.
- E. Related Work Specified Elsewhere:
 - 1. Subsurface Investigation and Exploration: Section 02010
 - 2. Site Preparation: Section 02100
 - 3. Termite Control: Section 02281
 - 4. Cast In Place Concrete: Section 03300
 - 5. General Provisions, Mechanical: Section 15010
 - 6. General Provisions, Electrical: Section 16010

1.02 REQUIREMENTS OF REGULATORY AGENCIES

- A. Comply with federal, state, local and other duly constituted authorities in matters pertaining to:
 - 1. Permitting
 - 2. Disposal of and hauling of waste materials
 - 3. Safety precautions
 - 4. Barricades
 - 5. Protection of environmental matters

1.03 GENERAL

- A. Subsurface soil investigations have been made at this project site. Each bidding Contractor shall review the soils report provided in Section 02010 SUBSURFACE INVESTIGATION AND EXPLORATION. Bidders are expected to examine the site and subsurface investigations and familiarize themselves with the conditions to be encountered. The information contained in the soils report is the responsibility of the Soils Engineer and Contractor.

- B. Where recommendation presented in the soils report conflict with this section, the soils report shall govern.
- C. Boring data and information in connection with test borings are offered only as an aid, and no adjustments in the agreed upon Contract will be made if the furnished information is a variance with conditions encountered at the site.
- D. The Contractor shall examine all drawings and the specifications, shall have visited the site, consulted the records of adjacent construction and of existing utilities, and the connections, if any and noted all conditions and limitations that may influence the work required by this Section.
- E. Active utilities shall be adequately protected from damage and removed or relocated only as indicated or specified. The work shall be adequately protected, supported, or relocated as directed by the Architect.
- F. Inactive utilities shall be plugged or capped not less than 5'-0" outside the building lines.

1.04 EXISTING STRUCTURE

- A. Care shall be exercised during excavation, backfilling, and compaction work to avoid damage to existing buildings or foundations.

1.05 PROTECTION

- A. Protect trees
- B. Protect bench marks, existing structures, fences sidewalks, paving, and curbs from equipment and vehicular traffic.
- C. Protect above and below grade utilities which are to remain.
- D. Protect excavations by shoring, bracing, sheet piling, underpinning, or other methods required to prevent cave in or loose soil from falling into excavation.
- E. Notify Architect/Engineer of unexpected subsurface conditions and discontinue affected work in area until notified to resume work.
- F. Grade excavation top perimeter to prevent surface water run-off into excavation.
- G. Prevent ponding and washing of water on site and adjacent property.

1.06 QUALITY ASSURANCE

- A. Testing shall be done in accordance with Divisions Zero & One of these specifications.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Fill materials shall be approved and conform to the following except as specifically indicated otherwise on the drawings:
 - 1. Structural fill shall be a non-plastic, inorganic granular soil containing less than 10% material passing the #200 mesh sieve.

2. Fill, except as otherwise specified, shall be earth, free from debris, cinders, combustibles, roots, sod, wood, cellulose and organic materials.
3. All fill on ground not within the property limits of the project shall meet requirements of bodies having legal jurisdiction, such as Highway Departments of cities or states.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Work shall be completed prior to placing slabs or utilities in building areas.
- B. Work described herein shall be performed on the building areas and ten (10) feet outside.
- C. Excavations and forms shall be kept protected against damage or displacement and kept free of extraneous materials until pouring has been completed.
- D. Contractor shall excavate and backfill in accordance with instructions set for in the Subsurface Investigation. See Section 02010.
- E. Excavate to lines and elevations, as necessary for the proper construction of the work. Equipment and methods shall be suitable for the work at hand. Work shall conform to the following, unless indicated otherwise on the drawings and specified:
 1. Excavated material suitable for filling shall be separated from unsuitable material.
 2. Excavated material unsuitable for filling shall be removed from the site properly and disposed of.
- F. Dewatering
 1. Ground water shall be monitored prior to site preparation. When the water table is above or within the area of the bottom of the excavation, adequate dewatering is required. If the use of sump pumps results in inadequate dewatering, it is required that an adequate well point system be installed to assure that the hydraulic gradient is lowered to a minimum of 24" to 36" beneath the proposed excavation and that sufficient time is allowed for a properly sanded well point system to correctly dewater the soils.
 2. Once the dewatering system has been put into operation, dewatering shall be continuous until the excavation is backfilled two (2') feet above the normal watertable. The system shall be maintained by a qualified well point operator and shall be "tuned" at all times to maintain a high vacuum.
 3. It shall be the Contractor's responsibility to determine in advance if dewatering will be necessary and no additional compensation will be paid to the Contractor in the event dewatering is required.

3.02 INSTALLATION

- A. Fill, backfill, and compact fills as necessary to complete work with hand and/or suitable power equipment, in conformity with the following unless specifically indicated otherwise on the drawings:

1. Do not start work until fill material, fill areas, and equipment to be used in performing the work have been approved by the architect, all foreign materials have been removed and all new construction over which filling or backfilling is required has been completed and approved, such as utility items, etc.
2. Loosen existing soil for depth of 2" just before filling.
3. Surfaces of new subgrades shall be left clean.
4. Fill and compact approved materials on areas not within the property limits of the Project in manner to meet approval of bodies having legal jurisdiction.
5. Do not place in water or over debris, wood or foreign material unless specifically permitted by other notes or specifications.
6. Place all fills and backfills in layers not over 12" thick. Perform this work when soils' moisture will permit proper compaction or when the addition of water by spraying will approach optimum percentage of water.
7. Compact fills and backfills to the following maximum densities, expressed as percentages of maximum densities as determined by either ASTM D698, Method D, or AASHTO T-99, Method D:
 - a. The area should be backfilled with a structural fill material in a lift approximately twelve (12") inches in thickness and compacted by the use of vibratory drum roller having a static at-drum weight on the order of five (5) tons and a minimum impact force of 36000#. Compaction should continue until densities of at least 98% of the AASHTO T-180-74 (Modified Proctor) are obtained for a depth of 2 feet below compacted surface. Subsequent lifts of material placed to achieve the grade below the proposed floor slab should be placed in lifts on the order of twelve (12") inches in thickness and compacted by the use of the above vibratory equipment. Compaction should continue until densities of at least 95% of the Modified Maximum Dry Density (ASTM D 1557) is obtained within each foot of compacted fill material.
 - b. Fills and backfills within five (5) feet from outside walls, fills under sidewalks and fills not otherwise specified - 90% modified proctor.
 - c. The exposed undercut surface and each fill layer shall be compacted with a mechanical tamper to obtain the specified density.
8. Keep power driven, rider operated spreading, compacting and other heavy equipment away from walls at least a distance equal to the height of fill above footings.
9. Where fill is placed around or on two sides of any structure, carry it up evenly and avoid displacement or other damage to such structure.
10. All work shall be done in such a manner that damage to existing construction, particularly dampproofing or waterproofing and other protective covering, is avoided. Should damage, occur, stop work in the area, repair all damage and obtain Architect's approval to repairs before resuming work.

3.03 FIELD QUALITY CONTROL

- A. Testing of compaction as deemed necessary by the Architect, or his representative, will be performed by a testing laboratory selected by and paid for by the Owner. Where retesting is required as a result of test failure, cost of testing of re-compaction shall be done by the Contractor.
- B. The Contractor shall notify the Architect or his representative when in the Contractor's opinion each layer is ready for testing. It is the Contractor's responsibility to notify all parties concerned. Should the Contractor notify the testing lab of a given test and then cancel said test, the Contractor shall pay any cancellation fees due the testing lab.

END OF SECTION

SECTION 02281

TERMITE CONTROL

PART 1 - GENERAL

1.01 DESCRIPTION

- A. The compacted soil under all concrete floor slabs shall be chemically treated before vapor barrier is place.
- B. Treatment of all void or cavities in masonry or concrete construction below grade.
- C. Treatment of exterior perimeter of building.
- D. Related Work Specified Elsewhere:
 - 1. Earthwork: Section 02200
 - 2. Cast-In-Place Concrete: Section 03300
 - 3. Membrane Waterproofing: Section 07100

1.02 QUALITY ASSURANCE

- A. The applicator of the termite treatment shall be licensed and bonded in the state.
- B. The applicator shall comply with these specifications and manufacturer's instructions and recommendations for work, including preparation of substrate and application.
- C. The applicator shall use only termiticides that bear a federal registration number of the U.S. Environmental Protection Agency.
- D. Pre-Construction soil treatment shall be in accordance with the rules and laws of the Florida Department of Agriculture and Consumer Services.

1.03 GUARANTEE

- A. Upon completion and acceptance of the building by the Owner, the termite treatment applicator shall issue a written guarantee to the Owner stating the following provisions:
 - 1. That chemical having the required concentration and rate of application as herein specified have been applied.
 - 2. That the effectiveness of the soil treated will provide against infestation for a period of not less than five (5) years
 - a. That periodic inspections will be made during the five (5) year guarantee period and reports of such inspections promptly submitted to the Owner.
 - b. Upon notice by the Owner of infestation during the guarantee period, the Contractor shall provide promptly such treatment as may be necessary for the elimination and control of the termites, and shall replace all damage resulting therefrom to the original new condition at the Contractor's expense.

- c. The guarantee shall be covered by an unconditional repair bond in the amount of \$5,000.00 for each occurrence.
 - d. Owner shall have an option to renew surety bond for an additional ten (10) years on a yearly basis.
3. The guarantee shall be drawn in favor of the Owner successor or assignees.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. One of the following chemicals and concentration in water solution shall be used:
- | | |
|------------------------|--------|
| TERMIDOR (fipronil) | 0.125% |
| PREMISE (imidacloprid) | 0.10% |
- Proprietary materials, if:
- 1. They meet a five-year field test conducted by the U.S. Forest Service.
 - 2. They contain one or more of the above named chemicals in the concentrations given; and proof is provided that no toxic effects to humans or beneficial plant and animal life will result from their use.

PART 3 - EXECUTION

3.01 APPLICATION

- A. Initial chemical soil treatment inside the foundation perimeter shall be done after all excavation is complete.
- B. Soil area disturbed after initial chemical soil treatment shall be retreated with a chemical soil treatment including spaces boxed or formed.
- C. Space in concrete floors boxed out or formed for the subsequent installation of plumbing traps, drains, or any other purpose shall be created by using
- D. Apply one gallon per 10 sq. ft. as an over-all treatment under the slab; and, in addition, apply two (2) gallons every five (5) linear foot along both sides of foundation walls and around any openings in the interior of the slab cut or left for pipes, conduits or interior partitions. Also, treat voids of masonry foundation walls at the rate of two (2) gallons per five (5) linear feet.
- E. Treatment shall not be made when soil is excessively wet or immediately after heavy rains to avoid surface flow of the toxicant the application site. Unless the treated soil is to be promptly covered with stone fill and vapor barrier, adequate precautions must be taken to prevent disturbance of the treatment and human and animal contact with the treated soil. Application shall comply with all applicable state regulations.
- F. If rainfall occurs before vapor barrier placement, re-treatment is required. Any work, including placement of reinforcing steel, done after chemical treatment until the concrete floor is poured, shall be done in such a manner as to avoid penetrating or disturbing treated soil.

- G. If construction includes masonry veneers that extend below grade, a termite protective treatment must be applied to the cavity created between the veneer and the foundation, in lieu of a physical barrier.
- H. Chemical soil treatment shall be applied under all exterior concrete or grade within one foot of the primary structure sidewalls.
- I. Vertical chemical barrier shall be applied promptly after construction is completed including initial landscaping and irrigation/sprinkler installation. Any soil disturbed after the chemical barrier is applied shall be promptly retreated.

3.02 CERTIFICATION

- A. A Certificate of Compliance shall be issued to the Building Department by the licensed pest control company that contains the following statement:

"The building has received a complete treatment for the prevention of subterranean termites. Treatment is in accordance with the rules and laws established by the Florida Department of Agriculture and Consumer Services."

3.04 NOTICE OF TERMITE PROTECTION

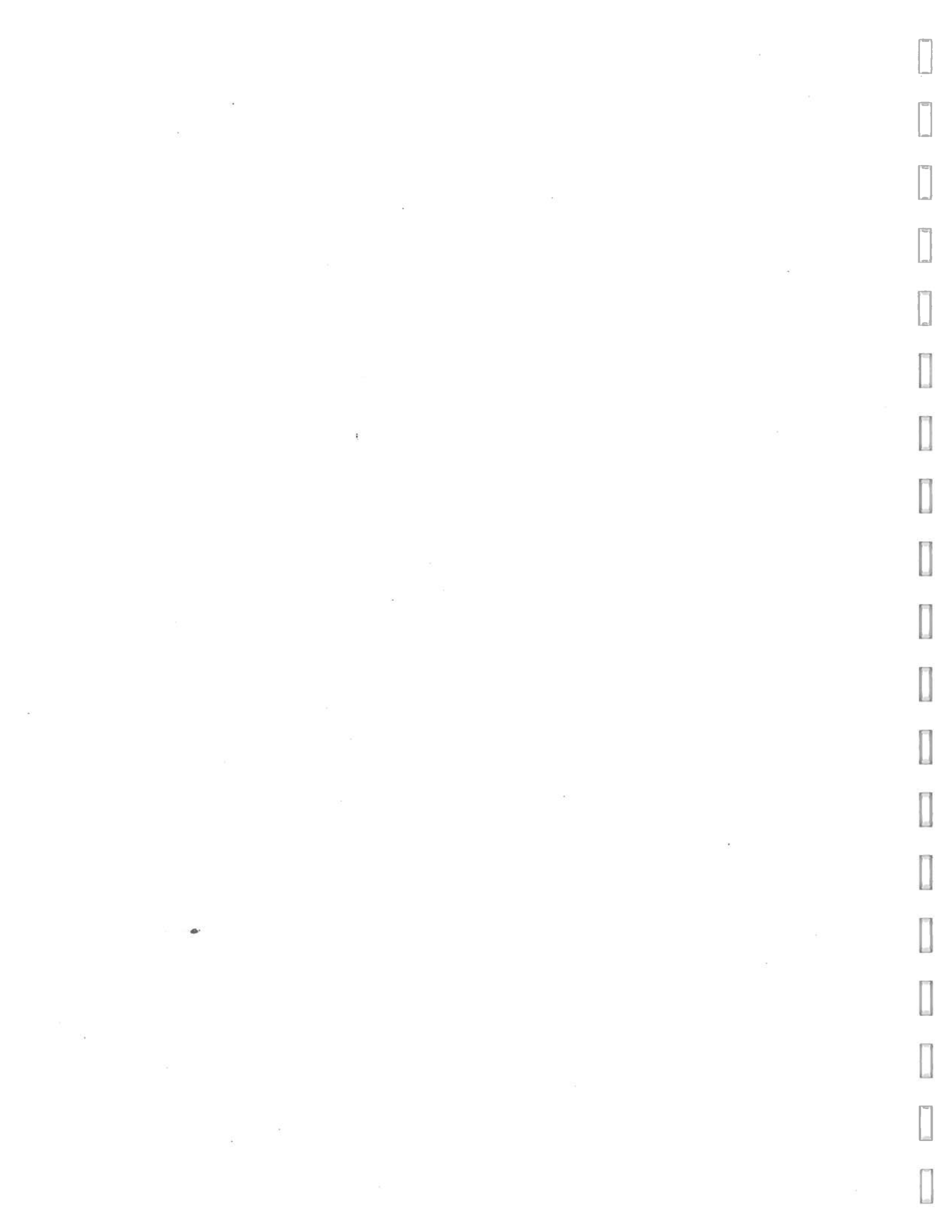
- A. A permanent sign which identifies the termite treatment provider and need for re-inspection and treatment contract renewal shall be provided. The sign shall be posted near the water heater or electrical panel

END OF SECTION



DIVISION 3 - CONCRETE

SECTION	03300	CAST-IN-PLACE CONCRETE	1 THRU 10
SECTION	03540	POLYMER GLAS FIBER REINFORCED CEMENT (GRC)	1 THRU 3
SECTION	03600	GROUT	1 THRU 1



SECTION 03300

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.01 DESCRIPTION

- A. All poured-in-place structural concrete including but not necessarily limited to concrete footings, foundations, slabs, floor toppings, etc.
- B. Reinforcing Steel and Accessories.
- C. Form Work
- D. Setting of all anchors, bolts, hangers and sleeves.
- E. Related Work Specified Elsewhere:
 - 1. Structural Excavation Backfill and Compaction: Section 02220
 - 2. Grout: Section 03600
 - 3. General Provisions, Mechanical: Section 15010
 - 4. General Provisions, Electrical: Section 16010

1.02 QUALITY ASSURANCE

- A. The American Concrete Institute Field Reference Manual, Publication SP-15, "Specifications for Structural Concrete for Buildings, ACI 301, with selected ACI and ASTM references," and ACT Standard 318, "Building Code Requirements for Reinforced Concrete" are hereby included and made a part of these specifications. A copy of these manuals shall be kept in the project field office at all times and made available to all personnel involved in supervising, inspecting or testing of concrete work.
- B. Supervisory personnel responsible for execution of concrete work shall make themselves thoroughly familiar with all requirements of the ACI field manuals and these specifications, and shall enforce all applicable regulations therein.

1.03 SUBMITTALS

- A. Submit sufficient shop drawing for reinforcing steel, formwork and concrete mixes to Architect for approval. Submit drawings in accordance with Section 01300. Obtain approval of drawings prior to fabrication of any material or proceeding with the Work. Shop drawings for reinforcing steel shall indicate bending diagrams; assembly diagrams, splicing and laps of bars, shapes, dimensions and details on bar reinforcing and accessories. Drawings shall be prepared in accordance with the "Manual of Standard Practice for Detailing Reinforced Concrete Structures", ACI-315. Scale dimensions from structural drawings shall not be used in determining the lengths of reinforcing rods. Complete placement plans and details shall be included.
- B. The Contractor is responsible for all dimension of the concrete work and shall check the structural drawings in relation to all other drawings and shall verify all dimensions in relation with other work at field conditions. Contractor is responsible for proper arrangement and fit of the work and if discrepancies are noted between the various drawings and work, the contractor shall notify the Architect immediately in writing and shall not proceed until so directed.

- C. The omission from shop drawings of any material shown on the original structural drawings or called for by these specifications shall not relieve the Contractor of the responsibility for furnishing and installing such materials, even though such shop drawings may have been returned as approved.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Portland Cement: ASTM C150, Type 1.
- B. Sand: Clean, hard and natural sand, or manufactured sand, or a combination of both and conforming to ASTM C 33. Sand with fineness modulus not less than 2.1 nor more than 2.50 PP Tannic Acid shall be used.
- C. Coarse aggregate shall be hard, durable, uncoated crushed stone or gravel conforming to ASTM C-33 and shall be non-reactive. Maximum size of aggregate shall not exceed 1/5 the narrowest dimension between side forms not 3/4 the minimum spacing between individual reinforcing bars.
- D. Water: Clean, fresh, potable, and free from injurious amounts of vegetable matter, alkalies and other impurities.
- E. Water Reducing Admixture: Conforming to ASTM C494, Type A such as WRDA, Pozzolith.
- F. Air Entraining Admixture: Conforming to ASTM C260, such as Darex or M.B.V.R.
- G. Reinforcement:
 - 1. Reinforcing Bars: Bars shall be deformed billet steel conforming to ASTM A615, Grade 60 as called for on the drawings. Reinforcement shall be clean and free from loose rust, scale or other coatings that will reduce bond.
 - 2. Fibrous Reinforcing: (ASTM C 1116 TYPE III, 4.1.3) Shall be collated Fibrillated polypropylene with a minimum density of 56 lbs./C.F., a tensile strength of 70,000 P.S.I. (min.) and non-absorbent. Fibrous reinforcing shall be added to concrete at the rate of 1.5 lbs. per cubic yard during mixing.
 - 3. Welded Wire Fabric Reinforcing: (ASTM A185) Steel wire spot welded at intersections and of size indicated. Where not noted, it shall be 6" X 6" mesh, No 10 gauge. Use wire reinforcing in all slabs on grade, including sidewalks, and elsewhere as indicated.
- H. Metal Accessories: Include all spacers, chairs, holsters, ties, and other devices necessary for properly placing, spacing, supporting and fastening reinforcing in place. Metal accessories shall have plastic tips where legs will be exposed in finished concrete surfaces. Accessories shall conform to requirements of Concrete Reinforcing Steel Institute (CRSI) "Manual of Standard Practice". Chairs and other accessories fabricated from concrete, ceramic or plastic may be used in place of metal accessories with approval of Architect.
- I. Metal Anchor Slots: Anchor Slots in concrete for securing masonry facing and masonry walls and partitions to concrete shall be proper type and size for anchors being used. Furnish with removable seals or packing.
- J. Expansion Joint Filler: Asphalt impregnated fiberboard conforming to ASTM D-1751 and extending full depth of slab or joint.

- K. Isolation Joint Fillers: Isolations joint fillers shall consist of 1/8" wide strips of Neoprene, synthetic rubber or 90 pounds roofing and extending full depth of slab.
- L. Crack Control Joints: "Form-A-Key Product Division" Key-Loc Joint control System as manufactured by Cardinal Manufacturing, Inc. P.O. Box 14144, 209 Eiler Ave., Louisville, KY 40212, (502) 361-1396.
- M. Curing Compounds: Thompson's Clearbond or Lambert #64 water seal curing compounds, (non-staining types).
- N. Concrete Sealer: Lambert Crystal Gard # 0800 (407) 841-2940.
- O. Vapor Barrier: Provide vapor barrier cover over prepared base material below slabs-on-grade. Use only materials resistant to deterioration when testing in accordance with ASTM E 154, as follows:
 - 1. Polyethylene sheet not less than 6 mils thick.

2.02 MIXES

- A. Prepare design mixes for each type and strength of concrete by either laboratory trial batch or field experience methods as specified in ACI 301. For the trial batch method, use an independent testing agency acceptable to Architect for preparing and reporting proposed mix designs.
 - 1. Do not use the same testing agency for field quality control testing.
- B. Submit written reports to Architect of each proposed mix for each class of concrete at least 15 days prior to start of Work. Do not begin concrete production until proposed mix designs have been reviewed by Architect.
- C. Design mixes to provide normal weight concrete with the following properties as indicated on drawings and schedules:
 - 1. Foundation, Slabs, Beams & Columns: 3000 PSI 28-day compressive strength, #57 coarse aggregate, 470 pounds cement minimum.
 - 2. 8" Tie Columns Tie Beams: 3000 PSI 28-day compressive strength, #89 coarse aggregate, 520 pounds cement.
 - 3. Filled Cell Mix: 3000 PSI 28-day compressive strength, #89 coarse aggregate, 565 pounds cement.
- D. Slump Limits: Proportion and design mixes to result in concrete slump at point of placement as follows:
 - 1. Ramps and sloping surfaces: Not more than 3 inches.
 - 2. Reinforced Foundation Systems: Not less than 3 inch and not more than 5 inches.
 - 3. Concrete containing high-range water-reducing admixture (superplasticizer): Not more than 8 inches after adding admixture to site verified 2-to-3 inch slump concrete.
 - 4. Slabs, Beams, & Columns: Not less than 4 inches nor more than 6 inches.

5. Tie Beams & Tie Columns: Not less than 5 inches nor more than 7 inches.
6. Filled Cells: Not less than 7 inches nor more than 9 inches.
- E. Adjustments to Concrete Mixes: Mix design adjustments may be requested by Contractor when characteristics of materials, job conditions, weather, test results, or other circumstances warrant, as accepted by Architect. Laboratory test data for revised mix design and strength results must be submitted to an accepted by Architect before using in Work.
- F. Admixtures
 1. Use Type "A" (normal) admixture for all structural concrete except when air temperature exceeds 85° F, use Type "D" (retarder) admixture.
 2. Type "E" (accelerator) admixture shall be used only when air temperature drops below 50° F., but shall not be used in prestressed concrete or concrete containing embedded items of aluminum or galvanized steel.
 3. For stone concrete exposed to the elements, an approved air entraining admixture shall be added to the concrete mix in the amount manner recommended by the manufacturer in order to obtain an air content of 5.0 percent, plus or minus 1.5% of the volume of the concrete for 1" maximum stone aggregate. Air entraining agent must be compatible with other additives. Do not pre-mix with other liquid admixtures. Add air entraining admixture to mix water, add other admixtures to the sand. Be sure each liquid admixture is added separately from separate dispensers.

PART 3 - EXECUTION

3.01 FORMS

- A. All forms shall conform to the lines, dimensions and shapes of the concrete as indicated on the drawings. They shall be watertight to prevent leakage of mortar and shall be smooth except where otherwise required, and free from defects where the concrete is to be left exposed. The forms shall be in such condition and have ample supports so that they will not bulge or get out of line or level as concrete is place. For exposed work, the maximum tolerance in line and level will be 1/16" at the joints. It will be the Concrete Contractor's responsibility to see that forms are supported well enough to insure the safety of workmen and the public, regardless of any review by Architect. Design of formwork shall comply with ACI 347.
- B. Camber bottom of slab and beam forms in approximately parabolic profiles at the rate of 1/4" for each of 10 feet of span. For cantilevered construction, the camber shall be a minimum of 1/2" of each 8 feet of span. Check camber and adjust forms, if necessary, before initial set takes place to maintain camber. Do not exceed maximum tolerances permitted in ACI 347.
- C. Corners of exposed beams, slabs, walls, etc. shall have 3/4" chamfer unless otherwise noted.
- D. The inside surface of wood board forms shall be soaked with clean water prior to placing concrete. Plywood shall be treated with an approved form oil or lacquer. If oil is used, all excess oil shall be wiped off with rages to leave the surface of the forms just oily to the touch. Where plaster bond finish is required, forms shall not be oiled after reinforcing is in place. Form oil on reinforcing will not be permitted.

- E. All keys shall be securely held in position by continuous wood blocking rigidly secured to forms of reinforcing.
- F. Re-usable forms shall be maintained properly by cleaning and repairing after each use as required, to insure satisfactory finished concrete work.
- G. Provide temporary clean out openings at the base of all forms and other points where necessary to facilitate cleaning and inspection for placing concrete. Each column shall include such an opening.
- H. Form ties used for exposed concrete surfaces shall be o type approved by Architect. They shall have a minimum working strength when fully assembled of at least 3000 lbs. Wire ties will not be permitted.
- I. Ties that are apt to be pulled from the walls, shall be coated with cup grease or other approved material to facilitate removal.
- J. Tie rods that are to be entirely removed from the walls shall be loosened 24 hours after the concrete is poured. All but a sufficient number of ties to hold the forms in place may be removed at that time.

3.02 PREPARATION

- A. General: Except as otherwise specified, concrete shall be ready mixed or job mixed the Contractor's option, in an approved type of power operated mixer that will insure a uniform distribution of the material throughout the mass, and in accordance with the requirements of the American Concrete Institute Building Code 318 and 304.
- B. Ready-Mix Concrete: Ready mixed concrete shall be mixed and delivered to the project in accordance with ASTM Specification C-94.
- C. No water shall be added to mixer after leaving ready mix plant without specific approval from Architect, Engineer or Inspector.
- D. Before placing concrete, all debris, water and ice shall be removed from the places to be occupied by the concrete. Wood forms shall be thoroughly wetted or oiled, and the reinforcement cleaned. Formwork and the placement of reinforcement, pipes, sleeves, conduit, hangers, anchors, and other inserts shall be inspected and approved by the Architect and the Building Department before any concrete is deposited.
- E. Screeds: All screeds shall be set with a level and not by measuring above preset forms. Check architectural drawings for areas to be recessed. All slabs to be drained shall slope to floor drains and set thickness shall be maintained. Set screeds at center of span of structural slabs and beams to provide camber top offset anticipated dead load deflection.

3.03 INSTALLATION

- A. Placing of reinforcement shall comply with the Concrete Reinforcing Steel Institute's Manual for Recommended Practice for Placing Reinforcing Bars, 2nd Edition, ACI Manual 301 and ACI Code Requirements 318.
- B. Vapor Barrier Installation
 - 1. Following leveling and tamping of sub-base for slabs-on grade, place vapor barrier sheeting with longest dimension parallel with direction of pour.

2. Lap joints 6 inches and seal vapor barrier joints with manufacturer's recommended mastic and pressure sensitive tape.
 3. Extend vapor barrier to face of vertical stemwall. Turn down and seal to face of stemwall.
 4. Seal all punctures and penetrations (i.e. plumbing, electrical, etc.).
- C. Place reinforcement accurately in position shown, securely fasten and support to prevent displacement before or during pouring. Bending, placing and splicing of reinforcement shall be in accordance with shop drawings. Mesh reinforcement in slabs shall have sides and ends lapped not less than one mesh.
- D. Provide for installation of inserts, conduit, pipe sleeves, drains, hangers, metal ties, shelf angle supports, anchors, bolts, angle guards, stair nosings, dowels, thimbles, anchor slots, metal reglets, nailing strips, blocking grounds and other fastening devices required for attachment of other work. Properly locate in cooperation with other trades and secure in position before concrete is poured. Where openings are left in concrete for the passage of ducts, the openings shall be made slightly larger than the duct size. Where boxes are required for floor type closers, they shall be accurately located. Do not install sleeves in any concrete beams, joist or columns except after approval of Architect.
- E. Anchor slots in concrete for securing masonry facing and masonry walls and partitions to concrete shall be provided and installed under this section. Seal face of slot with tape or pack with felt strips to prevent entrance of cement or grout. Set anchor slots straight at proper location and securely fasten to forms to prevent displacement while concrete is being poured. The anchors for inserting in slots are included under other sections.
- F. Metal flashing reglets set in concrete forms to receive metal flashing shall be provided by Roofing and Sheet Metal Contractor and set by General Contractor.
- G. All sleeves, chases, inserts, hangers, etc., which are provided and placed in the forms by the various trades, shall be maintained in position and protected until the concrete is completed. (Hangers where required, shall be anchored to the main reinforcing bars).
- H. Expansion Joint Filler: Install expansion joint filler at all locations (except where noted otherwise) where concrete slab meets vertical surfaces (i.e. masonry walls, concrete columns, metal columns, etc.). Expansion joint filler to be installed so top is flush with adjacent concrete slab.
- I. Concrete shall be rapidly handled from mixer to forms and deposited as nearly as possible in its final position to avoid segregation due to rehandling or flowing. Placement of concrete shall follow ACI 301 and ACI 304 recommendations.
- J. Truck mixing shall be delayed until only time remains to accomplish mixing placing. During extremely hot weather, avoid unnecessary exposure of mixers to sun while waiting. Dispatching of trucks and organization of use of concrete shall be coordinated to avoid unnecessary mixing of concrete. Provide sufficient personnel to handle work properly to avoid temptation to add water for handling. Maximum time from introduction of mixing water to discharge shall not exceed 90 minutes; reject all concrete in truck over 90 minutes.
- K. No concrete that has partially hardened or been contaminated by foreign material shall be deposited in the work.
- L. All concrete shall be placed upon clean, well-thawed, damp surfaces, free from water.

- M. Concrete shall not be allowed to drop freely more than three (3) feet. Where greater drops are required, a tremie or other method approved by the Architect shall be employed.
- N. Concrete shall be mixed and placed only when the temperature is at least 40° F and rising. Refer to ACI 305 and ACI 306, respectively, for additional recommendations for hot and cold weather concreting.
- O. Minimum practicable slump shall be used for all reinforced concrete work. Water/cement ratio shall not be altered from design standards under any circumstances unless specifically approved by the Architect.
- P. Concrete Sealer: Apply two coats of "Lambert" Crystal Gard #0800 to concrete all interior concrete slabs and to 6" concrete slab at Drive-In apron. Apply in accordance with manufacturer's specifications.
- Q. Install expansion joint material at junction of slab (on grade) and all vertical surfaces. Expansion joint to be the height of the adjacent slab.
- R. Filled cells at masonry units to be vibrated during placement using a "pencil" type vibrator. All filled cells shall be poured at least two (2) hours prior to pouring beams and lintels.

3.04 FIELD QUALITY CONTROL

- A. Testing laboratory shall be notified by the Contractor when concrete is being placed and field-testing and test cylinders are being obtained. Only qualified personnel of the testing laboratory shall make all required field tests.
- B. Make tests as hereinafter listed for each 50 cubic yards of fresh concrete or fraction thereof in the Project, but not less than one set for each day's concreting. Properly make and identify each test cylinder, store and protect until they can be delivered to the testing laboratory, and keep an adequate log record of all cylinders and other tests made, including areas and locations where concrete was placed for which test or samples were taken.
- C. Compression and Strength Test: Each test shall consist of four standard 6" X 12" cylinders; one cylinder to be tested at the age of seven (7) days and two (2) cylinders at the age of twenty-eight (28) days. The fourth cylinder shall be retained for further testing, if necessary. Samples from which compression test specimens are molded shall be secured in accordance with ASTM C172. Strength tests shall be made in accordance with ASTM C39.
- D. Slump Tests: Tests for slump shall be made at the place of deposit and in accordance with ASTM C143. Tests shall be made on each truckload of concrete delivered before any concrete is discharged into the forms. Concrete with slump over Five (5) inches shall be rejected and not placed. Water may be added at the rate of one gallon per yard to increase the slump by one (1) inch to improve work ability where desired, up to a maximum slump of five (5) inches. Inspector approval is required.
- E. Enforcement of Strength Requirements:
 - 1. Acceptability of concrete shall be in accordance with ACI 318. When the ultimate compressive strength of any cylinder falls below the specified strength for the class of concrete specified, the design mix and water content shall be adjusted to produce the specified strength for concrete that is

subsequently placed. In addition, the Architect may order additional curing form the portion of the structure where questionable concrete has been placed. In the event that such additional curing does not give the strength required, as determined by load tests made in accordance with ACI 318, or cored cylinder tests, if such tests indicate the necessity, the defective parts shall be removed and replaced or shall be reinforced as directed by the Architect, at the Contractor's expense, including the expense of the tests.

2. Four (4) copies of laboratory test reports shall be sent directly to the Architect, and two (2) to the General Contractor by the laboratory.

3.05 FINISHES OTHER THAN FLOORS

- A. All exposed interior and exterior walls, curbs, ceilings and other concrete surfaces except as otherwise specified or called for in the Finish Schedule shall, after removal of forms, have all fins and form marks removed by grinding, voids and honeycombs filled and shall be rubbed with carbonundum as required where a smooth finish is indicated.
- B. In all foundation walls below grade and pit walls on backfill side as well as expose side, the ties and spreaders shall be cut back to a depth of approximately 1-1/2". Any honeycombed concrete or voids shall be cut back to sound concrete. All cuts shall to a depth of at least 1-1/2" with the edges perpendicular to the surface.
- C. Concrete surfaces not exposed to view may be left as they come from the forms. All holes resulting from cutting back for scale pockets, honeycomb, surface voids and the removal of form wires or spreaders shall, however, be filled with cement mortar.
- D. Patching:
 1. Any concrete which is not formed as shown on the drawings or for any reason is not of alignment or levels or shows a defective surface shall be considered as not conforming with the intent of these specifications and shall be removed from the job by the Contractor at his expense unless the Architect grants permission to patch the defective area. Permission to patch any such area shall not be considered a waiver of the Architect's right to require complete removal of the defective work if the patching does not, in his opinion, satisfactorily restore the quality and appearance of the surface.
- E. Plaster Bond Finish: Plaster bond finish shall be used for all concrete surfaces that are to receive mortar, plaster or stucco applied directly thereto after forms are removed. Clean concrete surfaces of oil, grease, dirt and loose particles. Application of bond coats shall be included under another section of these specifications. A chemical bonding agent shall be used on all concrete receiving a bonded finish.

3.06 FLOOR AND SLAB FINISHES

- A. General
 1. The finish of all floors and slabs shall be indicated on the drawings or as herein stipulated or as is obviously suitable for the specific floor or slab. Hereinafter listed are descriptions of common type of finish. Finished concrete slabs shall be worked so that large aggregate will no be visible in the top surface.
 2. All floors must be protected during construction to prevent marring and defacements.

3. Where allowable tolerances in surface elevation of slabs are exceeded, the Architect may direct the Contractor to grind or patch the floor to bring the surface within requirements. Grinding shall be done as soon as possible but not before three (3) days of cure.

B. Finishes

1. Scratched finish for surfaces intended to receive applied cementitious finishes. After the concrete has been struck off, consolidated and leveled, the surface shall be roughened with stiff brushes or rakes before final set.
2. Floated finish for surfaces intended to receive proper floor hardener by Master Builders. Treatment applied to floor and joints to protect against heavy forklift traffic and spalling joints, i.e." Master plate 200" or equal. After the concrete has been placed, struck off, consolidated and leveled, the concrete shall not be worked further until ready for floating. Floating shall begin when the water sheen has disappeared and/or when the mix has stiffened sufficiently to permit the proper operation of a power-driven float. The surface shall then be consolidated with power-driven floats of the impact type except in these sections such as pan slabs. Hand floating with wood or cork-faced floats shall be used in locations inaccessible to the power-driven machine. Trueness of surface shall be rechecked at this stage with a 10-foot straightedge applied at not less than two different angles. All high spots shall be cut down and all low spots filled during this procedure to produce planes checking true under the straightedge in any direction with tolerances no exceeding 1/8" in 10'. The slab shall then be re-floated immediately to a uniform smooth, granular texture.
3. Troweled finish for surfaces intended for walking or for reception of floorcovering. The surface shall be finished first with impact power floats as specified above where applicable, then with power trowels and finally with hand trowels. The first troweling after power floating shall be done by a power trowel and shall produce a smooth surface that may still contain some trowel marks. Additional troweling shall be done by hand after the surface has hardened sufficiently. The final troweling shall be done when a ringing sound is produced as the trowel is move over the surface. The surface shall be thoroughly consolidated by the hand trowel operation. The finished surface shall be free of any trowel markings and shall be uniform in texture and appearance. On surfaces intended to receive floor covering, any of sufficient magnitude to show through the floor covering shall be removed by grinding.
4. Broom or belt finish: equipment slabs in other locations so specified, shall be given a coarse transverse scored texture by drawing a broom or burlap belt across the surface. This operation shall follow immediately after floating. Floating shall be performed as outlined above.
5. Tooled Details: Where noted on drawings, concrete paving pattern to be achieved through use of 2" wide edge tool.
6. Sidewalks Joint Pattern: Sidewalk slabs adjacent to the building to have tooling or joint pattern as indicated on the floor plans. General sidewalk pattern at all other locations not specifically indicated on the drawings to be the follows:

Tooled joints at 5'-0" on center
Expansion joints at 10'-0" on center.

3.07 CURING AND PROTECTION

A. Curing:

1. The top surface of all slabs shall be sprayed with an approved liquid membrane-forming compound in accordance with the directions of the manufacturer as soon as the newly placed surface has been finished and will not be marred by applications.
2. The liquid membrane-forming compound shall meet the requirements of "Specifications for Liquid Membrane-Forming Compounds for Curing Concrete" (ASTM C-309), and shall contain a fugitive dye.
3. The contractor shall submit to the Architect test reports from an independent testing laboratory or other acceptable data, including a manufacturer's guarantee, proving compatibility with all types of resilient floor adhesives as well as separate cement and terrazzo toppings.
4. Surfaces subject to heavy rainfall within three (3) hours of compound applications shall be re-sprayed.
5. Where practicable, forms shall be kept in place for a 7-day curing period. The top exposed concrete surface shall be kept wet and the wood forms shall be kept moist. In order that the curing water may reach the surfaces of walls, beams and columns, the forms shall be loosened to allow water to be poured over the top and thus down between the concrete and the forms.
6. If not practicable to keep forms on for seven (7) days, cover concrete with fabrics that have moisture-retaining properties. Such materials shall be examined carefully to detect elements that might discolor the finish. Such covers also shall be kept continuously moist to insure a film of water on the surface.

3.08 SAWCUT JOINTS

- #### A.
- Where sawcut joints are noted on plans, joints are to be cut as soon as concrete sufficient cured to be able to sustain the weight and activity involved in sawcutting process. Sawcutting must occur within eight (8) hours of placement of concrete.

END OF SECTION

SECTION 03540

POLYMER GLASS FIBER REINFORCED CEMENT (GRC)

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Furnish all materials, labor, equipment, and services for the supply and installation of polymer glass fiber reinforced cement (GRC) columns as indicated on the drawings and contract document, all in compliance with local codes and/or ordinances.
- B. Work shall include supply and installation.
- C. Related Work Specified Elsewhere:
 - 1. Sealants: Section 07900
 - 2. Gypsum Wallboard Systems: Section 09260
 - 3. Paint: Section 09900

1.02 RESPONSIBILITY

- A. The Gypsum Board or Carpentry Contractor shall install the work under this section and will be responsible for coordinating the installation with other trades.

1.03 SUBMITTALS

- A. Submit samples of all materials and product data to Architect for approval in accord with Section 01300.
- B. Submit shop drawings for approval showing plans, sections, details, joint treatment, reinforcing, fastening devices and the relations of GRC components to surrounding construction.

1.04 MOCK-UP

- A. Prior to production, erect one prototype on-site for review by the Architect. Once approved, this prototype will establish standards by which the work shall be judged.

1.05 DELIVERY, STORAGE, HANDLING, AND PROTECTION

- A. Transport and handle units in a manner that avoids excessive stresses or damage.
- B. Components displaying obvious damage must be rejected at site at time of delivery.
- C. Store the components in controlled environment, weather protected, on level surfaces with temporary supports as required. Do not stack or lean.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. GRC products as manufactured by - PlasterForm Ltd., 936 St. George Barber Road, Davidsonville, Maryland 21035, (800) 268-4534.
- B. Component shall be suitably reinforced with steel and wood.
- C. Fabrication will be as per approved shop drawings and will not include assembly. If multiple components are required to complete design criteria as per contract documents, additional site work under related section, installation, or finishing may be required.

2.02 TOLERANCES (FABRICATION)

A. Dimensional - all dimensions	+/-1/8"
Thickness - skin	+/-1/16"
Thickness - total unit	+/-1/4"-3/8"
Warpage or Bowing	+/-1/16"/foot
Out of Plane - unit to unit	+/-1/8"

Site conditions and normal manufacturing variations may require additional site work to maintain tolerances.

2.03 PHYSICAL PROPERTIES

A. Shell Thickness	1/4"-3/8"
Weight (depending on reinforcing)	2 1/2 - 4 lbs/sq. ft.
Density	130 -140 lbs./cu. ft.
Tensile Strength	1,200 - 1,350 p.s.i.
Compressive Strength	7,900 - 8100 p.s.i.
Modulus of Elasticity	5.75 X 10 ⁵ p.s.i.
Impact Strength	9.95 ft-lbs./sq.in.
Fiber Content	5% - 6% by weight
B. <u>Columns to be two(2) piece constructions at all locations where they enclose structural columns. All other locations may be either one or two piece.</u>	

2.04 COLUMN TYPE AND SIZE

- A. Column Shaft - 15" diameter
- B. Column Height - 10'-0" +/- 1/2" (rough opening)
- C. Column Type: Tapered Shaft.

PART 3 - EXECUTION

3.01 PRE-INSTALLATION RESPONSIBILITY

- A. Field Measurements: Prior to manufacturing, the installer will be responsible for obtaining all field dimensions for inclusion on the manufacturers shop drawings.
- B. Coordination: The Installer will be responsible for the coordination of the installation with related sections, within the tolerances specified in the respective articles.

- C. Discrepancies: Prior to installation, the installer shall check job site dimensions and conditions. Any discrepancies between design and field dimensions shall be brought to the attention of the General Contractor and Architect.

3.02 INSTALLATION

- A. Components shall be lifted with suitable devices
- B. Components shall be installed plum and true. Shim as required.
- C. Fasten components using galvanized screws only through face or back as indicated on the shop drawings.
- D. Where components are suspended, use a minimum of 12 gauge galvanized steel wire and the suspension points indicated on the shop drawings.
- E. Framing, hangers, etc. as specified for Gypsum Board Construction.
- F. Butt joints are to be caulked with sealant approved by manufacturer.
- G. Introduce control joints as required and as specified under related sections of the specifications.
- H. Patch countersunk fasteners and any damage to match component texture using materials furnished by the manufacturer.

3.03 FINISHING

- A. The Paint Contractor shall comply with the Painting section of the specifications for exterior concrete. Using only high-grade exterior breathable primer and paint.

END OF SECTION



SECTION 03600

GROUT

PART 1 - GENERAL

1.01 DESCRIPTION

- A. All Grouts and Anchoring Cements.
- B. Related Work Specified Elsewhere:
 - 1. Cast-In-Place Concrete: Section 03300
 - 2. Unit Masonry: Section 04200
 - 3. Structural Steel: Section 05120
 - 4. General Provisions, Mechanical: Section 15010
 - 5. General Provisions, Electrical: Section 16010

1.02 QUALITY ASSURANCE

- A. ASTM C109, C191 and C827.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Non-shrink grout - Vibropruf #11 by Lambert Corporation, 20 N. Coburn, Orlando, FL 32805, Tel: (800) 432-4746 or approved equal.
- B. Anchoring Cement - Por-Rok by Por-Rok Construction Products, 16 Cherry Street, Clifton, NJ 07014, Tel: 973-777-2307 or approved equal.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Mix and install in accordance with manufacturer's printed instructions.

END OF SECTION



DIVISION 4 - MASONRY

SECTION	04100	MORTAR	1 THRU 3
SECTION	04200	UNIT MASONRY	1 THRU 3



SECTION 04100

MORTAR

PART 1 - GENERAL

1.01 DESCRIPTION

- A. All Masonry Mortars.
- B. Related Work Specified Elsewhere:
 - 1. Cast-In-Place Concrete: Section 03300
 - 2. Masonry: Section 04200
 - 3. Structural Steel: Section 05120
 - 4. Flashing and Sheet Metal: Section 07600
 - 6. Metal Doors and Frames: Section 08110

1.02 QUALITY ASSURANCE

- A. Materials shall conform to the requirements of the American Society for Testing and Materials and Portland Cement Association specifications listed, and these specifications, unless specifically indicated otherwise on the drawings.
- B. All mortar and masonry units of all types shall be free of materials of any kind which will cause stains, popping or any other detrimental occurrence when installed in locations required by the drawings. Ferrous materials, except in approved forms shall not be present in a form that can cause stains.
- C. Use only one brand of cement for each type specified throughout Project.
- D. Provide sand for brick masonry Work from single source and pit, consistent in color.

1.03 SUBMITTALS

- A. Submit samples of all colored mortar in accordance with Section 01300.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Portland Cement
 - 1. Type: Meet ASTM C150-76, Types I or II (low alkali) as best suited to job conditions., domestic manufacturer.
 - 2. Color:
 - a. CMU work: Natural
 - b. Brick Unit Masonry: "Huneysuckle" (N) 7HS, by Mortamix. Telephone number (800) 524-6586.
- B. Masonry Cement: Meeting ASTM C-91-83a, non-staining, 22% maximum air content by volume.

- C. Hydrated Lime for masonry purpose ASTM C207-79 (reapproved 1984), Type S.
- D. Aggregates:
 - 1. Aggregates for normal weight masonry units, ASTM C33-74A.
 - 2. Aggregate for masonry mortar ASTM C144-84, Size No. 2, Natural
 - 3. Aggregate for Cement Grout, ASTM C404-85, fine aggregate, size No. 1.
- G. Water shall be clean and potable, free from deleterious amounts of alkalis, acids and organic materials.

2.02 PROPORTIONS

- A. Type "S" job mixed or bag mixed mortar: Proportion materials by volume in accord with ASTM C270-86a, and C780 or as follows:
 - 1. One part masonry cement to 1/2 part Portland Cement to aggregate proportioned at not less than 2-1/4 nor more than three times volumes of cementitious materials used or;
 - 2. One part Portland cement over 1/4 to 1/2 parts Type "S" hydrated lime to aggregated proportioned at not less than 2-1/4 nor more than three times combined volume of cement and lime use.
- B. Fine grout: Proportion materials by volume in accord with ASTM C476-83 at one part Portland cement to 0.0 to 1/10 part hydrated lime to fine aggregate proportioned at not less than 2 1/4 nor more than three times sum of volumes of cement and lime used.
- C. Coarse grout: Proportion materials by volume in accord with ASTM C476-83 at one part Portland cement and 0.0 to 1/10 part lime to coarse aggregate proportioned at not less than one nor more than two time sum of volumes of cement and lime used and slump measured according to ASTM C143-78 of 8".

2.03 MIXING

- A. Mix mortar and cement grout in power driven, drum type mixers. Operate mixer minimum of five minutes after addition of all materials.
- B. Add water additives and prepackaged color admixture in accord with admixture manufacturer's product data for job mixed mortar.
- C. Addition of other admixtures including anti-freeze ingredients is prohibited.
- D. Measure materials for job mortar in containers with known volume; measurement by shovels is prohibited.
- E. In order to maintain a consistent mix in the correct proportions, Contractor shall provide (and use) 12" X 12" X 12" box. This box shall be used to "Calibrate" shovel mixing of sand and cement. Because of differing job site conditions including temperature, humidity, moisture content, etc., the Contractor shall "Calibrate" shovel proportions at least three (3) times per day.
- F. Mortar Slump: Slump shall be a minimum of 5", not to exceed 8".

2.04 LOCATIONS

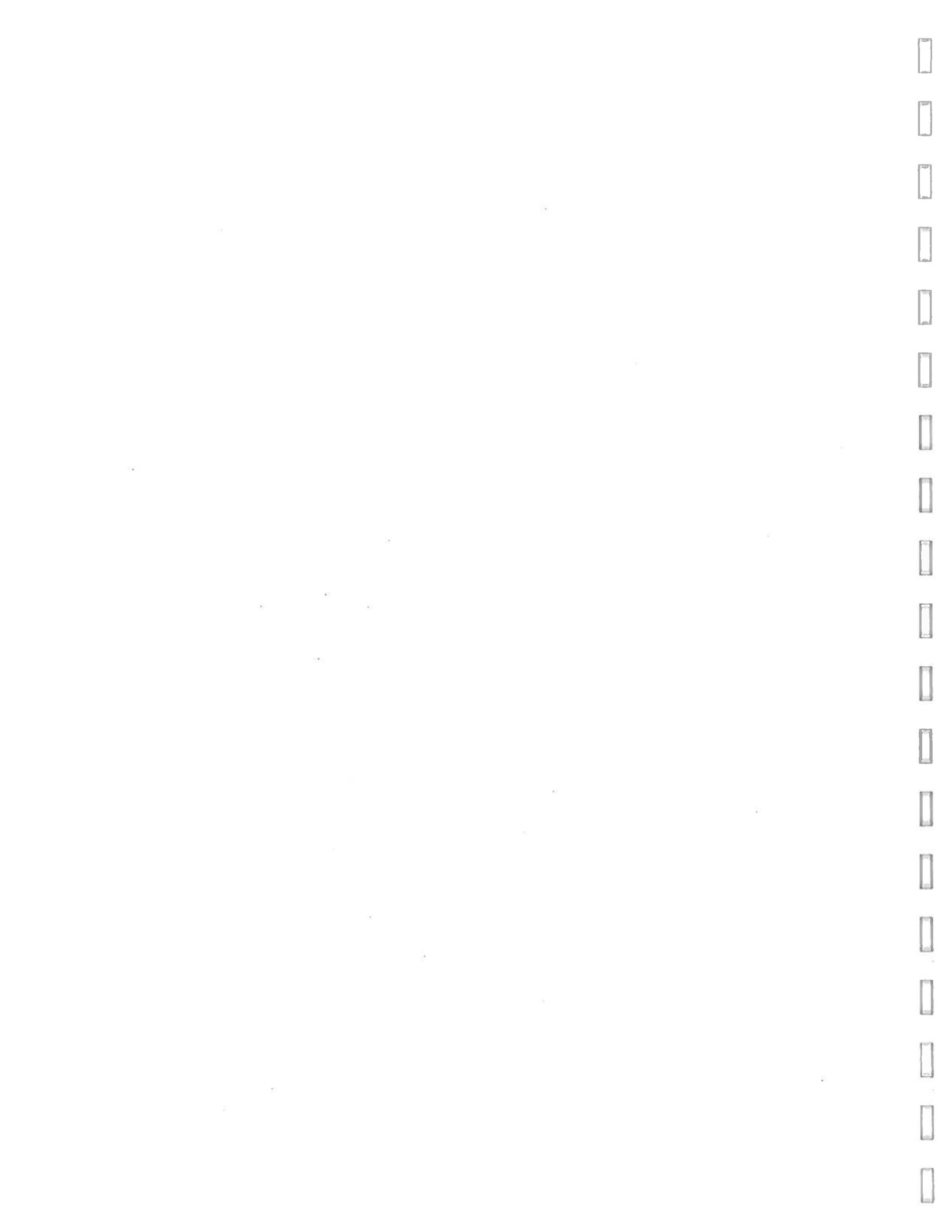
- A. All Cement Masonry Units (CMU) locations**
- B. Brick Unit Masonry**

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Place mortar as directed in Section 04200 Unit Masonry.**
- B. Re-temper mortar as necessary to keep plastic. Use of mortar after setting has begun or after 2-1/2 hours has elapsed since initial mixing is prohibited.**
- C. Place grouts as specified in other sections.**

END OF SECTION



SECTION 04200

UNIT MASONRY

PART 1 - GENERAL

1.01 DESCRIPTION

- A. All masonry work, steel shelf angles, anchors and accessories.
- B. Thru-Wall flashing installation.
- C. Related Work Specified Elsewhere:
 - 1. Cast-In-Place Concrete: Section 03300
 - 2. Mortar: Section 04100
 - 3. Structural Steel: Section 05120
 - 4. Flashing and Sheet Metal: Section 07600
 - 5. Through Wall Flashing: Section 07651
 - 6. Steel Doors and Frames: Section 08110

1.02 QUALITY ASSURANCE

- A. Materials shall conform to the requirements of the American Society for Testing and Materials specifications listed, and these specifications, unless specifically indicated otherwise on the drawings.
- B. All mortar and masonry units of all types shall be free of materials of any kind which will cause stains, popping or any other detrimental occurrence when installed in locations required by the drawings. Ferrous materials, except in approved forms shall not be present in a form that can cause stains.
- C. Workmanship shall conform to the following: requirements of local building code requirements for masonry - American Standard A.41.1, instructions of each materials manufacturer, applicable published recommendations of the National Concrete Masonry Association, and the requirements of these specifications unless otherwise indicated on the drawings.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Portland Cement ASTM C150-76, Types I, II or III as best suited to job conditions.
- B. Masonry Cement ASTM C-91 & ASTM C-01.
- C. Colored masonry cement - See Section 04100 - Mortar
- D. Hydrated Lime for masonry purpose ASTM C207-76, Type S.
- E. Lime, putty, from quicklime conforming to ASTM C5-5A (1974) and shall be prepared in a plant specially built to slake and age quicklime for use in masonry mortar.
- F. Aggregates:

1. Aggregates for normal weight masonry units, ASTM C33-74A.
 2. Aggregate for masonry mortar ASTM C144-76.
- G. Water shall be clean and potable.
- H. Brick:
1. Standard Face Brick as manufactured by Cherokee Brick Co. Macon, GA, Carolina, Tel: (800) 277-2745. Color to be "St. James" MODULAR Size; grade SW; type FBS, size S/S. ASTM C-216-81. Variations in color and texture shall not exceed those of the samples submitted by the Contractor and approved by the Architect. Provide various brick shapes as indicated below:
 2. Brick Size: Such that three courses (brick plus 3/8" mortar joints) will measure 8 inches. The actual brick dimensions will be 3 1/2" thick, 2 1/4" height, and 7 5/8" in length.
- J. Anchors and ties shall be adjustable of galvanized steels in conformance with local code, but at least equal in strength, size and numbers to conform with requirements of American Standard A41.1 titled American Standard Building Code Requirements for Masonry. Dovetail anchors to code materials and strength to be used to bond masonry to concrete columns.
- K. Steel Shelf Angles: 3 1/2" X 3 1/2" X 1/4" brick shelf angles - lengths as required.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Handle material carefully and avoid damaging them. Protect materials from contact with earth and cover with weatherproof materials until used.
- B. Promptly remove damaged materials from the site or dispose of them outside in approved manner.
- C. Brace walls laterally and protect against freezing as required by code.
- D. Cover tops and top two (2) inches of each side of all walls with strong waterproof membrane securely anchored, except when masonry work is actually in progress or permanent protection from rain is provided otherwise.
- E. Lay only surface dry units, and stop work and cover walls when it rains unless work is protected by weathertight floor or roof construction.
- F. Bond all intersections of masonry walls of all types by laying a true bond with at least 50% of the units at the intersection or bond with approved anchors.
- G. Prepare mortar with only materials herein before specified and in conformance with "proportion specification" of ASTM C270 or C476 mortar for unit masonry.
 1. "S" type mortar shall be used on all walls.
"N" type mortar shall be used on walls below grade.
- H. Lay masonry in running bond, unless otherwise shown. Bond walls at every second block course with horizontal reinforcing.

- I. Provide brick ties and anchors at 16" O.C. each way.
- J. Tool all exposed clay brick joints as initial set takes place. Joints shall be 3/8" thick - "Flush and Rodded".
- K. Lay all masonry plumb and true to lines. Minimum length of any unit in exposed work shall be a half unit, or finished end of a unit. All cuts shall be made with saws. Toothing is not permitted. Exposed surfaces of units shall be free of mortar; failing this, work shall be cleaned with methods recommended by SCPI, NCMA and/or manufacturer of unit. Clean equipment used for mixing, moving, or storing mortar at the end of each day's work.
- L. Cut out defective joints; fill joints solidly and tool to match adjacent work. Fill any holes in mortar joints.
- M. Clean brick as work progresses, keeping surfaces free of mortar daubs and other blemishes with wire brush and trowel. Do not wet wall. Leave wall clean in uniformly finished condition.
- N. Cells and cavities in masonry units and air gaps between brick, stone, or masonry veneers and the structure shall be cleaned of all non-preserved treated or non-naturally durable wood or other cellulose containing material prior to concrete placement.
- O. Contractor shall furnish, maintain and move all scaffolding and hoists he may require for the execution of the work included in this section of the specifications. He shall construct and maintain this equipment in strict accordance with local laws and ordinances.
- P. Lay all brick, sills, copings, lintels and solid units with full bed and head joints.
- Q. Provide 3/8" full height plastic head joint weeps above flashing or as indicated on the drawings at 24" O.C. or as otherwise noted.
- R. Install brick shelf angles in brick coursing except where otherwise required by specific openings. Shelf angles spanning openings shall extend 4" minimum beyond the end of each opening. See Structural Drawings for shelf angle is required to be secured or welded to structure.
- S. Provide brick ties and anchors at 16" O.C. each way.

END OF SECTION



DIVISION 5 - METALS

SECTION	05120	STRUCTURAL STEEL	1 THRU 4
SECTION	05400	LIGHT GAUGE METAL FRAMING	1 THRU 2
SECTION	05500	METAL FABRICATIONS	1 THRU 2



SECTION 05120

STRUCTURAL STEEL

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Furnish and erect all structural steel.
- B. Furnish all necessary anchor bolts, bearing plates, inserts, connection material, and/or other accessories, necessary and incidental to completely erect all structural.
- C. Items that require setting in concrete, or attachment to materials of other trades shall be furnished to the General Contractor for his placing or proper handling. The fabricator's shop drawings shall include accurately dimensioned plans for placement of these items to properly receive the steel.
- D. Related Work Specified Elsewhere:
 - 1. Cast-In-Place Concrete: Section 03300
 - 2. Grout: Section 03600
 - 3. Unit Masonry: Section 04200

1.02 QUALITY ASSURANCE

- A. All structural steel framing shall conform to the American Institute of Steel Construction Specifications for the "Design Fabrication and Erection of Structural Steel for Buildings", latest edition.
- B. Welding
 - 1. Both shop and field welds shall be made only by welders and welding operators who have been previously qualified by test as prescribed in the "Code for Welding in Building Construction" of the American Welding Society, to perform the type of work required by these specifications and the structural drawings.
 - 2. Current and valid certificates of qualifications for both welders and welding operators shall be carried on their persons at all times. Originals of exact reproductions of the certificates shall be delivered to the Architect upon demand.

1.03 SUBMITTALS

- A. Complete fabrication shop drawings and erection plans shall be submitted to the Architect for review prior to fabrication. Shop drawings must carry the stamp of the Contractor showing they have been checked by him. Shop drawings shall include layouts for all structural steel work and all details of construction for fabrication and erection, including anchor bolt setting plan where required. Special erection devices, if required, shall be clearly shown and provided for. Details for bevel and grooved, full penetration type butt weld splices, shall be detailed on the shop drawings. Submit drawings in accordance with Section 01300.
- B. The approval of shop drawings shall not relieve the Contractor of his responsibility for constructional accuracy and fit and for agreement of all information shown on the plans with Architect's and Engineers drawings, specifications and written instructions.

- C. The omission from the Contractor's shop drawings of any materials shown on Contract drawings or called for in the specifications shall not relieve the Contractor from furnishing same or money equivalent even though the Architect has returned such drawings as approved. Inadequate connection details which become apparent after at no cost to the Owner even though the shop drawings have been previously approved by the Engineer and/or Architect unless the specific detail is called to the attention of the Engineer on the shop drawings.

1.04 FIELD MEASUREMENTS

- A. Take all measurements in field as required to verify or supplement dimensions shown on drawings and assume responsibility for fit of all work.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Structural Steel: ASTM A-36 (unless otherwise noted).
- B. Anchor Bolts: ASTM A307
- C. High Strength Bolts: ASTM A325
- D. Welding electrodes for manual-shielded metal arc welding shall conform to E-70XX series (ASTM A233) as required for strength.
- E. Paint: Federal Specification TT-P-86, Type I.

2.02 FABRICATION

- A. Unless otherwise specified, fabrication of structural steel framing shall conform to applicable requirements of the AISC Specification.
- B. All materials used shall be of domestic manufacturer and source of supply.
- C. All bolts to have full shanks, extending through all parts of connecting members. Bolt holes are to be accurately drilled or punched. The several pieces forming one build-up member shall be straight and true and fit closely together, especially where exposed to view.

2.03 SHOP PAINTING

- A. Provide one coat of approved paint to all steel work, except where to be encased concrete or sprayed fireproofing materials.
- B. Clean by hand wire brushing or by other methods elected by the fabricator, of loose mill scale, loose rust, weld slag or flux deposit, dirt or other foreign matter all steel work, whether to be shop painted or not. Remove by solvent all oil and grease deposits.
- C. Clean all contact surfaces as above before assembly. Do not paint contact surfaces.
- D. Surfaces within two inches of any field weld locations to be free of materials that would prevent proper welding or produce objectionable fumes while welding being done.
- E. Exposed steel shall receive field coats. Steel exposed in exterior wall cavities, embedded in outside walls or in contact with earth, shall be field coated on the exposed surface with

an approved mastic unless protected by flashing. All steel required to be shop coated shall be spot painted with material used for shop coat at field bolts, field welds and serious abrasions.

PART 3 - EXECUTION

3.01 PREPARATION

- A. The workmanship and finish shall be equal to best practices in modern structural fabricating work. Materials arriving from the mills should be protected from weather and have clean surfaces before being worked in the shops.
- B. Materials shall be thoroughly straightened in the shop by methods that will not injure them before laid out or worked in any way.
- C. Welding where required shall be in accordance with the "Code for Welding in Building Construction" of American Welding Society.
- D. Shearing and clipping shall be neatly and accurately done.
- E. All bolt holes shall be accurately spaced and punched.

3.02 CONNECTIONS

- A. Shop connections shall be welded or bolted with high strength bolts. Field connection shall be bolted with high strength A325 bolts except as otherwise noted on drawings.
- B. Seated connections on column webs shall be designed as required to prevent bending of column webs. Where feasible, use double angle connections in lieu of seated connections.
- C. Where a shop detail causes excessive eccentric load on member, contractor shall, at no additional cost to Owner, modify the detail as required to produce minimum eccentricity. Any modifications made shall have the approval of the Structural Engineer prior to performing the modification.
- D. If reactions of beams are not shown on drawing, connections shall be selected to support half the total uniform load capacity for given shape, span and steel specification of the beam in question. The effect of concentrated loads near an end connection shall also be considered.

3.03 ERECTION

- A. Erect structural steel in accordance with current requirements of the American Institute of Steel Construction and approved shop drawings. Erect all steel plumb and level within the limits defined by the AISC Code of Standard Practice. Provide all temporary bracing required for proper alignment and stability during erection. Temporary bracing and/or shoring shall remain during erection and as long thereafter as required by safety.
- B. All column bases and leveling plates shall be set by this Contractor but will be grouted by others.
- C. Steel Contractor shall set column bases on steel wedges and angle screeds to accurate elevations prior to placing concrete unless otherwise shown on drawings. Wooden wedges will not be permitted.

- D. Field connections by burning are prohibited unless approved by Architect. Bring assembled parts into close contact using drift pins only for positioning, not to enlarge hole.

END OF SECTION

SECTION 05400

LIGHT GAUGE FRAMING

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Furnish and erect all structural light gauge studs, runner tracks, joist, bridging and miscellaneous members as required to erect all light gauge framing shown on the drawings for exterior framing (see Section 09260 for interior framing).
- B. Related Work Specified Elsewhere:
 - 1. Metal Fabrications: Section 05500
 - 2. Exterior Insulation and Finish System (EIFS): Section 07420

PART 2 - PRODUCTS

2.01 MATERIALS

- A. All framing components shall be of the nailable or screw type, and size as shown on the drawings and shall be manufactured by United States Gypsum Corporation, or equal.
- B. All members shall be formed from 18 gauge steel except where noted and shall be installed as indicated on the drawings or at 24" O.C. maximum.
- C. All framing components including fasteners shall be galvanized.

2.02 FABRICATION

- A. Framing components may be prefabricated into panels prior to erection.
- B. All framing components shall be cut squarely or on an angle as in bracing to fit squarely against abutting members. Members shall be held firmly in position until properly fastened.
- C. Attachments of similar components shall be done by welding, screw attaching, or bolting. Wire tying of framing components in structural application shall not be permitted. Dissimilar stud components shall be welded.

PART 3 - EXECUTION

3.01 ERECTION

- A. Track shall be securely anchored to the floor and overhead structure of member.
- B. When components are secured using mechanical fasteners. The minimum following fastener schedule will be used:

Metal Stud to Metal Stud
joint

Min. 2 - No. 10 pan head self tapping screws at each

Metal Stud to Concrete

HILTI – DNI 22P8 power actuated fasteners at 12" O.C. at continuous tracks or Min. 2 at each joint. Provide min. 1 1/4" penetration.

Metal Stud to Wood

No. 10 flat head countersunk self-tapping screws at 12" O.C. at continuous tracks or Min. 2 at each joint. Provide min. 1 1/4" penetration.

- C. Studs shall be seated squarely in the track with the stud web and flanges abutting the track web, plumbed or aligned, and securely attached to the flanges or web of both the upper and lower tracks.
- D. Butt weld or splices shall be used at all butt joints in the track.
- E. Splices in axial loaded studs shall not be permitted.
- F. All welds shall be fillet, plug, butt or seam.
- G. Field abrasion and welds shall be touched up in the field after erection with the rust resistant paint.

END OF SECTION

SECTION 05500

METAL FABRICATIONS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. All miscellaneous steel shapes and sheet metals.
- B. Sleeves through masonry or concrete for all miscellaneous and ornamental work.
- C. Related Work Specified Elsewhere:
 - 1. Cast-In-Place Concrete: Section 03300
 - 2. Grout: Section 03600
 - 3. Rough Carpentry: Section 06100
 - 4. Metal Door Frames: Section 08100

1.02 QUALITY ASSURANCE

- A. Furnish shop drawings indicating details, methods of assembly and hardware locations of all items to be manufactured for the Project to the Architect for approval.
- B. Furnish cuts of drawings indicating details and method of assembly of all stock items not manufactured specifically for the Project to the Architect for approval.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Stock commercial products suitable for intended use and conforming substantially to details indicated on drawings and these specifications will be acceptable.
- B. Materials shall be type, class, temper, etc., which best suit the intended use and shall conform with the following Federal specifications and other listed standards:
 - 1. Bronze for castings, casting alloy, 85% copper, 5% zinc, 5% tin and 5% lead.
 - 2. Iron castings; gray ASTM A48-74.
 - 3. Priming paint, iron oxide TT-P-31 or synthetic TT-P-636.
 - 4. Screws for use in aluminum or stainless steel work, commercial stainless steel.
 - 5. Steel, structural ASTM A36-75.
 - 6. Pipe Fittings, ASTM A420-75A.
 - 7. Pipe, steel, ASTM A120-73, standard weight
 - 8. Miscellaneous Sheetmetal ASTM A506-73, galvanized 26 gauge.
 - 9. Aluminum, 6063-T5 alloy, shapes and sizes as shown.

2.02 FABRICATION

- A. Miscellaneous steel shall be structural steel of suitable shape for the design. The length of bearings at each end of lintels shall not be less than one (1) inch per foot of span and in no case less than six (6) inches.
- B. Sleeves shall be standard weight steel, wrought iron, or cast iron pipe of size to provide not less than 1/4" clearance all around between inside of sleeve and pipe or other part for which sleeve is required.
- C. Miscellaneous sheet metal that may be required as shown on the drawings or specified. This does not apply to sheetmetal for roofing and flashing or mechanical equipment that is specified under other sections.
- D. Factory made items and sub-assemblies shall conform to the following unless specifically indicated otherwise on the drawings.
 - 1. Fabricate work to shape and size with sharp lines and angles and smooth surfaces. Connections shall be welded, bolted or riveted. Rabbets, lugs, and brackets shall be provided so work can be assembled in a neat substantial, manner. No sharp corner or edges shall be exposed. Joints exposed to weather shall exclude water or be built to drain to exterior.
 - 2. One coat of priming paint shall be applied to all miscellaneous and ornamental iron and steel work, except galvanized materials. Expose areas shall be evenly coated and free from runs, sags and filled corner.

END OF SECTION

DIVISION 6 - WOOD AND PLASTICS

SECTION	06100	ROUGH CARPENTRY	1 THRU 5
SECTION	06190	PREFABRICATED WOOD TRUSSES	1 THRU 3
SECTION	06200	FINISH CARPENTRY	1 THRU 3
SECTION	06401	PRE-FINISHED FOAM TRIMS	1 THRU 2
SECTION	06410	CABINET WORK	1 THRU 4
SECTION	06600	PLASTIC FABRICATIONS	1 THRU 4
SECTION	06610	GLASS FIBER & RESIN FABRICATIONS	1 THRU 2



SECTION 06100

ROUGH CARPENTRY

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Framing Lumber, Plywood Sheathing at Exterior, Floor Sheathing, Roof Sheathing
- B. Blocking and nailing strips grounds.
- C. Dead Wood Blocking in Walls as require for attaching Wall Mounted Items.
- D. Hardware for securing rough carpentry materials.
- E. Pressure Treated Wood Bucks at Exterior Storefront and Windows
- F. Layout Work.
- G. Edge sealing and treatment of all exposed exterior plywood.
- H. Related Work Specified Elsewhere:
 - 1. Cast-In-Place Concrete: Section 03300
 - 2. Fabricated Wood Trusses: Section 06190
 - 3. Finish Carpentry: Section 06200
 - 4. Cabinet Work: Section 6410
 - 5. Flashing and Sheet Metal: Section 07600
 - 6. Toilet and Bath Accessories: Section 10800

1.02 QUALITY ASSURANCE

- A. Lumber grading standards and species, U.S. Department of Commerce PS-20-70.
- B. Plywood grading standards, U.S. Department of Commerce PS-1-74.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Framing lumber shall be #2 Southern Pine minimum allowable bending stress 1200 PSI for single member uses and 1400 PSI for repetitive member uses. Modulus of elasticity = 1,600,000 PSI. Moisture content to be less than 20%.
- B. Blocking, nailing strips and ground lumber, #2 Fir or #3 Southern Yellow Pine.
- C. Plywood: (thickness as noted on drawings)
 - 1. Exterior work, C-D Ext. Exposure 1 - APA.
 - 2. Interior Work, C-D plugged Int. APA.
 - 3. Marine Plywood, A-A Ext- APA-000-PS1-83 (at all exterior exposed and painted plywood.
 - 4. Interior Telephone Board, B-C APA
 - 5. Sheathing APA Rated 32/16 - 1/2", 5/8" or 3/4" thick exposure I.

- D. Wood preservations treating practices, Federal Specification TT-W-571. Treated wood shall be delivered with moisture content specified for untreated wood. Omit incising on exposed surfaces. Use paintable type treatment on exposed members and members in contact with finished materials. Brand or stamp, all materials face and treated material shall also bear the AWPI quality mark, or that of an independent inspection agency that maintains continuing control testing and inspection over the quality of the product.
- E. Rough hardware, commercial quality, of ample size and type to support live and dead and to hold members securely in place and in conformance with national design specifications recommended by National Forest Products Association. Other fastening devices, either hand or machine driven, may be used if equally suitable and as strong as those shown or specified, and if such performance qualities have been properly determined, and if the Architect has given written approval of each type, size and use of such devices.
 - 1. Anchor bolts, nuts and washers and other anchors to masonry to be hot dipped galvanized.
- F. Dead Wood Blocking in partitions - 1 X or 2 X members as indicated on the drawings. Dead Wood blocking location in fire rated partitions to be fire retardant.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Horizontal wood members with any part to be placed less than 24" from finished grade, underside of concrete floor or footing, or other ground, earth or soil, shall be pressure preservative treated. Also, all wood nailing blocks and strips of all kinds shall be treated suitable species.
- B. Work shall be performed in conformance with good trade practice, recommendation of manufacturer's building codes, and these specifications unless specifically indicated otherwise on the drawings.
 - 1. Fasten securely all parts of rough carpentry work in their proper place.
 - 2. Store lumber so it is properly ventilated; held straight, well-drained; protected from the elements; supported at points not over four (4) feet apart from bottoms of piles at least 1 1/2" above basic support; i.e. ground, concrete, wood floors, etc.
 - 3. Do not use in the permanent parts of the work any material that is unsuitable from any cause.
 - 4. Layout work carefully; cut material to fit; level, plumb, and brace to hold work in proper positions; drive nails and spikes home; and pull bolt nuts tight with heads and washers in close contact with work.
 - 5. Install all plywood in conformance with recommendations of manufacturers, building codes, recognized associations, and those specifications unless specifically indicated otherwise on the drawings. In case of conflict, the best and most restrictive requirements shall govern as determined by the Architect.
 - 6. See Structural Drawings for all methods of connection for all wood framing members, nailing patterns for plywood sheathing, etc.

C. Roof Sheathing

1. Inspect roof truss installation.
2. Verify that the plane of the top of trusses or wood framing is true and consistent. Snap string lines along all hips, ridges, on the plane of the roof sheathing in all directions. Provide supplemental framing and/shims to achieve true and consistent plane. Level to +/- 1/4" in 20', and properly sloped to valleys or eaves.
3. See Structural Drawings for fasteners and spacing to secure plywood sheathing

3.02 FASTNERS

- A. Fasteners in Pressure Treated Wood: All fasteners to be installed in lumber treated with water based preservatives called "alkaline copper quaternary (ACQ) must be "Stainless Steel".
- B. Fastener Schedule

CONNECTION	FASTENER	NO. OR SPACING
Band joist to sill or top plate, toe nail	8d	6 in. o.c.
Joist to band joist, face nail	16d common	3
Joist to sill or girder, toe nail	8d common	3
Bridging to joist, toe nail end	8d common	2
Ledger strip	16d common	3 at each joist
1 X 6 or less subfloor to each joist, face nail	8d common	2
Over 1 X 6 subfloor to each joist, face nail	8d common	3
2-inch subfloor to joist or girder, blind & face nail	16d common	2
Sole plate to joist or blocking, face nail	16d common	16 in. o.c.
Top or sole plat to stud, end nail	16d common	2
Stud to sole plate, toe nail	8d common	4
Double studs, face nail	10d common	24 in. o.c.
Double top plates, face nail	10d common	16 in. o.c.
Top plate, lap and intersections face nail	---	2-16d or 3-10d common
Continuous header, two pieces	16d	16 in. o.c.along each edge
Ceiling joists to plate, toe nail	8d common	3
Continuous header to stud, toe nail	8d common	3
Ceiling joists, laps over partitions, face nail	---	3-16d or 4-10d common
Ceiling joists to parallel rafters, face nail	---	3-16d or 4-10d common
Rafter to plate, toe nail	8d common	3
1-inch brace to each stud and plate, face nail	8d common	2
1 X 8 or less sheathing to each bearing, face nail	8d common	2
Over 1 X 8 sheathing to each bearing, face nail	8d common	3
Built-up corner stud	16d common	24 in. o.c.
Built-up girders and beams, of three members	20d common	32 in. o.c. at top and Bottom and staggered 2 Ends and at each splice
2-inch planks	16d common	2 each bearing
Studs to sole plate, end nail	16d common	2 each end

Wood Structural Panel Subflooring

15/32 in., 1/2 in., 7/16 in.	6d common annular or spiral thread	6 in. o.c. edges and 12 in. o.c. intermediate

19/32 in. – 3/4 in.	8d common or 6d or spiral	6 in. o.c. edges and 12 in. o.c. intermediate
1 in., 1 1/8 in.	10d common or 8d annular or spiral thread	6 in. o.c. edges and 6 in. o.c. intermediate

Wood Structural Roof & Wall Sheathing and Particleboard Wall Sheathing

1/2 in. or greater	8d common (wall)	6 in. o.c. edges and
19/32 in. or greater	10d common (roof)	12 in. o.c. intermediate
	8d common	6 in. o.c. edges and 12 in. o.c. intermediate
Panel to Metal Stud	No 10 flat head (wall) Countersunk screws 1 1/4" penetration	6 in. o.c. edges and 12 in. o.c. intermediate

Fiberboard Sheathing(1)

1/2 in. regular	6d common or 11 ga. galv. nail 1 1/2 in. long with 7/16 in. head	6 in. o.c. at edges, 12 in. o.c. at other bearing areas
1/2 in. structural	8d common or 11 ga. galv. nail 1 1/2 in. long with 7/16 in. head	3 in. o.c. at edges, 6 in. o.c. at other bearing areas
25/32 in	8d common or 11 ga. galv. nail 1 3/4 in. long with 7/16 in. head	3 in. o.c. at edges, 6 in. o.c. at other bearing areas
Panel to Metal Stud	No 10 flat head (wall) Countersunk screws Min. 3/4" penetration	3 in. o.c. edges and 6 in. o.c. at other bearing areas

Gypsum Sheathing

1/2 in.	11 ga. 1 1/2 in. galv. 7/16 in. head	4 in. o.c. edges 8 in. o.c. at other areas
5/8 in.	11 ga. 1 3/4 in galv. 7/16 in head	4 in. o.c. at edges 8 in. o.c. at other areas
Panel to Metal Stud	No 10 flat head (wall) Countersunk screws Min. 3/4" penetration	4 in. o.c. edges and 8 in. o.c. at other areas

Gypsum Wallboard

1/2 in.	1 3/8 in. drywall nail (2)	7 in. o.c. on ceilings

5/8 in.	1 1/2 in. drywall nail(2)	8 in. o.c. on walls 7 in. o.c. on ceilings 8 in. o.c. on walls
<u>Particle board Siding</u>		
5/16 in. - 1/2 in. (3)	6d(4)	
5/8 in. (5)	8d(4)	
3/4 in. (6)	8d(4)	
<u>Hardwood Lap Siding</u> (direct to studs)(5)		
	8d(8) corrosion resist. with min. shank dia. of 0.099 in. and min. head dia. of 0.240 in.	16 in.o.c. at top and bottom edges
<u>Hardboard Lap Siding</u> (over sheathing)		
	10d(6) corrosion resist. with min. shank dia. of 0.099 in. and min. head dia. of 0.240 in.	16 in.o.c. at top and bottom edges
<u>Hardboard Panel Siding</u> (direct to studs)		
	6d(6) corrosion resist. with min. shank dia. of 0.092 in. and min. head dia. of 0.225 in.	6 in.o.c. at edges and 12 in. o.c. at intermediate supports
<u>Hardboard Panel Siding</u> (over sheathing)		
	8d(6) corrosion resist. with min. shank dia. of 0.092 in. and min. head dia. of 0.225 in.	6 in.o.c. at edges and 12 in. o.c. at intermediate supports

Note:

- (1) Not used
- (2) Drywall nails shall conform to ASTM C514
- (3) Siding applied to 5/8 in. net wood sheathing, 15/32 in. wood structural panel or 1/2 in. particleboard sheathing.
- (4) Corrosion-resistant nails spaced 6 in. on center at edge and 8 in. on center at intermediate supports. Nails shall have a minimum edge distance of 3/8 in.
- (5) Siding applied to studs spaced 16 in. on center maximum.
- (6) Siding applied directly to studs spaced at 24 in. on center maximum.
- (7) Use annular or spiral thread nails for combination subfloor/underlayment (single floor).
- (8) Nail must be of sufficient length to accommodate thickness of siding and sheathing, if used, and allow minimum stud penetration of 1 1/2 in.
- (9) For 1-inch wood structural panels, 12 in. on center intermediate nailing shall be permitted.

END OF SECTION



SECTION 06190

PREFABRICATED WOOD TRUSSES

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Prefabricated Wood Trusses
- B. Permanent Setting of Trusses
- C. Bridging, Bracing and all related hardware.
- D. Related Work Specified Elsewhere:
 - 1. Rough Carpentry: Section 06100

1.02 QUALITY ASSURANCE

- A. The design and fabrication criteria of all wood trusses shall meet with "National Design Specifications for Stress Grade Lumber and Its Fastenings" by National Forest Products Association (latest revision), "Timber Construction Standards" by American Institute of Timber Construction (latest revision); and "Design Specifications for Light Metal Plate Connected wood Trusses by Truss Plate Institute (latest revision), the same as if those specifications and all their references were set out in full herein.
- B. All truss designs shall bear the name and seal and/or registered number and state of registration of Licensed Professional Engineer.

1.03 SUBMITTALS

- A. Truss designs shall include the following information:
 - Pitch, span, dimensions and spacing of truss
 - Truss bearing sizes and locations
 - Design loading of truss and allowable stress increase
 - Axial forces in each truss member
 - Nominal sizes and location of connector plates at all joints
 - Size, species and stress of grade lumber for all truss members
 - Camber
 - Permanent lateral bracing as required by design to reduce buckling length of individual truss members only
 - Handling and erections recommendations
- B. Truss design and/or shop drawings shall be submitted to the Architect for his review in accordance with Section 01300.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Lumber

1. All lumber used for truss member shall conform to the published stress ratings or the species and grades as set out in the official grading rules of the appropriate lumber association or as listed in the reference specifications.
2. At the time of fabrications, the moisture content of all lumber shall be within the proper limits, as stated in the reference specifications.
3. All lumber shall conform to the species and fully recognized nominal sizes as shown on the plans or truss engineering designs. All members shall be cut from lumber that bears the proper grade-mark stamps of a recognized grading association or licensed lumber inspection agency. No lumber shall be used which does not appear to conform to the proper dimension and/or grades.

B. Connectors

1. All truss connector plates shall be manufactured from ASTM-A446, Grade A, prime commercial quality galvanized sheet steel of no less than 20 gauge thickness which has a minimum yield of 33,000 psi and a minimum ultimate tensile strength of 45,000 psi. The corrosion resistant coating shall be ASTM-A525, "Specification for Steel Sheet, Zinc Coated (Galvanized) by the Hot-Dip Process. All metal connectors shall have a series of nail-like projections that are designed to separate the fibers of the wood into which they are pressed, in accordance with accepted nailing practices. All connector plated truss joints shall be designed using the net area plating method as set forth in TPI Standards LATEST EDITION.

2.02 FABRICATION

- A. All trusses and other roof structural components shall be fabricated in a properly equipped manufacturing facility of a permanent nature. They shall be manufactured by experienced workmen, using precision cutting and truss fabricating equipment, under the direct supervision of a qualified foreman. All trusses shall be fabricated under strict rules of inspection and quality control as the local code may require, open to the inspection of the Architect or his representative at all times.

- B. All truss members shall be accurately cut to length, angle and be true to line to assure tight joints for finished truss.

Trusses are to be manufactured so that all individual pieces comprising the perimeter members, including but not limited to top and bottom chords, have a maximum deviation of 1/4" inches in 20 feet over the continuous length of the plane created by these members

Trusses are to be designed and manufactured so that all components, when erected, create continuous planes or lines, including roof planes, hips, ridges, valleys, etc. that have a maximum deviation of 1/4" in 20 feet over the length of each.

- C. All truss members and connector plates shall be properly placed in special jigs and the members tightly clamped in place, remaining in that position until the connector plates have been pressed into the lumber simultaneously in both sides of the joints.
- D. Camber shall be built into the trusses, as noted on the engineering truss designs, by properly positioning the members in the fabricating jigs.
- E. Each truss shall be stamped with the name and address of the Truss Manufacturer.

PART 3 - EXECUTION

3.01 HANDLING, ERECTION AND BRACING

- A. Fabricated trusses and sub-components shall be so handled and stored that they are not subject to damage. If the trusses are to be stockpiled prior to erection, sufficient bearing points and/or bracing shall be provided to prevent excessive lateral bending and tipping over.
- B. Framing anchors and/or truss hangers shall be provided by the Contractor in accordance with the architectural plans.
- C. Field erection of the trusses, including items such as proper handling, safety precautions, temporary bracing to prevent toppling or dominoing of the trusses during erection, and any other safeguards or procedures consistent with good workmanship and good building erection practices, shall be the responsibility of the General Contractor and/or the Erection Contractor and shall be in accordance with bracing wood trusses: Recommendations (BTW-76) as published by the Truss Plate Institute.
- D. During the entire construction period, all Contractors shall provide a means for adequate distribution of concentrated loads so that the carrying capacity of any one truss and/or other component is not exceeded.
- E. Proper erection bracing shall be installed to hold the trusses true and plumb and in safe condition until permanent truss bracing and bridging can be solidly nailed in place to form a structurally sound roof framing system. All erection and permanent bracing shall be installed and all components permanently fastened before the applications of any loads.
- F. The permanent structural cross-bracing to ensure the overall rigidity of the roof system, shall be in accordance with the architectural plans of the building structure.

END OF SECTION



SECTION 06200

FINISH CARPENTRY

PART 1 - GENERAL

1.01 DESCRIPTION

- A. All exposed exterior and interior woodwork include interior wood storefront
- B. All necessary rough hardware for securing woodwork in place.
- C. Installation of finish hardware and weatherstripping and seals.
- D. Related Work Specified Elsewhere:
 - 1. Rough Carpentry: Section 06100
 - 2. Architectural Woodwork: Section 6400
 - 3. Cabinet Work: Section 06410
 - 4. Wood Columns: Section 06420
 - 5. Sealants: Section 07900
 - 6. Wood Doors: Section 08210
 - 7. Finish Hardware: Section 08710
 - 8. Painting: Section 09900

1.02 QUALITY ASSURANCE

- A. Lumber grading standards and species, U.S. Department of Commerce PS-20-70.
- B. Plywood grading standards, U.S. Department of Commerce PS-1-74.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Softwood
 - 1. Poplar, Grade B or better.
 - Interior Standing and Running Wood Trims including casing, trim boards, crown moldings, door jambs, etc. for opaque finishes.
- B. Plywood:
 - 1. Exterior work, A-C Ext. - APA.
 - 2. Interior Work, A-A Int. APA.
 - 3. Marine Plywood, A-A Ext- APA-000-PS1-83
 - 4. Fire Retardant Plywood, BC Ext. APA
- C. Hardware, nails, screws, bolts, etc. for securing finish carpentry in place shall be commercial quality. Any suitable type and finish for interior dry locations. Galvanized or nonferrous hardware for all exterior work and for interior work in wet areas.
- D. White lead past, TT-W0025L, Type B.

- E. Sealing compound, TT-S-00239 or TT-S-227, Type 1 or 2 to suit job conditions.
- F. High pressure laminate: High-pressure laminate shall be general purpose Grade. High heat resistant type, Pattern and color to be determined by the Architect. Provide plastic balancing sheet on underside of laminate. Grain "photographing" of the plywood underlayment shall be cause for rejection. See Plastic Laminate Code Schedule on drawings for manufacturer, type, pattern, color, etc.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Work shall be performed in conformance with good trade practices, recommendations of manufacturer's, building codes and these specifications.
 - 1. Protect materials against dampness and other damage during and after delivery. Store materials in dry, well-ventilated buildings free of extremely high or low temperatures and humidity, and extreme variations thereof.
- B. Finish
 - 1. All wood standing or running trim, moldings, etc. scheduled to be field finished shall be "back-painted" prior to installation. Coordinated pre-installation finish preparation with paint contractor.

3.02 INSTALLATION

- A. All work shall be well fitted and securely fastened in its proper location with nails, screws, or other approved fastening devices.
- B. Do not install work until material has been primed as specified in Section 09900.
- C. Interior trim shall have mitered corners.
- D. Provide intermediate support for shelves and poles greater than 3'-0" apart.
- E. All joints to be staggered with adjacent members on multi-member cornices
- F. Moldings and trim shall be installed in maximum lengths possible to minimize joints.
- G. All field joints to be tightly fitted and flush.
- H. Filed joints in running trim to be diagonal (scarfed) joints.
- I. Exposed ends of running trims shall be profiled and self-mitered returns.
- J. All exposed fastening shall be deep set.
- K. All factory-finished moldings shall be back primed.
- L. Cope or miter inside corners where applicable to produce tight fitting joints.
- M. Miter outside joints to produce tight fitting joints.
- N. Moldings to receive transparent finish shall be selected for compatibility of grain and color.
- O. No warped or twisted moldings shall be allowed.

- P. Install fire retardant plywood full height on wall indicated on the floor plans (typically at Telephone/Data Rooms)

END OF SECTION



SECTION 06401

PREFINISHED FOAM TRIMS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Pre-Finished Foam Trim
- D. Pressure Cleaning of existing surfaces.
- E. Related Work Specified Elsewhere:
 - 1. Cast-In-Place Concrete: Section 03300
 - 2. Unit Masonry: Section 04200
 - 3. Furring and Lath: Section 09205
 - 4. Cement Plaster (Stucco); Section 09220
 - 5. Painting: Section 09900
- B. All material shall meet Federal Specifications and ASTM Standards

1.03 SUBMITTALS

- A. Samples and manufacturer's data shall be submitted on materials specified in this section in accordance with Section 01300.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Pre-Finished Foam Trims: As manufactured by the Foam Factory, 3510 NW 53rd Street, Ft. Lauderdale, FL 33309, Tel: 800-492-1002.

Approved equal: Architectural Foam Supply, 150 SW 1st Count, Pompano Beach, FL 33069, Tel: 954-943-6949.

- B. Materials:
 - 1. Trim: 1.5 lb. density polystyrene foam shapes (as indicated on the drawings) , exterior grade, with "Tough Coat" factory applied latex finish.
 - 2. Adhesives: PL Premium Polyurethane Construction Adhesive and Enerfoam Foaming Adhesive.
 - 3. Caulk: Latex or Urethane Caulk.
- C. Finish Texture: "Smooth"

PART 3 - EXECUTION

3.01 PREPARATION

- A. Existing Construction: All Masonry or concrete scheduled to receive new trim application shall be pressure cleaned to remove all deleterious materials, oils, compounds, flaking or peeling paint, etc.

3.02 INSTALLATION

A. Foam Trim

Installation of Mouldings (using PL Premium Adhesive)

1. After substrate is installed snap chalk lines, level and plumb as locations to receive foam trims. Coordinate and verify locations and alignment of trims that are continuous around the building or portion of building so that beginning and ending segments meet.
2. Apply adhesive to back of first piece of moulding (apply adhesive every twelve inches on small pieces and six to eight inches each way on large profiles. Do not use caulking or acrocrete stucco as an adhesive.
3. Apply moulding to wall and hold in place until adhesive sets.
4. Apply Enerform generously to the end of first piece. Smear that surface to the location to be bonded. Remove moulding and allow about 1 minute for the adhesive to get tacky. Re-apply to wall surface. (Continue same procedure with remaining pieces until moulding is installed)
5. Prepare next piece with PL Premium adhesive.
6. Join pieces tightly and secure second piece to wall.
7. When second piece is secure, go back and smooth Enerfoam that has been pushed out of the joint.
8. Continue installation process until all mouldings are applied.
9. Caulk completely around perimeter and at the seams to prevent water from penetrating between the moulding and wall.
10. Press caulking into all seams and let cure.
11. Touch up all seams with substrate and allow to dry.
12. Sand seams if necessary and touch-up paint.
13. All paint, caulk and other installation materials must be water based products. Petroleum products should not be used.

END OF SECTION

SECTION 06410

CABINETWORK

PART 1 - GENERAL

1.01 DESCRIPTION

Casework and banking counters, Tellerline, etc.

B. Countertops, Wood Countertop Edge Trim, and connections to wall.

C. Installation

D. Related Work Specified Elsewhere:

Rough Carpentry: Section 06100

1.02 SUBMITTALS

A. Shop drawings shall be submitted in accordance with Section 01300.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Casework

1. AWI Quality Grade - Custom - Grade I.

2. Construction - Flush Overlay

B. Douglas Fir Plywood

1. Douglas Fir plywood shall be U.S. commercial standard CS-45-58, Grade A-C, exterior type for all countertops and back splashes

C. Particleboard

1. Particleboard shall be 3-ply sandwich laminate, manufactured from resin-treated wood particles. Overall thickness shall be 3/4" unless otherwise specified hereinafter or other indicated on the drawings.

D. Hardwood Trim

1. Shall be Birch Grade B or better.

E. Countertop Edge and Trim

1. 1 1/2" diameter half round, cherry trim - stained.

2. 1/2" diameter half round, cherry trim - stained

F. Laminated Plastic for Cabinet Work and Doors

1. Surface shall be high-pressure laminated plastic, equal to or exceeding performance standards set by National Electrical Manufacturer's Association (Nema LD-3.1-1985). Horizontal applications to be Grade GP-50; Backing sheet to be Grade BK-20.
2. See Plastic Laminate Code Schedule on drawings for color, pattern, manufacturer and location of plastic laminate.

G. Cabinet Hardware

1. Concealed Hinges:

Grass America, Inc. P.O. Box 1019 Kernersville, NC 27284, (800) 334-3512.

3903 - Full Overlay - 165°

3603 - Full Overlay - 95°

2. Drawer Slides:

Knap & Vogt, 2700 Oak Industrial Dr. N. E., Grand Rapids, MI 49505, (616) 459-3311

KV 1320 self closing 3/4 extension for drawers greater than 12" in depth

KV 1428 full extension for drawers 12" or less in depth

KV 8505 1 1/2" overtravel for all lateral files

3. Shelf Standards:

Knap & Vogt, 2700 Oak Industrial Dr. N. E., Grand Rapids, MI 49505, (616) 459-3311

KV255 Recessed Standard

KV256 Closed type shelf support

4. Drawer and Door Pulls:

Hafelle America Co., 3901 Cheyenne Dr., Archdale, NC 27263, (919) 889-2322

Model No.116.39.811

Brass Wire Handle, Polished and laquered, 40 mm wide with 32 mm centers

5. Checkwriting Counter Waste Doors:

Matel Manufacturing Inc., 12811 South Figueroa, Los Angeles, CA 90061, (800) 217-7606

Model No: W2401

Finish: Polished Brass/Bronze Finish No. 62

8. Checkwriting Counter Pull Out Waste Container:

Rev-A-Shelf, 2409 Plantside Drive, Jeffersontown, KY 40299, Tel: (502) 499-5835

Model: No. RV-8PV
20 Quart Vanity Waste Container
8 7/8 " wide X 16" deep slides - cabinet mounted
(floor) brackets with matching bin

9. Piano Hinge (Continuous Hinge) (at Tellerline transaction shelf):

Stanley: 1 1/2" wide by require length

10. Touch Latches (at Wall cabinets above microwave)

Stanley or equal

11. Grommets:

Hafele America co, 3901 Cheyenne Dr. Archdale, NC 27263, (919) 889-2322

Model No. 429.93.313 - Black Two Piece, 56mm dia.

12. Hole Covers - Screw, Nail, etc.

At locations where fabricated items must be connected to adjacent surfaces or materials with screws, nails, or other fastening devices, all exposed or visible screw, nail or line boring holes, etc. are to be covered with PVC, unfinished wood, finished wood, or custom color covers to match surface finish. Covers are to be manufactured by "FastCap" 3725 Irongate Rd., Suite 105, Bellingham, WA 98226, (tel. 888-443-3748) or approved equal.

H. Interior Finish

1. All interior surfaces shall be covered with white vinyl cabinet line unless otherwise indicated on drawings.

I. Caulk - Color to match adjacent millwork finish.

PART 3 - EXECUTION

3.01 PREPARATION

A. General

1. All cabinetwork items shall be constructed at the mill in accordance with approved shop drawings and shall be of highest quality consistent with the accepted standards of the trade. Joints shall be fitted accurately and tight, rabbet or mortise, secured by gluing and nailing. Use concealed screws and bolts where required for structural rigidity; sand smooth and set all nails to prepare for puttying and application of finish. Provide hardwood edging for veneer and plywood edges normally exposed to view and of particleboard for work normally concealed from view. All hardwood shall be free from damage, accurately installed, fitted and adjusted and in an acceptable working condition. All exposed surfaces shall have laminated plastic applied where indicated on drawings or as

noted in the finish schedule. All interior surfaces shall be covered with white vinyl cabinet liner unless otherwise indicated on drawings.

B. Plastic Laminate or Wood Veneers

1. Plastic laminates and wood veneers shall be applied so that the direction and/or orientation of the patterns are consistent. All vertical surfaces have the same orientation/direction. All horizontal surfaces are to have the same orientation/direction.

3.02 INSTALLATION

- A. All work shall be executed by skilled mechanics with continuous experience in the trade. All field connections shall be concealed.

END OF SECTION

SECTION 06600

PLASTIC FABRICATIONS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Cellular PVC Trim Boards,, soffits, battens, frieze boards, rake boards
- B. Adhesive (as provided by trim manufacturer) , sealants and fasteners
- C. Heat Forming where required.
- D. Related Work Specified Elsewhere:
 - 1. Rough Carpentry: Section 06100
 - 2. Finish Carpentry: Section 06200
 - 3. Sealants: Section 07900

1.02 QUALITY ASSURANCE

- A. Regulatory Requirements: Check with Local Building Code for installation requirements.
- B. Allowable tolerances
 - 1. Variation in component length: -0.00/ +1.00"
 - 2. Variation in component width: +/- 1/16"
 - 3. Variation in component thickness: +/- 1/16"
 - 4. Variation in component edge cut: +/- 2"
 - 5. Variation in density: -0% + 10%
- C. Workmanship, Finish, and Appearance
 - 1. Free foam cellular pvc that is homogeneous and free of voids, holes , cracks, and foreign inclusions and other defects. Edges must be square, and top and bottom surfaces shall be flat with no convex or concave deviations.
 - 2. Uniform surface freefrom cupping, warping, and twisting.

1.03 SUBMITTALS

- A. Submit manufacturer's data and cut sheets, installation instructions accordance with Section 01300.

1.04 DELIVERY, STORAGE AND HANDLING

- A. The protection, delivery, storage and handling of cast plastic fabrications shall be according to the instructions furnished by the manufacturer. Storage of materials must be in a dry and well-ventilated area. Trim materials should be stored on flat shipping pallet. Handle to prevent damage to product edges and corners. Store under protective covering to prevent jobsite dirt and residue from collecting on the boards.

1.05 WARRANTY

- A. Provide manufacturer's 25 year warranty against defects in manufacturing that cause the products to rot, corrode, delaminate, or excessively swell from moisture.

PART 2 - MATERIALS

2.01 MANUFACTURER

- A. Acceptable products: AZEK Trimboards as manufactured by Vycom Corporation, 801 Corey Street, Moosic, PA 18507
- B. Material: Free foam cellular pvc material with a small-cell microstructure and density of .55 grams/cm³.
- C. Products
 - 1. Trimboards, sizes as indicated on the drawing.
 - 2. Cornerboards
 - 3. Sheets, thicknesses as indicated on the drawings
 - 4. Beadboard - 1/2" X 6" x 18'

2.02 ACCESSORY PRODUCTS

- A. Fasteners:
 - 1. Use fasteners designed for wood trim and wood siding (thinner shank, blunt point, full round head).
 - 2. Use a highly durable fastener such as stainless steel or hot-dipped galvanized.
 - 3. The use of staples, small brads and wire nails as fastening members is prohibited.
 - 4. The fasteners should be long enough to penetrate the solid wood substrate a minimum of 1 1/2".
- B. Adhesives
 - 1. As provided by the Trimboard manufacturer.
- C. Sealants
 - 1. Use urethane, polyurethane or acrylic based sealants without silicone.

2.03 FINISHES

- A. PVC products do not require paint for protection, but may be painted to achieve a custom color.
- B. Preparation:
 - 1. No special surface preparations are required prior to painting - sanding is not necessary for paint adhesion.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Manufacturer's Instructions:
 - 1. Comply with manufacturer's product written instructions for installation.

B. Cutting:

1. Trimboards can be cut using the same tools used to cut lumber.
2. Carbide tipped blades designed to cut wood work well. Avoid fine tooth metal cutting blades.
- 3.. Rough edges from cutting may be caused by excessive friction, poor board support, or worn or improper tooling.

C. Drilling:

1. Trimboards can be drilled using the same tools used to drill lumber
2. Drilling is similar to drilling hardwood. Care should be taken to avoid frictional heat build-up.
3. Use standard woodworking drills. Do not use drills made for rigid pvc.
4. Periodic removal of material shavings from drill hole may be necessary.

D. Milling

1. Trimboards can be milled using standard milling machings used to mill lumber.
2. Relief Angle 20° to 30°.
3. Cutting speed to be optimized with the number of knives and feed rate.

E. Routing

1. Trimboards can be routed using standard router bits and the same tools used to rout lumber.
2. Carbide tipped router bits are rcommended.

F. Edge Finishing

1. Edges can be finished by sanding, grinding, or filling with traditional woodworking tools.

G. Heat Forming

1. Curved or other non-standard shapes required bending in directions parallel to the width of the trimboard is to be accomplished by heat forming. Heat treating of all pvc products to be per the manufacturer's instructions.

G. Fastening

1. Use 2 fasteners at every framing member for trimboard applications
2. Trimboards over 12" wide , as well as sheets, will require additional fastener at 12" O.C.
3. Fasteners must be installed no more than 2" from the end of each board.
4. All work shall be well fitted and securely fastened in its proper location with nails, screws, adhesive, or other approved fastening devices.
5. Trimboards should be fastened into a flat, solid substrate. Fastening into hollow or uneven areas must be avoided.
6. Pre-drilling is typically not required unless large fasteners are used or product is installed at low temperatures.
7. 3/8" and 1/2" sheet product is not intended to be ripped into trim pieces. These profiles must be glued to substrate and mechanically fastened.
8. Sheet products installed over solid substrate (i.e. plywood) to be nailed and glued.
9. Allow 1/8" per 18 foot joint for expansion and contraction for all trim

- H. Gluing
 - 1. All edge to edge connections, joints, scarf joints, etc. to be glued the full length of the joint.
- I. All work shall be well fitted and securely fastened in its proper location with nails, screws, or other approved fastening devices.
- J. Interior trim shall have mitered corners.
- K. All joints to be staggered with adjacent members on multi-member trims
- L. Moldings and trim shall be installed in maximum lengths possible to minimize joints.
- M. All field joints to be tightly fitted and flush.
- N. Filed joints in running trim to be diagonal (scarfed) joints.
- O. Exposed ends of running trims shall be profiled and self-mitered returns.
- P. All exposed fastening shall be deep set.
- Q. Cope or miter inside corners where applicable to produce tight fitting joints.
- R. Miter outside joints to produce tight fitting joints.
- S. No warped or twisted moldings shall be allowed.
- T. All joints to be lightly sanded as required.

END OF SECTION

SECTION 06610

GLASS FIBER & RESIN FABRICATIONS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Prefabricated Fiberglass Reinforced Polyester Cupola

1.02 SUBMITTALS

- A. Submit manufacturer's data and cut sheets, installation instructions accordance with Section 01300.

1.03 DELIVERY, STORAGE AND HANDLING

- A. The protection, delivery, storage and handling of cast plastic fabrications shall be according to the instructions furnished by the manufacturer. Storage of materials must be in a dry and well-ventilated area.

1.04 WARRANTY

- A. The manufacturer shall provide a written ten (10) year limited warranty against structural failure.

PART 2 - MATERIALS

2.01 MANUFACTURER

- A. The cupola shall be prefabricated of fiberglass reinforced polyester (FRP) as manufactured by Fiberglass Specialties, Inc. P.O. Box 1340, Henderson, TX 75653, Tel: (800) 527-1459.
- B. Model Number: CU1105,
Round Top
Krinkglas Windows.
With Optional Weather Vane - N - S (See drawings for style).
- C. Finish: Unit shall have smooth, UV resistant high gloss gel-coat finish, color - white.
- D. All components shall be pre-fit at the factory to assure proper fit and ease of installation.
- E. Unit shall be adequately reinforced to prevent warping and buckling of surface panels with adequate strength to withstand winds of up to 100 MPH. All anchoring members shall be steel.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Installation shall be by an experienced contractor using anchor rods or bolts as shown on structural drawings. Location of base anchor bolts shall be determined by manufacturer's shop drawings.

- B. Install per manufacturer's written recommendations.

END OF SECTION

DIVISION 7 - THERMAL & MOISTURE PROTECTION

SECTION	07160	BITUMINOUS DAMPPROOFING	1 THRU 2
SECTION	07190	WATER REPELENT COATINGS	1 THRU 2
SECTION	07200	BUILDING INSULATION	1 THRU 2
SECTION	07280	AIR BARRIER	1 THRU 3
SECTION	07311	FIBERGLASS-BASED ASPHALT SHINGLES	1 THRU 7
SECTION	07464	VINYL SOFFIT	1 THRU 3
SECTION	07600	FLASHING AND SHEET METAL	1 THRU 3
SECTION	07651	THROUGH-WALL FLASHING	1 THRU 2
SECTION	07710	PRE-FABRICATED ROOF SPECIALTIES	1 THRU 2
SECTION	07840	FIRESTOPPING	1 THRU 3
SECTION	07900	SEALANTS	1 THRU 3



SECTION 07160

BITUMINOUS DAMPPROOFING

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Liquid Applied Dampproofing and at Exterior Face of Concrete Masonry Units (CMU)

1.02 SUBMITTALS

- A. Submit product literature for all dampproofing materials to Architect for approval in accordance with Section 01300.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Acceptable Manufacturers

1. Karnak Chemical Corp.; #83 Fibrated Dampproofing.
2. W.R. Meadows, Inc. Sealamastic, Semi-Mastic.
3. Sonneborn; Hydrocide Semi-Mastic.

- B. Characteristics: Cold applied, bituminous mastic; brush or spray applied meeting ASTM D4479, Type I.

PART 3 - EXECUTION

3.01 SURFACE PREPARATION

- A. Prior to application, remove dirt, grease, mortar droppings, and other foreign matter from substrate.
- B. Prime wall surfaces prior to dampproofing, as required by manufacturer's product data.
- C. Apply dampproofing at temperatures above 40° F to dry, cured surfaces.

3.02 APPLICATION

- A. Brush or spray apply dampproofing in accordance with manufacturer's product data, at 100 SF per gallon, minimum.
- B. Apply dampproofing to interior of masonry face unless otherwise indicated.

3.03 CLEAN-UP

- A. Protect adjacent finished surfaces from damage or staining from this Work by masking prior to application. Repair or replace surfaces damaged or stained by dampproofing Work.

- B. Remove debris resulting from Work, at completion of dampproofing operations; including spilled materials.

END OF SECTION

SECTION 07190

WATER REPELLENT COATINGS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Penetrating Water Repellent for Exterior Face of Brick

1.02 SUBMITTALS

- A. Submit samples of all waterproofing materials to Architect for approval in accord with Section 01300.
- B. Submit manufacturer's certification that the applicator of penetrating water repellent has been trained and is authorized to install the water repellent treatment, or contact manufacturer for approved applicator list.

1.03 ENVIRONMENTAL REQUIREMENTS

- A. Applicator, install or apply product listed in accordance with manufacturer's requirements.

1.04 DELIVERY AND STORAGE

- A. Deliver materials to job site in manufacturer's original undamaged containers with labels and seals intact.
- B. Store materials in accordance with manufacturer's written requirements.

PART 2 - PRODUCTS

2.01 MANUFACTURER

- A. Sivento, Inc.
220 Davidson Ave
Somerset, NJ 08873-6821
Telephone (800) 828-0919

2.02 MATERIALS

- A. Penetrating water repellent shall be "Aqua-Trete ®" Concentrate weatherproofing. The product shall consist of 100% water miscible silane plus catalyst. The concentrate shall be blended with tap water at the job site in a ratio of 1 part Aqua-Trete per 9 parts water.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify that all surfaces are free of foreign matter, cured, repaired, patched, etc., in accordance with manufacturer's specifications and are ready to receive water repellent.
- B. Verify that concrete has cured a minimum of 28 days.

- C. Verify that the curing of caulking and/or sealing materials is complete.
- D. Repair cracks over 5 mils wide by means of caulking, grouting or tuckpointing.
- E. Repair concrete surfaces with concrete patches that have been allowed to cure a minimum of 28 days.
- F. Cure of tuckpointing shall be a minimum of 3 days.
- G. Clean and prepare surfaces by removing contaminants that would block the pores of the surface. Surface preparation shall be in accordance with manufacturer's requirements.

3.02 APPLICATION

- A. Apply to exterior side of brick veneer and horizontal surfaces in accordance with manufacturers specifications.
- B. Horizontal - Apply using low-pressure (15 psi) spray equipment by ponding it on surface until material takes a minimum of 5 seconds to be absorbed.
- C. Vertical Surfaces - Apply using low pressure (15 psi) spray equipment so it will run down the surface 6 to 8 inches below the spray pattern.
- D. Provide Adequate Ventilation during the application.
- E. Caution should be taken near all glass, metal, asphalt based materials and painted surfaces, since the solvent carrier in the water repellent may attack these materials. Verify with manufacturer materials likely to be attacked by solvent. Mask of all areas, surfaces, landscaping, etc., to avoid contact with overspray.

END OF SECTION

SECTION 07200

BUILDING INSULATION

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Building Thermal Insulation
- B. Thermal Insulation at HVAC grilles
- C. Sound Attenuation Blankets
- D. Related Work Specified Elsewhere:
 - 1. Gypsum Wallboard Systems: Section 09260
 - 2. General Provisions, Mechanical: Section 15010

1.02 QUALITY ASSURANCE

- A. Insulation shall meet or exceed Federal Specifications and ASTM requirements.

1.03 SUBMITTALS

- A. Submit the following information to the Architect for Approval and do not deliver any materials to the job until after approval has been given.
 - 1. Name of manufacturer of material proposed for use in this work.
 - 2. Samples of materials specified in this section.
 - 3. Certifications of R-Value for each type of thickness.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Faced Thermal Batt Type insulation of glass or other inorganic fibers and resinous binders formed into flexible blankets complying with FS HH-I-521 E. Type III, in thickness required for R-Value of 11 (3 1/2"), 21 (5-1/2"), 19 (6") 30 (10") or as specified on drawings and the face type per location as indicated below.

Faced Blanket Type: Class A - reflective foil vapor barrier laminated to one face to be installed at the bottoms of roof trusses. Vapor barrier face to heated space.

Faced Blanket Type: Class B - kraft paper vapor barrier laminated to one face to be installed in concealed spaces such as walls or partitions. Vapor barrier face to heated space.

- B. Furred Wall Insulation:

- 1. 1 1/2" Metal Furring: Furring insulation 1 1/2" "Thermax Sheathing" by Dow Chemical Co.,(R9.8) snugly between furring. Maintain integrity of insulation over entire area to be insulated. Insulate small areas between closely spaced furring

members and carefully cut and/or fit insulation around pipes, conduits and other obstructions.

C. Sound Insulation:

1. In-wall installed sound attenuation blankets, acceptable products:

- a. USG Acoustical Products Co.; Thermafiber Sound Attenuation Fire blankets; paperless, semi-rigid mineral wool fiber blanket. Approved equal - "Paroc" or Owens Corning Sound Attenuation Fire Batts Insulation /MW.

3" thickness at 3 5/8" stud partitions
2 layers of 3" thickness a partitions 6" or wider.

D. Adhesive Tape - as recommended by the insulation manufacturer.

E. Asphaltic Sealant

F. Thermal Insulation at HVAC grilles to be R-19 Faced Blanket Type: reflective foil vapor barrier laminated to one face.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Work shall conform with approved commercial practice, recommendations of insulation manufacturer and these specifications, unless specifically indicated otherwise on the drawings.
- B. All HVAC supply and return air grilles (Not required at exhaust fans) that penetrate ceiling (either acoustical or hard ceilings) to be insulated so as to prevent condensation from occurring at grille. Insulation to be taped and sealed on all sides of supply grille to prevent air above ceiling from coming into contact with grille. Foil backing to face away from grille. Coordinate installation with Ceiling and HVAC Contractors.
- C. Rigid insulation located between furring strip on exterior masonry wall is to be secure to the masonry with a compatible grade adhesive

END OF SECTION

SECTION 07280

AIR BARRIER

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Ceiling/Roof Air Barrier at Bottom of Roof Trusses
- B. Joint Tape and Sealant
- C. Fasteners

1.02 SUBMITTALS

- A. Submit samples of all waterproofing materials to Architect for approval in accord with Section 01300.

1.03 QUALITY CONTROL

- A. Air Barrier shall meet all following minimum standards:
 - 1. Permeance (PERM) - 0.0586 grains/hr/ft² per ASTM E-96.
 - 2. 3" Tensile Strength - 60 lbs/4,500 psi per ASTM D-882.
 - 3. Puncture Strength - 21.4 lb. - per STM D-4833.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Air barrier membrane shall consist of two layers polyethylene reinforced with on layer of heavy-duty cord grid. The product shall be Griffolyn Reinforced Vapor Barriers Type "TX 1200 FR", as manufactured by Reef Industries, Inc. P.O. Box 750250, Houston, Texas 77275-0250, Tel: (800) 231-6074 or approved equal. Standard roll is 20 ft. wide by 200 ft. long but can be ordered in any width at no additional charge. Note: air barrier should be ordered in rolls wide enough to provide a minimum of 4" overlap at all joints.
- B. Self Adhesive Joint Tape (Adhesive on two sides) for field seams and to seal around penetrations to be asphaltic mastic tape a recommended by manufacturer of air barrier membrane.
- C. Self Adhesive Joint Tape (Adhesive on one sides) for repair of holes to be asphaltic mastic tape a recommended by manufacturer of air barrier membrane.
- D. Asphaltic sealant.
- E. Fasteners: 1" staples with 1" diameter plastic washer at 24" O.C. each way or 4d common nails with 1" diameter plastic washer at 24" O.C. each way or 2" long pneumatically applied nails with 1" diameter plastic washers a 24" O.C. each way.

PART 3 - EXECUTION

3.01 PREPARATION

- A. All surfaces must be clean and dry to assure adhesion of tape.
- B. Air Barrier must be install after any insulation that is to be installed at the bottoms of roof trusses and prior to installation of interior walls and partitions.

3.02. INSTALLATION

A. Air Barrier

1. Air barrier shall be hung straight and free of wrinkles or tears.
2. Secure starting end of air barrier roll to vertical perimeter of as described in Paragraph "B" below.
3. Unroll air barrier parallel to trusses. Install first layer of air barrier so the length of the roll is parallel to roof trusses. Temporarily secure manageable length of air barrier with joint tape as required. Provide a minimum of 4" overlap at all ends of air barrier. Install battens parallel to trusses over air barrier at every truss (except truss at joints - see Item No. 4 below) for full length with 4 penny common nails at 12" O.C over top of air barrier.
4. At Joint: Install joint tape over bottom of truss (full length). Temporarily secure first layer of air barrier to bottom of truss at tape. Apply joint tape over first layer of air barrier (full length) already secured to truss. Install end of next run of air barrier over taped location.
5. Continue above process across building.
6. At end of run, secure end of roll to framing perpendicular to roll in a method similar to Item Nos. 3 and 4 above. Seal all "end to end" junctions with joint tape.

B. Air Barrier at Perimeter Walls

1. Exterior Masonry Walls: Install joint tape on vertical face of all masonry walls. Air barrier to lap down and over vertical face (provide a minimum of 4" overlap) Temporarily secure manageable length of air barrier to bottom of trusses and snug to masonry with 1 X 2 P.T. wood batten (fasten to truss or wall over air barrier). Then secure air barrier to previously applied joint tape.
2. Frame Walls: Install joint tape on vertical face of horizontal wood framing (or girder truss). . Air barrier to lap down and over vertical face (provide a minimum of 4" overlap) Temporarily secure manageable length of air barrier to bottom of trusses and snug to masonry with 1 X 2 P.T. wood batten (fasten to truss or wall over air barrier). Then secure air barrier to previously applied joint tape.
3. Provide 1 X 2 P.T. wood batten at all changes of plane.

B. Penetrations & Gaps

1. All gaps, voids, penetrations, etc. must be sealed to provide continuity of air barrier.

2. Penetrations must be wrapped and sealed using asphaltic mastic tape and sealant. Wrap all sides with tape so that air barrier is completely adhered to penetration. Fill all remaining gaps with sealant.
3. Gaps must be sealed with asphaltic mastic tape and sealant as required.

C. Repairs

1. Repairs to air barrier due to damage or abuse to be made with joint tape so that air barrier is completely sealed at repair area. For repair in which bonding of joint tape can not be achieved, provide patch of air barrier material large enough to provide a minimum of 4" coverage on all sides.

D. Access Openings

1. Where access is required to space above air barrier, provide min. 24" X 36" long opening in the air barrier. Upon completion of all work above the air barrier, all access openings are to be infilled with the same air barrier material and sealed per Paragraph "B" above.

END OF SECTION



SECTION 07311

FIBERGLASS-BASED ASPHALT SHINGLES

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Fiberglass Shingles roofing, underlayment, fasteners and flashing.
- B. Related Work Specified Elsewhere:
 - 1. Rough Carpentry: Section 06100
 - 2. Flashing and Sheet Metal: Section 07600
- C. Related Work Elsewhere:
 - 1. Contractor shall review all applicable drawings for work related to roofing, roof penetrations, roof mounted equipment, etc. which may impact roof installation. These drawings include but are not limited to architectural, mechanical, plumbing, lightning protection, electrical, etc.

1.02 QUALITY ASSURANCE

- A. The roofing contractor must be authorized by roofing manufacturer to install specified roofing.
- B. The roofing contractor must furnish written evidence that he is authorized by the roofing manufacturer, when submitting a bid, to install roofing.
- C. The roofing contractor must be trained by the roofing manufacturer and must be familiar with the product.
- D. No deviation shall be made from this specification without prior written authorization from the roofing manufacturer.
- E. Underwriter's Laboratories labels:
 - 1. Class 1
 - 2. Wind Resistant Label
- F. Install Shingles to meet the requirements of the manufacturer.

1.03 DELIVERY, STORAGE AND HANDLING

- A. Deliver all materials to the jobsite in their original, tightly sealed containers or unopened packages with Underwriter's Laboratories Labels.
- B. All materials must be protected from damage during transit, handling, storage and installation.
- C. All materials must be clearly labeled with manufacturer's name and product identifications.
- D. Material other than the roofing material shall be stored in a dry area and protect from the elements.

- E. Damaged materials are to be replaced with new materials.
- F. Store materials on raised platforms and protect with coverings at outdoor locations.
- G. Do not stack bundles of shingles more than 4 ft. high.
- H. Store rolled goods on end.

1.04 PREPARATION AND BUILDING PROTECTION

- A. The building and site shall be protected to prevent damage while work is being performed.
- B. Protection shall be utilized at all hoisting points to protect the building walls.
- C. Provide protection at traffic and walkway areas to protect new and existing construction.
- D. Incomplete membrane edges and flashings shall be protected against water entry so that they will remain watertight for an extended period if inclement weather occurs.
- E. Damaged components must be repaired or replaced, if building damage occurs during construction.

1.05 PROJECT CONDITIONS

- A. This specification is acceptable for use with structures designed to support lightweight roof assemblies. However, the adequacy of the structural support must be verified by the Owner, or the Owner's technical representative. Potential live loads, such as ponding water should be considered.
- B. Do not install underlayment or shingles on wet surfaces.
- C. Do not apply shingles when air temperature is below 40°.

1.06 SUBMITTALS

- A. Submit manufacturer's product data in accordance with Section 01300.

1.07 WARRANTY

- A. Material: Elk 30 year limited warranty transferable, 5-7 year non-perforated coverage, 5 year limited wind warranty 80 mph Wind Resistance Warranty.

PART 2 - PRODUCTS

2.01 GENERAL

- A. Roofing components are to be supplied by specified roofing manufacturer.
- B. Components to be used that are other than those manufactured by the specified roofing manufacturer may be accepted based on chemical compatibility and published performance data. The specifications, installation instructions, limitations and/or restrictions of the respective manufacturers must be closely followed.
- C. Roof Shingles to be "Prestige - High Definition" Class A fiberglass shingle as manufactured by Elk Roofing, 16017 North Florida Ave., Suite 122, Lutz, FL 33549, Tel: 813-769-3722. Shingle color "Sablewood", 13 1/4" x 38 1/4" shingle. Shingle weight - 100 lbs./sq., random laminated tabs.

2.02 ASPHALT COATED UNDERLAYMENT

- A. ASTM D-226-81 fiberglass un-perforated, 36" wide.

2.03 MINERAL SURFACED ROLL ROOFING

- A. For use as starter course or vent flashing and valley application.

2.04 SMOOTH-SURFACED WATERPROOF UNDERLAYMENT

- A. For use with closed valley application.
- B. WeatherWatch waterproof underlayment as manufactured by GAF Corporations, 1361 Alps Road, Wayne, NJ 07470 OR EQUAL.

2.05 HIP AND RIDGE SHINGLES

- A. Pre-cut manufacturer's standard or job-cut except for those noted by the manufacturer that must be factory pre-cut.

2.06 FASTENERS

- A. Hot galvanized or aluminum 11 or 12 ga. barbed shank, 3/8" head, sharp-pointed conventional, of sufficient length to penetrate at least 3/4" into solid decking, or to penetrate through plywood sheathing. NO STAPLES ALLOWED.

2.07 BITUMINOUS PLASTIC CEMENT

- A. SS-C-153C, Type 1, Class A and Type 1, Class B

PART 3 - EXECUTION

3.01 INSPECTION

- A. Assure that surfaces to which shingles are to be applied are uniform, smooth, sound, clean, dry and free of irregularities.
- B. Verify that installation of metal flashing has been completed.
- C. Verify that work of other trades that penetrates roof deck has been completed.
- D. Do not start work until unsatisfactory conditions have been corrected.
- E. Verify all roof insulation has been covered with minimum 3/8" exterior-glue plywood to receive underlayment and shingles.

3.02 APPLICATIONS - UNDERLAYMENT

- A. Decks with slopes 4" in 12" or greater:
 - 1. Fasten metal drip edge along the bottom edge (eaves) before felt is laid and to the sides (rakes) after the felt is laid.

2. Lay one layer of underlayment horizontally over entire roof, lapping each course over lower course 2" minimum at horizontal joints and 4" side lap at end joints.
 3. Lap underlayment 6" from both sides over hips and ridges.
 4. Secure underlayment to deck with sufficient fasteners to hold in place until shingles are applied.
- B. Decks with slope from 2" to less than 4" in 12":
1. Apply two layers of underlayment parallel with eaves, laying first 19" as starter course, overlapping with 36" second layer.
 2. Cover roof with 36" sheets of felt overlapping preceding layer by 19" exposing 17" of underlying sheet.
 3. Secure underlayment to deck with sufficient fasteners to hold in place until shingles are applied.
 4. A continuous layer of plastic asphalt cement is applied at the rate of two gallons per 100 square feet to the surface of the underlay starter course before the first full course is applied, and also to the 19" underlying portion of each succeeding course to a point at least 24" inside the wall line of the building before continuing up on the roof with non-cemented felts. It is important to apply the cement uniformly with a comb trowel, so that a no point will felt touch when the application is completed. The overlying sheet is pressed firmly into the entire cemented area.

3.03 APPLICATION - CLOSED VALLEY FLASHING

- A. A closed cut valley is recommended. Lay a 36" wide smooth surfaced waterproof roof underlayment or ice and water shield type product. Fasten on outer edges only.
- B. Lay all shingles on one side of valley and across centerline of valley a minimum of 12". Fasten a minimum of 6" away from centerline of each side of valley.
- C. Strike a chalk line 2" from the centerline of the unshingled side. Apply shingles on the unshingled side up to chalk-line and trim, taking care not to cut the underlaying shingles. Trim upper corners of these shingles, cement and fasten.
- D. Woven type valleys are an acceptable alternate.

3.04 APPLICATION - STEP FLASHING

- A. Used on the sides of chimneys, dormers, and walls. Cut metal flashing pieces 7" X 10" and bend in half, 7" X 5" each side. Verify flashings sized with manufacturer.
- B. Fasten each flashing piece to the roof at the top edge with two roofing fasteners. Apply shingles on top of metal set in Bituminous Plastic Cement.
- C. To allow for possible roof movement, do not fasten flashing to wall or chimney. Carry a metal cap or wall siding material down over the step flashing.

3.05 APPLICATION - MASONRY WALLS AND CHIMNEYS

- A. Apply shingles up to base of wall or chimney using vertical front wall base flashing in front of wall or chimney and step flashing (covered above) along sides.
- B. For chimneys, cut base per manufacturers recommendations for upper and lower sides. Set in Bituminous Plastic Cement. The lower flashing (only) goes on top of the shingles. For chimneys in the plane of the roof, a cricket should be used at the rear (up slope).
- C. Insert a metal counter flashing into the mortar joint and bend down over the step and base flashing.

3.06 APPLICATION - VENT PIPES

- A. Install nailers at the perimeter of the roof and around all roof projections (unless otherwise shown on roofing manufacturer's standard details).
- B. Nailers shall be firmly anchored to the deck at a maximum of 3'-0" O.C., and shall resist pull out force of 175 lbs./ft. in any direction. A 1/2" vent space shall be provided between adjacent lengths of nailers.
- C. Height of nailers shall match the surface level of insulation and roof membrane.

3.07 APPLICATION - STARTER STRIP/CHALK LINES

- A. Starter Strip
 - 1. Apply 9" minimum wide mineral-surface roll roofing even with lower edge of eaves or use shingles with tabs cut off as a starter strip. Offset first starter shingle 6" so joints of starter do not lie under joints of first course of shingles. Starter strip shingles shall overhang the eaves and rake by 1/2". Fasten starter strip using same spacing as for shingles, and locate fasteners about 3" up from the bottom edge. Avoid fastening where cut-outs will occur on the first course of shingles.
- B. Chalk Lines
 - 1. Snap chalk lines to guide application and maintain level lines parallel with the eaves and ridge.
 - 2. Hip Roofs: Strike vertical chalk line. Apply shingles left and right as described in the application instructions.
- C. Trimming Shingles
 - 1. Gable Roofs: Cut off at rakes allowing 1/2" overhang.
 - 2. Hip Roofs: Cut off even with hips.

3.08 APPLICATION - NAILING/FASTNERS

- A. Standard Fastener Locations: Refer to individual product manufacturer recommendations.
- B. Mansard Steep or in High Wind Areas: For slopes approximately 60° or 21" per foot or higher, six fasteners must be used to secure each shingle. Immediately upon installation, Bituminous Plastic Cement must be used as recommended on shingle bundle wraps.

1. Laminated Overlay Shingles: Place Fasteners in the fastening line, 1" from each side edge, with the remaining four fasteners equally spaced in the fastening line. Avoid fastening where joint in overlaying shingles will occur.
 2. Three-Tab Shingles: Place fasteners 5 5/8" above shingle butt edge, 1" from each side edge and 1" to either side of the two cut-outs.
 3. Overlap Tab Shingles: Place fasteners 5/8" above the cut-out, fasten in center of 4" tab and 1" to either side of the two cut-outs.
- C. Place one spot of shingle tab cement 1" in diameter under each tab immediately upon installation.

3.10 APPLICATION - LAMINATED OVERLAY SHINGLES (13 1/4" X 38 3/4")

- A. End joist must be offset a minimum of 4".
- B. First Course: Start with a full shingle even with the starter course.
- C. Second Course: Offset first shingle 6 1/2".
- D. Third Course: Offset firsts shingle and additional 6 1/2" (13")
- E. Fourth Course: Start with full shingle.
- F. Fifth and Succeeding Courses: Repeat Steps B-E.
- G. For horizontal alignment, place butt of above shingle at top of 5 5/8" cut out.
- H. Fastening Instructions: Place one fastener 1" from each end of shingle and one 13" in from each end, four fasteners in each shingle. All four fasteners must be placed in the fastening line.
- I. Caution must be exercised to assure that end butts (joints) are no closer than 2" from fastener in the shingle below and that side laps are no less than 4" in succeeding courses.

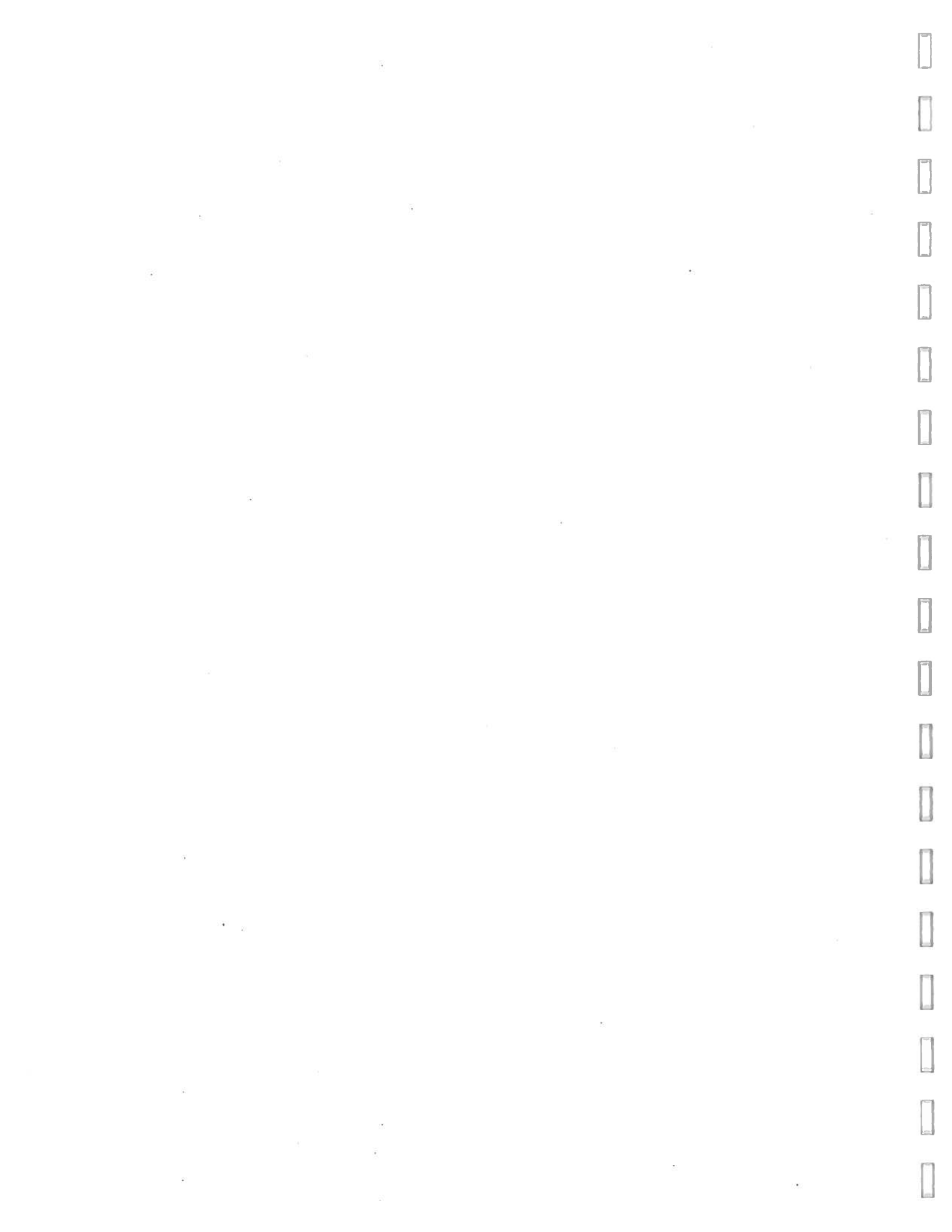
3.11 APPLICATION - LAMINATED OVERLY SHINGLES (14" X 35 5/16")

- A. Random offset of courses is essential for best appearance. End joints must be offset a minimum of 4 1/2".
- B. First Course: Start with a full shingle even with the starter course.
- C. Second Course: Offset second shingle to the 4 1/2" alignment notch in the first course shingle.
- D. Third Course: Offset third shingle to the 7 1/2" alignment notch in the second course shingle.
- E. Succeeding Courses: Continue this pattern, or any combination of these offsets, to achieve a random appearance.
- F. For horizontal alignment, place butt of above shingle at top of 6" horizontal cut out.
- G. Fastening Instructions: Place one fastener 1" from each end of shingle and one 12" in from each end - four fasteners in each shingle. All fasteners placed in fastening line.

3.12 APPLICATION - SQUARE TAB STRIP SHINGLES

- A. Snap chalk lines parallel to the edge (rake) of roof 5 1/2", 11 1/2", 17 1/2", 23 1/2", 29 1/2" and 35 1/2" in from the edge. Horizontal chalk lines should be snapped every other row, 10" apart. Use these guides to keep the shingle cut-outs in alignment during application.
- B. First Course: Start the first course (or row) with a full shingle. Align it to the 35 1/2" chalk line with the butt edge flush with the starter course edge. This will give the required 1/2" overhang on both rake and eaves.
- C. Second Course: Cut 6" off the outside edge of next course and align it to the 29 1/2" chalk line.
- D. Third Course: Cut 12" off the outside edge of next course and align it to the 23 1/2" chalk line.
- E. Succeeding Courses: Repeat this pattern on up the roof, cutting six inches of each succeeding row. When the last piece is installed, which is 6" wide, return to eaves and apply full shingles in each row up the roof. Start the 7th row with a full shingle at the rake, repeating the above pattern. Caution: A cut-out must never come over a cut-out in the row immediately below.
- F. Alternate Offsets of 4" and 5" are also acceptable.
- G. For best distribution of color blend, each row shall be run at least four shingles across the roof before proceeding to the next row.
- H. Fastening Instructions: Place one fastener 1" from each end of shingle and one 12" in from each end, four fasteners in each shingle. All four fasteners must be placed on a line 5 5/8" above the butt edge of the shingle and just below the sealing strip.

END OF SECTION



SECTION 07464

VINYL SOFFIT

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Furnish and install vinyl soffit and accessories as shown on the drawings or as specified herein.
- B. Coordinate this section with interfacing and adjoining work for proper sequence of installation.
- C. Related Work Specified Elsewhere:
 - 1. Rough Carpentry: Section 06100
 - 2. Flashing and Sheet Metal: Section 07600
 - 3. Sealant: Section 07900

1.02 DELIVERY, STORAGE AND HANDLING

- A. All materials must be protected from damage during transit, handling, storage and installation.
- B. All materials must be clearly labeled with manufacturer's name and product identifications.
- C. Damaged materials are to be replaced with new materials.
- D. Store materials on raised platforms and protect with coverings at outdoor locations.
- E. Stack all materials on edge or lay flat on smooth, level surface. Protect edges and corners from chipping. Store under cover and keep dry.

1.03 PROJECT CONDITIONS

- A. Nominal 2 inch X 4 inch wood framing selected for minimal shrinkage and complying with local building codes, including the use of weather-resistant barriers and/or vapor barrier where required. Provide a minimum 1 1/2 inch face and straight, true, of uniform dimensions and properly aligned.
- B. Install weather-resistive barriers and cladding to dry surfaces.
- C. Repair any punctures or tears in the weather-resistant barrier prior to the installation of siding.
- D. Protect siding from other trades.

1.04 SUBMITTALS

- A. Submit manufacturer's product data in accordance with Section 01300.

1.05 WARRANTY

- A. Provide manufacturer's written Lifetime Limited (registered Medallion) product warranty against manufacturing defects, fade and hail damage.

PART 2 - PRODUCTS

2.01 MANUFACTURER

- A. Alcoa Home Exteriors, Inc. Omega Corporate Center, 1590 Omega Drive, Pittsburgh, PA 15205, Tel: (800) 962-6973

2.02 MATERIALS

- A. Siding and Soffit - General Requirements: Polyvinyl chloride products with the following characteristics:

1. Siding: Comply with ASTM D 3679, Class 2.
2. PVC cell classification in accordance with ASTM D 1784: 13334.
3. Coefficient of linear expansion in accordance with ASTM D 696: 0.000029 inch per inch per degree F.
4. Tensile strength when tested in accordance with ASTM D 638: Minimum 7,100 pounds per square inch.
5. Modulus of elasticity when tested in accordance with ASTM D 638: Minimum 360,000 pounds per square inch, average.
6. Izod impact, standard 1/8 inch bar when tested in accordance with ASTM D 256: 3.30 foot-pounds per inch, average.
7. Shore D Hardness: Minimum 73.
8. Specific Gravity: Minimum 1.39.
9. Deflection temperature when tested in accordance with ASTM D 648: 170 degrees F, 264 pounds per square inch.
10. Smoke density rating when tested in accordance with ASTM D 2843: 48 percent, average.
11. Horizontal flammability, when tested in accordance with ASTM D 635:
 - a. Burn distance: 20 mm.
 - b. Burn time: Less than 5 seconds.
12. Surface burning characteristics when tested in accordance with ASTM E 84: Flame spread 20, fuel contribution 0, smoke density 400.
13. Fire Resistance - Siding: 1 hour, when tested in accordance with ASTM E 119, with siding applied over gypsum sheathing.
14. Flammability - Siding: Comply with requirements of UBC Std 26-9.
15. Thermal Resistance when tested in accordance to ASTM C518: "R" Value 3.7.
16. Water Absorption by Immersion in accordance to ASTM C272: 0.5.
17. Density in accordance to ASTM D1622: 1.0.

- B. Fasteners: Aluminum nails, alloy 5056 or 6110, having minimum tensile strength 63,000 pounds per square inch.

- C. Joint Sealers: Specified in Section 07900.

2.03 VINYL SOFFIT AND TRIM

- A. Vinyl Soffit Type: Pro-Bead Soffit.

1. Product Description: Triple 2-2/3 Bead profile, 8 inches exposure, 3/8 inch depth; nominal 0.040 inch material thickness; nominal 12 feet 6 inch piece length.

2. Nailing Hem: Single-row, with elongated nailing holes 1-1/4 inches long at 1-5/8 inches on center.
3. Finish: Low-gloss matte texture.
4. Color: As selected from manufacturer's full range of available colors.
Color: White
6. Supply non-ventilating type soffit material.
7. Pro-Bead Soffit J-Trim: Channel, 2-3/8 inch nailing leg, 1-3/8 inch forward leg, 3/8 inch channel width; Color - White.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine substrate conditions before beginning installation of vinyl products; verify dimensions and acceptability of substrate.
- B. Do not proceed with installation of vinyl products until unacceptable conditions have been corrected.

3.02 INSTALLATION

- A. Install vapor barrier.
- B. Install products in accordance with manufacturer's printed installation instructions.
- C. Attach vinyl products to substrate for weathertight installation; ensure that horizontal components are install true to level, that vertical components are installed true to plumb.
- D. Installation of joint sealers at all joints of vinyl products and between vinyl products and adjacent materials.

3.03 ADJUSTING AND CLEANING

- A. Clean dirt from surface of installed products, using mild soap and water.
- B. After completing installation of vinyl products, remove from project site excess materials and debris resulting from installation of vinyl products.

END OF SECTION



SECTION 07600

FLASHING AND SHEET METAL

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Counterflashing, flashing, crickets, drip edges, gutters & downspouts.
- B. Coordinate the building-in of reglets, expansion joints and flashings.
- C. Related Work Specified Elsewhere:
 - 1. Rough Carpentry: Section 06100
 - 2. Built-Up Bituminous Roofing: Section 07510
 - 3. General Provisions, Mechanical: Section 15010
 - 4. General Provision, Electrical: Section 16010
- D. Related Work Elsewhere:
 - 1. Contractor shall review all applicable drawings for work related to roofing, roof penetrations, roof mounted equipment, etc. which may impact roof installation. These drawings include but are not limited to architectural, mechanical, plumbing, lightning protection, electrical, etc.

1.02 QUALITY ASSURANCE

- A. Work shall be performed in conformance with approved commercial practice, recommendations of S.M.A.C.N.A. and these specifications, unless specifically indicated otherwise on the drawings.
- B. Materials shall meet or exceed requirements of the Federal and American Society for Testing Materials, and these specifications

1.03 SUBMITTALS

- A. Submit shop drawings, cuts and manufacturer's data on standard commercial items. Indicate the method of fabrication and installation, expansion joints and fastening.
- B. Submit two (2) samples each of all types and sizes of nails, screws, bolts, brackets, cleats, and other fastenings for approval and state where each type is to be used. Also submit two (2) twelve (12") inch long samples of leaders (downspouts), and reglets.

1.04 GUARANTEE

- A. Maintain sheet metal work in a weathertight and watertight condition for a period of two (2) years from date of acceptance by the Owner, except repairs of failure resulting from causes other than ordinary wear and tear from the elements.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Flashing and all sheet metal items to be aluminum, gauge at follows:

Width of any single section of metal (un-bent)

0" to 10"	.025"
10" to 14"	.032"
Over 14"	.040"

- B. Bituminous Plastic Cement, SS-C-153.
- C. Bituminous Paint, Military Spec. Mil-P-6883.
- D. Paper, UU-P-191, Type IV, Class B.
- E. Felt HH-F-191, Type 1.
- F. Resin sized paper shall be smooth unsaturated building paper weighing no less than five (5) pounds per square foot.
- G. Nails, Screws, bolts, expansion shields and other fastenings shall be of same materials as sheet metal to be secured or shall be durable compatible materials which are regularly recommended for the metal. Nails shall be #10 gauge (.1019" diameter) or larger, needlepoint and long enough to penetrate wood one inch. Rivets shall be 1/8" in diameter or larger.
- H. Asphalt Varnish - TT-V-51.
- I. Cleats shall be two (2) inches wide and continuous and of the same material, and not less in thickness than sheet metal being installed.
- J. Eave Treatment
 - 1. Drip Edge - 1 1/2" X 2" .04 ALUMINUM metal drip - Field Paint to Match Metal roof. See Details.
 - 2. Continuous Cleat - 1 1/2" X 2" .04 ALUMINUM metal drip - Field Paint to Match Metal roof. See Details.
- K. Wall Flashing and Counter Flashing
 - 1. .04 ALUMINUM sizes and shapes as show on drawings. Field Paint to match siding. See Details.
- L. Gutter: 6" gutters (shape as shown on drawings) with outlet tubes to accommodate downspouts and 1/8" x 1" flat stock aluminum hangers.
- M. Downspouts: 3"x 4" aluminum with elbows as required.
- N. Downspout Hangers: 1/16" X 1" aluminum flat stock.
- O. Valley Flashing: 24 ga. G90 galvanized 18" wide (each side) - minimum.

PART 3 - EXECUTION

3.01 INSPECTION

- A. Inspect all surfaces to which sheet metal or sheet metal accessories are to be installed, and do not install sheet metal work unless such surfaces are sound, dry, clean and free of

defects which might be deleterious to the sheet metal work. Drive projecting nails flush with deck.

3.02 INSTALLATION

- A. Confine direct-nailing to sheet metal less than twelve (12") wide. Use cleats on sheet metal wider than twelve (12") wide.
- B. Install underlayment (felt and paper, or paper) as recommended by the sheet metal manufacturer of the type of deck work involved.
- C. Lock one end of cleats into seams and folded edges; nail other end with two nails and fold back over nail heads. Cleats to be continuous except where noted. Spaced cleats (where allowed) to be spaced not over twelve (12") inches on centers.
- D. Make joints mechanically with filler. All sheet metal work shall be functionally weathertight and watertight.
- E. Insulate between dissimilar metals with one of the following: Bituminous paint, one coat primer and one coat aluminum paint, caulking compound, bituminous plastic cement, asphalt varnish, or approved non-absorptive tape or gasket. Resistance across insulated finish joint shall exceed 500,000 ohms.
- F. Finish installation shall be true to line with shop formed shapes undistorted, not damaged, and with properly shaped angles, and with plain surface free from waves and buckles.
- G. Apply bituminous paint to all copper surfaces before placing in contact with masonry, concrete or other corrosive metal.
- H. Install expansion joints in all sheet metal work at maximum of 12'-0" O.C. Expansion joints shall be slip type with concealed splice plate and single exposed vertical joint. Provide twelve (12") long aluminum back-up plate nailed in place. Install with 1/4" expansion gap. Provide six (6") inch long top cover plate overlapping face four (4") inches.
- I. Install prefabricated reglets as per S.M.A.C.N.A. and manufacturer's recommendations.
- J. Pre-tin edges of sheet metal before soldering. Sweat width of seams full of solder. Use recommended flux just prior to soldering. Remove exposed flux after work is soldered. Lap seams in direction of flow. Make seams not smaller than the following: standing 1" flat lock 3/4"; soldered lap 1"; unsoldered filled flat 3". All sheet metal work shall functionally weathertight and watertight.

3.03 FINISH

- A. All exposed aluminum metal drip edges to be pre-painted painted "White". Wall mounted flashing and counter flashing to be painted to match adjacent finished materials, (i.e. stucco, brick, etc.)
- B. Roofing contractor to coordinated Painting Contractor.

END OF SECTION



SECTION 07651

THROUGH-WALL FLASHING

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Thru-Wall Flashing
- B. Related Work Specified Elsewhere:
 - 1. Cast-In-Place Concrete: Section 03300
 - 2. Mortar: Section 04100
 - 3. Structural Steel: Section 05120
 - 4. Flashing and Sheet Metal: Section 07600

1.02 SUBMITTALS

- A. Submit samples of all through-wall flashing materials to Architect for approval in accord with Section 01300.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Thru wall flashing shall be a combination consisting of a sheet of electrolytically deposited copper bonded with asphalt to a sheet of lead and this assemblage bonded on one side to a fiberglass reinforced creped kraft backing. Total metal weight to be three (3) ounces. Thru-wall flashing to be AFco Cop-A-Lead Bond as manufactured by AFco Products, Inc., 44 Park Street, Somerville, Massachusetts 02143, Tel: (617) 623-7700.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Thru-Wall Flashing
 - 1. All surfaces to receive the flashing shall be reasonably smooth, free from irregularities. On all horizontal surfaces the flashing shall be laid either in a fresh bed of mortar above and below or a trowel coat of mastic. Vertical surfaces shall be spotted with asphalt mastic to hold flashing in place.
 - 2. Heads and Sills: Flashing shall start 1/16" from outside face of wall, then thru the wall turning up at the inside not less than 2" (or as indicated on the drawings) and extend 6" on each side of opening. It shall be turned at the ends forming a 2" deep pan running entirely thru the wall.
 - 3. Thru-Wall: Flashing shall start 1/16" from the outside face of the wall, then go thru wall turning up at the inside not less than 2" (or as indicated on the drawings).

END OF SECTION



SECTION 07710

PREFABRICATED ROOF SPECIALTIES

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Furnish and Install Prefabricated Louvered Metal Dormer
- B. Related Work Specified Elsewhere:
 - 1. Roof Tiles (Mechanically Fastened): Section 07320

1.02 QUALITY ASSURANCE

- A. Work shall be performed in conformance with approved commercial practice, recommendations of S.M.A.C.N.A. and these specifications, unless specifically indicated otherwise on the drawings.
- B. Materials shall meet or exceed requirements of the Federal and American Society for Testing Materials, and these specifications.
- C. The coping contractor must be authorized by coping manufacturer to install specified coping.
- D. The coping contractor must furnish written evidence that he is authorized, by the coping manufacturer, when submitting a bid to install coping.
- E. The coping contractor must be trained by the coping manufacturer and must be familiar with the product.

1.03 SUBMITTALS

- A. Submit shop drawings, cuts and manufacturer's data on standard commercial items. Indicate the method of fabrication and installation, expansion joints and fastening in accordance with Section 01300.
- B. Submit two (2) samples each of all types and sizes of brackets, cleats, adhesive, chairs and other fastenings for approval and state where each type is to be used. Also submit two (2) twelve (12") inch long samples aluminum coping.

1.04 WARRANTY

- A. Provide manufacturer's standard warranty.

PART 2 - PRODUCTS

2.01 MANUFACTURER

- A. The Prefabricated Louvered Metal Dormer to be a half round model, 48" wide by 24" high for 6:12 roof pitch as manufactured by CopperCraft, Inc. 4995 Keller Haslet Road, Keller, Texas, 76244, Tel: (800) 486-2723 or equal.

- B. Louver Material: .032 aluminum
- C. Louver Color: Factory Painted - "Regal White"

PART 3 - EXECUTION

3.01 INSPECTION

- A. Inspect all surfaces to which metal or metal accessories are to be installed, and do not install sheet work unless such surfaces are flat, sound, dry, clean and free of defects which might be deleterious to the metal work.

3.02 INSTALLATION

- A. Install all dormers per the standards set forth in the Sheet Metal and Air Conditioning Contractors National Association , Inc. Manual (SMACNA).

END OF SECTION

SECTION 07840

FIRESTOPPING

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Installation of firestopping materials at openings and voids in, or at periphery of fire-rated construction.
- B. Related Work Specified Elsewhere:
 - 1. Sealants: Section 07900
 - 2. General Requirements, Mechanical: Section 15000

1.02 REFERENCES

- A. ASTM E 814 Fire Test of Through-Penetration Fire Stops UL 1479 Fire Test of Through-Wall firestops.
- B. UL Building Materials Directory: Through-Penetration Firestops Systems (XHEZ), and Fill, Void or Cavity Materials (XHHW).

1.04 DEFINITIONS

- A. Firestopping: A Material, or combination of materials, to retain the integrity of time-rated construction by maintaining an effective barrier against the spread of flame, smoke and gases. It shall be used in specific locations as follows:
 - 1. Duct, cables, conduit, and piping penetrations through floor slabs and through time-rated partitions of firewalls.
 - 2. Openings and penetrations in time-rated partitions of firewalls containing fire doors.
 - 3. Locations where specifically shown on drawings or where specified in other sections of this specification.

1.05 QUALITY ASSURANCE

- A. Submit manufacturer's product data, letter of certification, or certified laboratory test report that the material or combination of materials meet the requirements specified in ASTM E 814 and are so classified in UL's Building and Materials Directory.

1.06 SUBMITTALS

- A. Submit shop drawings, product data, certificates, and manufacturer's installation instructions to the Architect for approval in accord with Section 01300.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Firestopping Materials:

1. Electrical Products Division/3M, St. Paul MN 55114.

B. Firestop Devices:

1. International Protective Coatings, Corp. 725 Carol Ave., Oakhurst, NJ 07755.
2. Electrical Products Division/3M, St. Paul MN 55114.

2.02 FIRESTOPPING

A. Firestopping materials/construction shall constitute one or more of the following products:

1. 3M Brand Caulk CP-25 WB+
2. 3M Brand Putty MPS-2+
3. 3M Brand Wrap/Strip FS-195
4. 3M Brand Composite Sheet CS-195
5. 3M Brand Penetrating Sealing Systems 7900 Series
6. International Protective Coatings - FSD Device.
7. Misc. bolts and washers for securing straps.
8. Those products compatible with the above materials as certified by 3M and International Protective Coating Corp. in their published data.

B. Firestopping material shall be asbestos-free and capable of maintaining an effective barrier against flame, smoke, and gases in compliance with the requirements of ASTM E 814 and UL 1479.

C. Firestopping Device: Galvanized steel collar lined with intumescent material sized to fit the specific diameter of the through-penetrant. Device shall be installed .

2.03 MISCELLANEOUS ACCESSORIES

- A. Polyethylene backer rod.
- B. Mineral wool batt or glass fiber insulation.
- C. Galvanized steel straps.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Clean surfaces to be in contact with firestopping materials of dirt, grease, oil, loose materials, rust, or other substances that may affect proper fitting or the required fire resistance.

3.02 INSTALLATION

- A. Install firestopping materials as indicated on drawings, in accordance with manufacturer's instructions
- B. Seal all holes or voids made by penetrations to ensure an effective smoke barrier.
- C. Unless protected from possible loading or traffic, install firestopping materials in floor having void openings of four (4) inches or more to support the same floor load requirements.
- D. See drawings for U.L. Listed penetration assemblies, methods of construction, and for different types of materials.

3.03 FIELD QUALITY CONTROL

- A. Examine firestopped areas to ensure proper installation prior to concealing or enclosing firestopped areas.
- B. Areas of work shall remain accessible until inspection (and approval) by applicable code authorities.

END OF SECTION



SECTION 07900

SEALANTS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Provide and apply all sealants and caulking as required by the drawings and specified herein, and all materials, incidentals, and equipment required to complete this work.
- B. Related Work Specified Elsewhere:
 - 1. Unit Masonry: Section 04200
 - 2. Finish Carpentry: Section 06200
 - 3. Cabinetwork: Section 06410
 - 4. Fiberglass Roof Shingles: Section 07311
 - 5. Flashing and Sheet Metal: Section 07600
 - 6. Metal Doors and Frames: Section 08100
 - 7. Wood Door: Section 08210
 - 8. Panel Folding Doors: Section 08351
 - 9. Entrances and Storefronts: Section 08400
 - 10. Painting: Section 09900
 - 11. General Provisions, Mechanical: Section 15010

1.02 QUALITY ASSURANCE

- A. Materials shall meet or exceed requirements of the Federal Society of Testing Materials and these specifications.

1.03 SUBMITTALS

- A. Samples of all materials specified in this section shall be submitted to Architect for approval in accordance with Section 01300.

1.04 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Materials shall be delivered to job site in sealed containers with manufacturer's original labels attached and accompanied by certification of compliance with specifications.
- B. Materials shall be stored and used in strict accordance with manufacturer's printed instructions.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Exterior Non-Painted Surfaces
 - 1. Porous to Porous Materials
 - a. G.E. Silpruf Silicone Sealant
 - b. Dow Corning 790 Silicone Building Sealant
 - c. Precora 864

2. Porous to Non-Porous Materials
 - a. G.E. Silpruf Silicone Sealant
 - b. Dow Corning 790 Silicone Building Sealant
 - c. Precora 864
3. Non-Porous to Non-Porous Material
 - a. G.E. Silpruf Silicone Sealant
 - b. Dow Corning 999 Silicone Building and Glazing Sealant
 - c. Precora 863
- B. Exterior Painted Surfaces (all surfaces)
 1. Tremco Dymeric 240 - Low Modulus Expansion Joint Sealant.
- C. Interior (all surfaces)
 1. Sonneborn-Sonolac
 2. Pecora AC 20 Acrylic Latex (one part)
 3. Tremco Acrylic Latex (one part)
- D. Acoustical Sealant
 1. Tremco Acoustical Sealant
- E. Plumbing Fixture Sealant
 1. Dow Corning 786 Silicone Sealant
 2. G.E. Sanitary 1700
- F. Pour Grade Sealant
 1. Sonneborn Sonolastic SL1 Sealant
- G. Joint backing where indicated, shall be closed cell, polyethylene linear, round or square shape, and shall be non-staining, non-absorbent and capable of at least 30% recovery.
- H. Color of sealant or caulking shall be selected by the Architect.
- I. Metal Roofing Sealant: Non-skinning Butyl sealant "Butyl Sealant No. 611" as manufactured by Superior Polymer Products, 4525 Renaissance Rd., Calumet MI 49913, Tel: (906) 337-3355 or approved equal - color to be selected by Architect.

PART 3 - EXECUTION

3.01 INSPECTION

- A. Examine all surfaces prior to application and notify General Contractor and Architect of all conditions detrimental to satisfactory application.

3.02 PREPARATION

- A. All joints or channels shall be cleaned and free of dirt, oil grease, moisture, loose mortar, or other foreign matter.
- B. Metal surfaces shall be wiped with Xylol or MEK and then dried.

- C. Masonry surfaces shall be cleaned with wire brush and then blown clean. All dampproofing treatments contaminating the joint must be completely removed.

3.03 APPLICATION

- A. All sealants shall be applied by skilled applicators in accordance with manufacturer's instructions.
- B. Work shall be of the highest quality and in compliance with specifications. Upon completion all joints shall be water and weathertight.
- C. Apply sealant with hand gun or air gun under sufficient pressure and through nozzle openings of such a diameter so that a full bead of sealant is run into the joint and fills the opening completely and with a slightly convex surface. Sealant shall make firm and full contact with both adjacent members being sealed and for full depth of joint recess.
- D. Primers recommended by manufacturer shall be used with sealant where required.
- E. Joints more than 3/4" deep and joints where suitable backstop has not been provided shall be packed with joint backing to within 1/2" of surface, before applying sealant. Size of joint backing shall be large enough so it must be compressed approximately 30% before inserting into the joint.
- F. Remove all excess materials and smears adjacent to the joint as work progresses and leave surfaces neat, smooth and clean. Upon completion, sealant shall have a smooth even finish.

END OF SECTION



DIVISION 8 DOORS AND WINDOWS

SECTION	08100	METAL DOOR FRAMES	1 THRU 4
SECTION	08200	FIRE RATED WOOD DOOR FRAMES	1 THRU 2
SECTION	08210	WOOD DOORS	1 THRU 3
SECTION	08305	ACCESS DOORS	1 THRU 1
SECTION	08400	ENTRANCES AND STOREFRONTS	1 THRU 4
SECTION	08520	ALUMINUM WINDOWS	1 THRU 4
SECTION	08584	VINYL SHUTTERS	1 THRU 1
SECTION	08710	FINISH HARDWARE	1 THRU 8
SECTION	08800	GLASS AND GLAZING	1 THRU 3



SECTION 08100

METAL DOOR FRAMES

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Metal Door Frames
- B. Anchoring Devices
- C. Related Work Specified Elsewhere:
 - 1. Masonry: Section 04200
 - 2. Rough Carpentry: Section 06100
 - 3. Finish Carpentry: Section 06200
 - 4. Sealants: Section 07900
 - 5. Finish Hardware: Section 08710
 - 6. Glazing: Section 08800
 - 7. Painting: Section 09900

1.02 SUBMITTALS

- A. Shop drawings and manufacturer's data shall be submitted on all materials specified in this section.

1.03 STORAGE AND HANDLING

- A. All frames and doors shall be stored on the job so that they are protected against dampness, rusting and other damage. Any rusted or damaged frames and doors will be subject to rejection.

1.04 REFERENCES

- A. Door and Hardware Preparation - ANSI 115
- B. Steel Door Institute - ANSI/SDI-100 (Latest Edition)

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Ceco Door Products, 9159 Telecom Drive, Milan, TN 38353 or approved equal.

2.02 HARDWARE LOCATIONS AND GENERAL REQUIREMENTS

- A. Locate hardware on doors and frames in accordance with manufacturer's standard location.
- B. When steel frames are used with wood doors, the hardware preparation in the door is governed by the location on the frame. If the doors are factory mortised, the door supplier is responsible for coordinating hardware locations.
- C. Hardware reinforcements are to be in accordance with the minimum standard gauges as listed in S.D.I. 100.

- D. Doors shall be mortised, reinforced and function holes provided at the factory in accordance with the hardware schedule and templates, provided by the hardware supplier. Through bolt holes, attachment holes, or drilling and tapping for surface hardware shall be done in the field.

2.03 FRAMES

- A. Model: "SQ" Equal Rabbet Frame
- B. Interior Frames to be cold rolled steel complying with ASTM A366 or A620.
- A. Exterior Frames and frames at interior toilet rooms, janitors closets, or other "wet" areas to be hot dipped zinc coated (G90) complying with ASTM designations A924 A60.
- D. Frames for standard doors shall be fabricated with 16 gauge steel, with 2" face with 1/2" integral stops. Head corners shall be neatly mitered and welded continuously. Frames shall be mortised for 4-1/2" X 4-1/2" hinges and die cut for specified lock strikes. Dust boxes shall be provided for hinge and lock for the wall construction involved plus floor anchor. Provide three(3) silencers at each frame.
- E. Frames for labeled doors shall be of the depth shown of 16 gauge steel, with 2" face. Frames shall be constructed to meet requirements of Underwriters Laboratories and shall be so labeled. Frames shall be mortised and reinforced with lock strikes and shall have dust covers. Provide three (3) silencers per frame. Frames shall have Warnock Hersey or Underwriters Laboratories label attached.
- F. Frames for fixed windows shall be of the depth shown on the details of 16 gauge steel with 2" faces and 1/2" integral stops. All corners shall be neatly mitered and welded continuous.
- G. Fabrication
 - 1. Provide steel frames for doors, transoms, sidelights, borrowed lites, and other openings to the size and design as shown on the architectural drawings.
 - 2. All finished work shall be strong and rigid, neat in appearance, square, true and free of defects.
 - 3. Jamb depths, trim profiles and backbends to be as scheduled and shown on the approved shop drawings.
 - 4. When shipping limitations dictate, frames for large openings are to be fabricated in sections for splicing or splining in the field by others.
 - 5. Hardware reinforcements shall be in accordance with the minimum standard gauges as listed in S.D.I. 100.
 - 6. Frames shall be mortised, reinforced, drilled and tapped at the factory for template mortised hardware only, in accordance with approved hardware schedule and template provided by the hardware contractor. Where surface mounted hardware is to be applied, frames shall have reinforcing plates only, all drilling and tapping to be done in the field by others.
 - 7. Hinge reinforcements to be 7 gauge steel.

H. Anchors

1. Interior: Three (3) jamb anchors and one (1) floor anchor are to be provided at each jamb.
2. Exterior: Jamb anchors at 16 inches on center vertically and one (1) floor anchor are to be provided at each jamb.
3. Anchors in masonry walls are to be either wire type or "t" type plate.
4. Anchors for stud partitions to be steel of suitable design, not less than 18 gauge thickness.
5. Dust boxes/mortar guards to be not less than 26 gauge.
6. All frames that are to be welded are to have a steel spreader during shipping and handling. Spreader bars are for bracing only and are not to be used to size the frame opening.
7. Loose glazing stops are to be of 16 gauge galvanized steel, butted at corner joints and secured to the frame with countersunk cadmium or zinc-plated screws.
8. Except on weather stripped-stripped frames, punch the stop for 3 silencers (except where noted on the hardware schedule) on single door and 2 on double door frames.

2.04 PRIME FINISH

- A. Door frames are to be cleaned, and chemically treated to insure maximum finish paint adhesion. All surfaces of the door and frame shall receive a factory applied coat of rust inhibiting primer. The finish to meet the requirements for acceptance stated in ANSI A224.1 "Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces". The prime finish is not intended to be the final layer of protection from the elements. Field painting - see Paint Code Schedule on drawings.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Frames:

1. Prior to installation, all frames must be checked for rack, twist, and out of square conditions
2. Place frames prior to enclosing walls and ceiling. Set frames accurately in position, plumb and braced securely until permanent anchors are set. Remove shipping bar spreader and insert a wood spreader cut to the opening width, notched to clear the stops.
3. Fill frames in masonry wall with mortar.
4. When temperature conditions necessitate an additive in the plaster or mortar to prevent freezing, the contractor installing the frames shall coat the inside of the frames, in the field, with a corrosion inhibiting bituminous material.

5. S.D.I. 105, "Recommended Erection Instructions for Steel Frames" and S.D.I. 110 "Standard Doors and Frames for Modular Masonry Construction " shall indicated the proper installation procedures.

- B. Hardware templates must be applied in accordance with hardware manufacturer's templates and instructions.

3.03 ADJUST AND CLEAN

- A. Check and re-adjust operating finish hardware items in hollow metal work just prior to final inspection. Leave work in complete and proper condition.
- B. Immediately after erection, sand smooth any rusted or damaged areas of prime coat and apply to touch-up or compatible air-drying primer.

END OF SECTION

SECTION 08200

FIRE RATED WOOD DOOR FRAMES

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Fire Rated Wood Door Frames.
- B. Related Work Specified Elsewhere:
 - 1. Rough Carpentry: Section 06100
 - 2. Sealants: Section 07900
 - 3. Finish Hardware: Section 08710
 - 4. Gypsum Wallboard System: Section 09260
 - 5. Painting: Section 09900

1.02 SUBMITTALS

- A. Shop drawings and manufacturer's data shall be submitted on materials specified in this section in accordance with Section 01300.

1.03 STORAGE AND HANDLING

- A. All doors frames shall be stored on the job so that they are protected against dampness, warping and other damage. Any warped or damaged will subject to rejection.

1.04 GUARANTEE

- A. All door frames shall carry a one-year guarantee against defects in materials and workmanship.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Fire Rated Wood Door Frames
 - 1. Pre-engineered door and glazing frames and millwork components where so indicated on the architectural drawings, shall be manufactured by Walker Brothers Millwork, Inc., 12800 West Colonial Drive, Winter Garden, FL 34787, (407) 656-2430.
 - 2. Frames profile shall be as indicated on the drawings.
 - 3. All components shall be full profile sanded.
 - 4. Frame Material: Poplar
 - 5. All exposed edges shall be relieved with a 1/4" radius.
 - 6. All corners shall be factory mitered and dowelled to eliminate any lateral movement at joints.

7. Frames shall be factory pre-machined for hardware as specified.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Work shall be performed in conformance with good trade practice, recommendations of manufacturer and these specifications unless specifically indicated otherwise on the drawings.
 1. Protect materials against dampness and other damage during and after delivery and installation.
 2. Install frames plumb and true and anchor securely in wall using at least three (3) anchors plus floor anchor for each jamb.

END OF SECTION

SECTION 08211

WOOD DOORS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Wood Doors
- B. Related Work Specified Elsewhere:
 - 1. Rough Carpentry: Section 06100
 - 2. Sealants: Section 07900
 - 3. Metal Doors Frames: Section 08100
 - 4. Finish Hardware: Section 08710
 - 5. Gypsum Wallboard System: Section 09260
 - 6. Painting: Section 09900

1.02 QUALITY ASSURANCE

- A. Allowable color and grade variation: Select doors for natural finish, for uniformity of color, and grain, and inconspicuous joints in face veneers. Provide adjacent doors and doors viewed together with similar color and grain.
- B. Grade markings: Provide each door with stamp, brand, or label which identifies manufacturer, trade association of which he is member, grade and type of door, or industry standard with which it complies.
- C. All doors shall meet or exceed quality certification of the National Woodwork Institute, ANSI, and National Wood Window and Door Association (NWWDA)

1.03 SUBMITTALS

- A. Shop drawings and manufacturer's data shall be submitted on materials specified in this section in accordance with Section 01300.

1.04 STORAGE AND HANDLING

- A. All doors shall be stored on the job so that they are protected against dampness, warping and other damage. Any warped or damaged doors will subject to rejection.

1.05 GUARANTEE

- A. All Hollow Core doors shall carry a one-year guarantee by NEMA. All solid core doors shall have a lifetime guarantee for interior use - 2-year guarantee for exterior use.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Wood Panel Doors as manufactured by Simpson Door Co., 400 Simpson Ave., McCleary WA, 98557, Tel: 800-952-4057 or approved equal.
 - 1. Door Name: ENCORE 8523

2. Door Number: 8523
 3. Door Series: Encore
 4. Door Type: Interior Panel
 5. Number of Panels: 3
 6. Thickness: 1 3/4"
 7. Construction: 1/3/4" thickness.
 8. Finish: Factory Primed
- B. Fire Rated Solid Core Flush Doors as manufactured by Simpson Door Co., 400 Simpson Ave., McCleary WA, 98557, Tel: 800-952-4057 or approved equal.
1. Type: Meeting NWDA I.S. 1-86, Grade I, Type I
 2. Construction: Mineral core, 1/3/4" thickness without applied trim (2 1/4" with applied trim.
 3. Face Veneers: Fir/Hemlock
 4. Edge bands and molding: To match face veneer.
 5. Adhesive: Meeting Commercial Standard CS-171, Type II
 6. Label: UL or WHI 20 minute or 3/4 hour (where noted on Door Schedule).
 7. Finish: Factory Primed
- C. Wood Louvered Doors
1. Type: Meeting AWI standards for a custom grade architectural quality door
 2. Stiles & Rails Thickness: 1 3/4"
 3. Louver: Full Louvered
 4. Stiles & Top Rails: 5" Face before pre-fit
 5. Cross Rails & Mulls: 3" Face
 6. Lock Rails: 6" Face
 7. Bottom Rails: 10" Before undercut
 8. Species: Paint Grade Poplar Or Pine
 9. Edge bands and molding: To match face veneer.
 10. Adhesive: Meeting Commercial Standard CS-171, Type II
- D. Wood Door with Full Glass Panel
1. Door Name: Red-Prime 8001
 2. Door Number: 8001
 3. Door Series: Redi-Prime
 4. Door Type: Interior Panel
 5. Number of Panels: 1
 6. Panel Type: Full Glass - 1/4" Tempered
 7. Thickness: 1 3/4"
 8. Construction: 1/3/4" thickness.
 9. Finish: Factory Primed

3.01 INSTALLATION

- A. Work shall be performed in conformance with good trade practice, recommendations of manufacturer and these specifications unless specifically indicated otherwise on the drawings.
1. Protect materials against dampness and other damage during and after delivery and installation.
 2. Fit doors plumb with 1/8" clearance at head and jambs and 1/8" clearance at threshold, also doors shall clear floors by 1/2". Adjust hardware so doors work

properly. Use screwdriver to drive screws. Leave doors clean, smooth and ready for finishing.

END OF SECTION



SECTION 08305

ACCESS DOORS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Recessed Access Doors
- B. Anchoring Devices.
- C. Related Work Specified Elsewhere:
 - 1. Rough Carpentry: Section 06100
 - 2. Light Gauge Metal Framing: Section 05400
 - 3. Painting: Section 09900

1.02 SUBMITTALS

- A. Shop drawings and manufacturer's data shall be submitted on materials specified in this section in accordance with Section 01300.

1.03 STORAGE AND HANDLING

- A. All doors shall be stored on the job so that they are protected against dampness, rusting and other damage. Any rusted or damaged doors will subject to rejection.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Access doors in vertical parapet a roof (between trusses) Shall be Style "B-NT" as manufactured by Babcock-Davis, 1701 Madison Street NE, Minneapolis, MN 55413-1400, Tele: (888) 412-3726 or Approved Equal. Access door to be 22" wide by 30" high.
- B. Frames shall be 16 gauge steel and doors shall be 18 gauge steel.
- C. Hinge: Concealed Pivot type.
- D. Locks shall be flush to finish surface, key operated cylinder lock with automatic dust shutter.
- E. Finish shall be prime coat of rust inhibitive baked gray enamel.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Install doors plumb and true and anchor securely in accordance with manufacturer's specifications.

END OF SECTION



SECTION 08400

ENTRANCES AND STOREFRONTS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Aluminum Entrances, Aluminum Storefront Doors and Aluminum Storefront Frames.
- B. Storefront Door Hardware.
- C. Anchoring Devices.
- D. Related Work Specified Elsewhere:
 - 1. Rough Carpentry: Section 06100
 - 2. Sealants: Section 07900
 - 3. Finish Hardware: Section 08710
 - 4. Glass and Glazing: Section 08800

1.02 QUALITY ASSURANCE

- A. All Aluminum sections shall be extruded from 6063-T5 Aluminum alloy (A.S.T.M. B221-54T alloy GA 10A-T5).

1.03 SUBMITTALS

- A. Shop drawings shall be submitted in accordance with Section 01300.
- B. Submit samples of storefront, glazing, manufacturers data, testing reports, warranties, etc.

1.04 PRODUCT CONDITIONS/SITE CONDITIONS

- A. Field Measurements: Verify actual measurements/openings by field measurements before fabrication. Show recorded measurements on shop drawings. Coordinate field measurements, fabrication schedule with construction progress to avoid construction delays.

1.05 WARRANTY

- A. Project Warranty: Refer to Section 00810 Supplementary General Conditions for project warranty provisions.
- B. Manufacturer's Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty document executed by authorized company official. Manufacturer's warranty is in addition to and not a limitation of other rights Owner may have under Contract Documents.
 - 1. Beneficiary: Issue warranty in the legal name of the project Owner.
 - 2. Warranty Period: 2 years commencing from the Date of Substantial Completion.

3. Warranty Acceptance: Owner is sole authority who will determine acceptability of manufacturer's warranty documents.

PART 2 - PRODUCTS

2.01 SINGLE SOURCE

- A. It is the intent of this specification to have a single source responsibility for the supply of the aluminum doors and framing systems on this project. Any deviation for the acceptable manufacturers listed below must be approved in writing by the architect at least ten (10) days prior to bid date. See architect's product substitution form.

2.02 MATERIALS

- A. Framing members shall be extruded sections. Framing shall be TriFab VG 450 as manufactured by Kawneer. Approved equal - Vista, or YKK. Shape, size and design as shown on drawings.

Provide thermoplastic elastomer weatherstrip in the blade stop of frame jambs, headers, and transom bars at all doors, interior and exterior (except at dual acting doors).

- B. Extrusions: ASTM B 221 (ASTM B 221M), 6063-T5 Aluminum alloy.
- C. Bolts, screws and miscellaneous fasteners shall be stainless steel Class 304 and 305.
- D. Aluminum entrance door shall be fabricated to details and dimensions shown. Door and frames shall be extruded aluminum not less than .125 inch in thickness. All fastening shall be concealed. Complete weatherstripping shall be provided on all edges, including meeting stiles. Doors shall be narrow stile 190 as manufactured by Kawneer or approved equal.

2.03 HARDWARE

THE FOLLOWING ARE HARDWARE REQUIREMENTS RELATED TO DOOR FUNCTION. TYPES, NOT ALL TYPES MAY BE APPLICABLE. SEE SECTION 08710 - FINISH HARDWARE FOR DOOR FUNCTIONS TYPES TO BE UTILIZED ON THIS PROJECT.

- A. Type "A" Entrance: Aluminum entrance hardware standard exteriors storefront doors. Each leaf at pairs of doors or each single door shall be supplied with following except where noted:
- 1 - Continuous Geared Hinge per leaf or single door - Full Mortised - Pemko - color - when storefront has a "painted" finish the color clear anodized; when storefront has an "anodized" finish the finish is to match the storefront.
 - 1- Kawneer, Sam II Concealed Overhead/Single Acting by Huskey
 - 1- Top offset pivot
 - 1- Intermediate offset pivot
 - 1- Bottom offset pivot
 - 2 - Push pulls style "C09" and "CP" Color - when storefront has a "painted" finish the color clear anodized; when storefront has an "anodized" finish the finish is to match the storefront.
 - 1 - Dead bolt MS type less cylinder (one (1) at pairs of doors)
 - 1 - Threshold - Butt hung
 - 2 - Flush bolts (at fixed leaf of door pair)
 - 1 - Surface applied bottom weatherstrip with flexible blade gasket

Note: Thresholds abutting thin set or non-recessed ceramic tile need to have the interior side adjacent to the ceramic tile flush with the top of tile. See drawings for location of ceramic tile. Verify tile installation height with Architect.

NOTE: In addition to the above, this entrance to be provided with magnetic lock (per leaf), card reader, push button release, and keyed switch. This equipment is to be provided by the Bank Equipment Installer.

Coordinate the installation of any items listed above which require wiring through the storefront head or jamb. Pre-drill electrical openings, provide bushing at new hole (grind all burs smooth) and provide pull strings to electrical box or conduit adjacent to frame.

B. Type "B" Entrance: Aluminum entrance hardware for exterior controlled access storefront doors (see hardware schedule for door to receive mechanical pushbutton combination access devices). Each leaf at pairs of doors or each single door shall be supplied with following except where noted:

1- Continuous Geared Hinge - Full Mortised - Pemko - color - when storefront has a "painted" finish the color clear anodized; when storefront has an "anodized" finish the finish is to match the storefront.

1- Kawneer Sam II Concealed Overhead/Single Acting by Huskey

1- Top offset pivot

1- Intermediate offset pivot

2 - Push pulls style "C09" and "CP" Color - when storefront has a "painted" finish the color clear anodized; when storefront has an "anodized" finish the finish is to match the storefront.

1- Adams Rite Series 4510 latch less cylinder

1- Adam Rite Series 4590 latch paddle operator

1- Simplex Series 3000 pushbutton combination access

1- Threshold - Center hung.

1- Surface applied bottom weatherstrip with flexible blade gasket

Note: Thresholds abutting thin set or non-recessed ceramic tile need to have the interior side adjacent to the ceramic tile flush with the top of tile. See drawings for location of ceramic tile. Verify tile installation height with Architect.

NOTE: In addition to the above, this entrance to be provided with magnetic lock (per leaf), card reader, push button release, and keyed switch. This equipment is to be provided by the Bank Equipment Installer.

Coordinate the installation of any items listed above which require wiring through the storefront head or jamb. Pre-drill electrical openings, provide bushing at new hole (grind all burs smooth) and provide pull strings to electrical box or conduit adjacent to frame.

2.04 FINISH

A. All exposed aluminum members shall be given a "white" fluoropolymer finish meeting AAMA 605.2 requirements.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. All items of work shall be set plumb, square, and level in their proper elevation and place and located in proper alignment with all other work. Units shall be securely anchored and ready for operation in every respect. Joints between metal and masonry shall be fully sealed as specified in section for caulking, sealing and damproofing.
- B. Where aluminum contacts other materials, protect from galvanic action.
- C. Provide match breakmetal flashing at exterior sill condition where noted on plans. Set flashing in sealant. Provide 1" water dam at jamb conditions.

3.02 CLEANING

- A. All aluminum members shall be cleaned following the procedure recommended by the manufacturer, including washing with mineral spirits, followed by washing with mild soap and water. No abrasive or caustic cleaning agents shall be used.

END OF SECTION

SECTION 08520

ALUMINUM WINDOWS

PART 1 -GENERAL

1.01 DESCRIPTION

- A. Aluminum windows with fixed glass window. Complete with glass, glazing, weatherstripping, specified anchorages, trim, attachments, and accessories.
- B. Related Work Specified Elsewhere
 - 1. Unit Masonry: Section 04200
 - 2. Rough Carpentry: Section 06100
 - 3. Finish Carpentry: Section 06200
 - 4. Sealants: Section 07900
 - 5. Glass & Glazing: Section 08800

1.02 REFERENCES

- A. American Architectural Manufacturers Association (AAMA).
 - 1. AAMA 605.2-Voluntary Specification for High Performance Organic Coatings on Architectural Extrusions and Panels.
- B. American National Standards Institute ANSI/AAMA 101-93, "Voluntary Specifications for Aluminum and Poly Vinyl Chloride (PVC) Prime Windows and Glass Doors:
- C. American Testing Society for Testing and Materials (ASTM)
- D. Flat Glass Marketing Association (FGMA) "Glazing Manual" (latest edition).

1.03 SYSTEM DESCRIPTION

- A. Configuration: flange construction [integral fin construction], fixed glass, aluminum [picture quarter circle, half circle, full circle, oval, ellipse, fan, eyebrow, arch, gothic, triangle, trapezoid, pentagon, (doghouse), hexagon, hotdog, quatrefoil, specify other] window.
- B. Frame: 2" frame depth
- C. Glazing: Exterior glazed, aluminum glazing bead, 1/4" monolithic glass, factory glazed.
- D. Muntins: single applied colonial configuration (raised exterior muntin (See drawings for pattern and number of lites), double applied colonial configuration (raised external muntin, interior flat bar).
- E. Design and Performance Requirements:
 - 1. Air leakage shall not exceed 0.25 cfm per linear foot of crack for operating sash or per square foot for fixed sash when tested at 1.57 psf according to ASTM E283.
 - 2. No water penetration shall occur when units are tested at 4.43 psf according to ASTM E547.

3. Window assembly shall withstand a positive or negative uniform static air pressure difference of 40 psf without damage when tested according to ASTM E330.
4. Glass shall be select quality complying with FS DD-G-451-D.

1.04 SUBMITTALS

- A. Shop Drawings: Submit shop drawings under provisions of Section 01300.
- B. Product Data: Submit catalog data under provisions of Section 01300.
- C. Samples:
 1. Submit corner section under provisions of Section 01300.
 2. Include glazing system, quality of construction, and specified finish.
- D. Quality Control Submittals:
 1. Certificates: Submit manufacturer's certifications indicating compliance with specified performance and design requirements.

1.05 QUALITY ASSURANCE

- A. Manufacturer' Qualifications: Minimum five (5) years documented experience in the manufacture of aluminum windows for this project.
- B. Installer Qualifications: Workmen properly trained and skilled in the installation and handling of aluminum windows as required for this project.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Store and handled windows and accessories in accordance with manufacturer's instructions.
- B. Protect the products from damage due to the elements, construction traffic, or other hazards, from the time of arrival through the completion of the project.

1.07 WARRANTY

- A. Manufacturer: Warrant material and workmanship on all products for a period of one (1) year from the Date of Substantial Completion. [insulated glass only to be warranted for ten (10) years against materially obstructed vision due to dust, film, or moisture on the interior surfaces of the glass]

PART 2 - PRODUCTS

2.01 MANUFACTURER

- A. PGT Industries, Inc., Nokomis, Florida or approved equal.
- B. Model No.: Series F-6000 fixed glass aluminum window

2.02 ALUMINUM WINDOW MATERIALS

- A. Frame Material: 6063-T5 aluminum alloy free of defects impairing strength and durability. Main frame and sash shall have a nominal wall thickness of not less than .062".
- B. Glazing attachment with silicone adhesive. Extruded 6063-T5 alloy glazing bead, .5" X .735" X 5" X .055" thick channel.
- C. Muntins: extruded aluminum 6063-T5 alloy, tube construction (flat bar used for interior surface of double applied muntins)
- D. Hardware: Stainless steel assembly screws.

2.03 ACCESSORIES

- A. Mullions: 1 X 2.75 tube mull and associated mull clips.
- B. Fasteners: 300 Series stainless steel.
- C. Continuous fins or fin tabs

2.04 FABRICATION

- A. Main frame and sash joints constructed with but joint fit, assembled with Phillips pan head screws, and factory sealed with Parbond or Schnee-Moorhead sealer.
- B. All hardware factory installed.

2.05 FINISHES

- A. Finish: White PC-518, high -speed rotary atomizer applied or electrostatically sprayed, 1.0 mil dry film thickness minimum; Supplier Idalex or equivalent.

2.06 GLASS

- A. Glass type "GL-2" as specified in Section 08800 - Glass and Glazing.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verification of Conditions: Before installation, verify that openings are plumb and square and of proper dimension. Report frame defects or unsuitable conditions to the General Contractor before proceeding.
- B. Acceptance: Beginning of installation means acceptance of existing conditions.

3.02 INSTALLATION

- A. Install window according to manufacturer's instructions and reviewed shop drawings. Do not nail through factory finish.
- B. Securely fasten frames, and set units level, plumb, and square with respect to surrounding structure, without twist or bow.

- C. Fasten with type, number, and spacing of fastener as indicated in the NOA and Test Protocols.
- D. Install sealant and related backing material at perimeter of assembly in accordance with Section 07900 Sealants so that a continuous airtight and watertight perimeter seal results. Do not use expansive foam sealant.

3.03 ADJUSTING AND CLEANING

- A. Remove visible labels.
- B. Leave windows in a job clean condition.

3.04 PROTECTION

- A. Cover windows during spray painting or other construction operations that might cause damage.

END OF SECTION.

SECTION 08584

VINYL SHUTTERS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Decorative Vinyl Shutters
- B. Anchoring Devices, etc

1.02 SUBMITTALS

- A. Shop drawings and manufacturer's data shall be submitted on materials specified in this section in accordance with Section 01300.

1.03 STORAGE AND HANDLING

- A. All shutters shall be stored on the job so that they are protected against damage.

PART 2 - PRODUCTS

2.01 MANUFACTURER

- A. Shutters are to be custom pane shutters, "Williamsburg Raised Panel Shutters" as manufactured by Mid America Shutters, Plymouth,, Michigan Tel: (877) 550-5524 or approved equal
- B. Style : "three panel/small square
- C. Size: 16 1/2" wide, 65" high.

2.02 Fasteners

- A. "Shutterlok" fasteners as provided by the shutter manufacturer.

2.03 Color

- A. Color to be: No. 28 Forest Green.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Shutter to be surface mounted per manufacturer's recommendations using manufacturer supplies fasteners.

END OF SECTION



SECTION 08710

FINISH HARDWARE

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Finish hardware as listed in the Section including Fasteners.
- B. Keys, Key Control and Keying Systems
- C. Related Work Specified Elsewhere:
 - 1. Rough Carpentry: Section 06100
 - 2. Finish Carpentry: Section 06200
 - 3. Metal Doors and Frames: Section 08100
 - 4. Wood Doors: Section 08210
 - 5. Aluminum Clad Wood French Doors: Section 08262
 - 6. Access Doors: Section 08305
 - 7. Panel Folding Doors: Section 08351

1.02 QUALITY ASSURANCE

- A. Hardware shall meet or exceed the requirements of Federal Specification FF-H 00106b, FF-H-121c, FF-H-00111b and FF-H-116c.
- B. Fire Rated Openings
 - 1. Provide hardware for fire-rated openings in compliance with A.I.A. (NBFU) Pamphlet No. 80 and NFPA Standards No. 80 and No. 101. This requirement takes precedence over other requirements for such hardware. Provide only hardware that has been tested and listed by UL for the types and sizes of doors required, and complies with the requirements of the door and door frame labels.
 - 2. Where Emergency Exit Devices are required on fire-rated doors, (with supplementary marking on door's UL labels indicating "Fire Door to be Equipped With Fire Exit Hardware") provide UL label on exit devices indicating "Fire Exit Hardware".

1.03 SUBMITTALS

- A. Submit schedule of hardware and one sample of each type of hardware for work to Architect. In addition, provide the following:
 - 1. Serial numbers in schedule for identifying packages of hardware items and their proposed locations in the work.
 - 2. Durable tag on each sample, clearly marked with sample number, Federal Type Number and proposed locations in the work.
- B. Provide templates for hardware to be installed on all doors and frames except as modified by other sections of these specifications.
- C. Submit details of keying system and key control.

1.04 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Deliver all permanent keys specified by registered mail to:

**Peoples State Bank
350 SW Main Blvd.
Lake City, FL 32056
Attn: Gilbert Miller Tel. No.: 386/754-0002**

and provide none to Contractor

- B. Receive, handle and store materials in a dry, secure space until installed.

1.05 KEYING INSTRUCTIONS

- A. This is a construction master key job.
B. Stamp all construction master keys "Construction Master".
C. Stamp all master keys and grand master keys "Do not Duplicate".
D. Ship all master keys and grand master keys to:

**Peoples State Bank
350 SW Main Blvd.
Lake City, FL 32056
Attn: Gilbert Miller Tel. No.: 386/754-0002**

- E. Key the building to the existing Grand Master key
Issue 6 Master keys for all of the locks in the building
F. Key alike the following lockset groups and issue 6 keys for each group:
- | | |
|---------|---------------------|
| GROUP A | 100A and 106A |
| GROUP B | 108A, 115A and 116A |
- G. Label keys and provide the owner with a key box, coordinate box location with the owner.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Locks
1. Equip locksets with 6-pin tumbler type lock cylinders, in master-key system.
- B. Strikes
1. Wrought box strikes with extended lip for latch bolts, except open strike plates may be used in wood frames. Provide dust-proof strikes for foot bolts.
- C. Butts
1. Doors - 1-3/4" thick - minimum 4-1/2" high.
 2. Doors - 1-3/8" thick - minimum 3-1/2" high.

3. Each door shall not have less than three hinges. Doors 8'-0" and higher shall have four hinges whether specified under items or not.
4. All butts used with door closers shall be ball bearing. All exterior doors shall have ball-bearing butts, except as otherwise specified.
5. Approved Manufacturers are Stanley Works, 480 Myrtle Street, New Britain, CT 06053, Tel: (800) 337-4393 or equal.

Models Nos:	Non Bearing	F191 (Non Ferrous - Specified Finish)
	Ball Bearing	FBB191 (Non Ferrous - Specified Finish - Fire Rated doors)

D. Door Cylinders:

1. Shall furnished by the following manufacturer and provided in the function as specified in the hardware sets:

Manufacturer

Schlage

E. Locksets:

1. Shall furnished by the following manufacturer and provided in the function as specified in the hardware sets:

Manufacturer

Design

Series

Finish

Schlage

Athens

D Series

US3 (Polished Brass)

2. All knobs, escutcheons, locksets, and cylinders shall be the products of one Manufacturer.

F. Closers

1. Closers shall be one of the following Manufacturers or approved equal and shall be furnished in the Manufacturers recommended printed size for specified condition unless otherwise noted in the hardware sets. Closers shall be full rack and pinion complete with back check. Springs shall be motor clock type. Furnish flush mounted transom brackets where not transom bar exists. Furnish parallel arm where required.

Manufacturer

Model No.

LCN

4040 with Parallel Arms

NOTE: PROVIDE POWDER COATED FINISH TO SIMULATE THE FINISH SPECIFIED IN THE HARDWARE SET.

G. Silencers

1. All interior wood and metal door frames shall have door silencers type three per single door; two per pair of doors.

<u>Manufacturer</u>	<u>Model No.</u>	<u>Type</u>
Ives	#20	for metal
Ives	#21	for wood

H. Door Stops

1. Stops shall be by one of the following Manufacturers or approved equal.

<u>Manufacturer</u>	<u>Where Pairs of Doors Interfere With One Another</u>	<u>Other Areas Unless Otherwise Specified</u>
Ives		FS436 Floor Dome
Ives		FS438 Floor Dome -high
Ives		WS406-CCV Wall
Ives		No. 69 Hinge Pin
Glynn-Johnson		410S Concealed Overhead Stop

I. Push Button Access Control Lockset:

1. Shall furnished by the following manufacturer and provided in the function as specified in the hardware sets:

<u>Manufacturer</u>	<u>Design</u>	<u>Series</u>
Simplex (Unican)		L1000

J. Coat Hooks:

1. Provide coat hooks as noted on the door hardware schedule.

<u>Item</u>	<u>Manufacturer</u>	<u>Model No.</u>
Coat Hooks	Ives	581

K. Flush Bolts

1. At interior doors provide mortised flush bolts at top and bottom of door on door edge for the appropriate function, material, and fire rating by the following manufacturer or approved equal. Provide additional hardware as noted on schedule.

<u>Manufacturer</u>	<u>Model No.</u>
Ives	262 (Manual)

L. Security Scope:

1. Provide "Door Spy" as manufactured by RB Enterprises, Tel: (800) 452-5276. Install 60" AFF centerline of door.

M. BiFold Door Hardware:

1. Provide Bi-fold door hardware, including tracks, hinges, pulls, etc.

Manufacturer	Design	Series
Stanley		BFC 30-00

N. Key Cabinet

1. Provide "Dual-Lock" key cabinet as manufactured by Block and Company, 1111 Wheeling Rd. Wheeling, IL 60090-5795, Tel: (800) 323-7556:

Model No.	Capacity
101-9030-03	30 Keys

2.02 HARDWARE SETS

ENTRY STOREFRONTS

Pair of Doors: 100A is to have the TYPE "A" storefront hardware package
(Refer to Entrances Storefront Specifications Section 8400)

Door: 106A is to have the TYPE "B" storefront hardware package
(Refer to Entrances Storefront Specifications Section 8400)

Set No. 1
(ENTRANCE)

Doors: 102A WAITING TO OFFICE
103A WAITING TO CONFERENCE ROOM
119A CSR STATION TO OFFICE
120A CSR STATION TO OFFICE
121A CSR STATION TO OFFICE
122A CSR STATION TO OFFICE

Each to have:

Qty.	Item	Model	Finish	Notes
3	Hinges	F191	US3	4 1/2 x 4 1/2
1	Leverset	D50PD	US3	
1	Coat Hook	581	US3	
1	Stop (Wall mounted)	WS406-CCV	B3	
3	Silencers	20		

Set No. 2
(PRIVACY)

Doors: 104 HALL TO MEN'S TOILET ROOM
105A HALL TO WOMEN'S TOILET ROOM

Each to have:

<u>Qty.</u>	<u>Item</u>	<u>Model</u>	<u>Finish</u>	<u>Notes</u>
3	Hinges	F191	US3	4 1/2 x 4 1/2 (Powder coated finish)
1	Leverset	D40S	US3	
1	Closer	4040	US3	
1	Stop (Wall mounted)	WS406-CCV	B3	
1	Coat Hook	581	US3	
3	Silencers	20		

Set No. 3
(PASSAGE)

Door: 107A HALL TO EMPLOYEE LOUNGE

To have:

<u>Qty.</u>	<u>Item</u>	<u>Model</u>	<u>Finish</u>	<u>Notes</u>
3	Hinges	F191	US3	4 1/2 x 4 1/2 (Powder coated finish)
1	Leverset	D10S	US3	
1	Closer	4040	US3	
1	Stop (Floor mounted)	FS438	B3	
3	Silencers	20		

Set No. 5
(PASSAGE)

Doors: 117A CSR STATION TO WORKROOM

Each to have:

<u>Qty.</u>	<u>Item</u>	<u>Model</u>	<u>Finish</u>	<u>Notes</u>
3	Hinges	F191	US3	4 1/2 x 4 1/2 (Powder coated finish)
1	Leverset	D10S	US3	
1	Closer	4040	US3	
1	Stop (Wall mounted)	WS406-CCV	B3	
3	Silencers	20		

Set No. 7
(STORAGE)

Door: 114A TELLERLINE TO NIGHT DROP ROOM

To have:

<u>Qty.</u>	<u>Item</u>	<u>Model</u>	<u>Finish</u>	<u>Notes</u>
3	Hinges	F191	US3	4 1/2 x 4 1/2 (Powder coated finish)
1	Leverset	D80PD	US3	
1	Closer	4040	US3	
1	Wide Angle Security Scope		Black	
3	Silencers	20		

Set No. 8
(STORAGE)

Door: 108A EMPLOYEE LOUNGE TO JANITOR'S CLOSET

To have:

<u>Qty.</u>	<u>Item</u>	<u>Model</u>	<u>Finish</u>	<u>Notes</u>
3	Hinges	FBB191	US3	4 1/2 x 4 1/2
1	Leverset	D80PD	US3	
1	Closer	4040	US3	(Powder coated finish)
1	Stop (Wall mounted)	WS406-CCV	B3	
3	Silencers	20		

Set No. 9
(STORAGE)

Pairs of Doors:

115A WORK ROOM TO ELECTRICAL CLOSET

116A WORK ROOM TO TEL./DATA CLOSET

To have:

<u>Qty.</u>	<u>Item</u>	<u>Model</u>	<u>Finish</u>	<u>Notes</u>
6	Hinges	F191	US3	4 1/2 x 4 1/2
1	Leverset	D80PD	US3	
2	Concealed Closer	410S	US3	
1	Flush Bolt	262 (Manual)	US3	Top of left inactive leaf
2	Silencer	20		

Set No. 11
(COMBINATION)

Door: 117A WORK ROOM TO TELLELINE

To have:

<u>Qty.</u>	<u>Item</u>	<u>Model</u>	<u>Finish</u>	<u>Notes</u>
3	Hinges	F191	US3	4 1/2 x 4 1/2
1	Combination Leverset	L1000	US3	
1	Closer	4040	US3	(Powder coated finish)
1	Stop (Floor mounted)	FS436	B3	
1	Wide Angle Security Scope		Black	
3	Silencers	20		

Set No. 12
(PASSAGE)

Door: 109A WAITING TO SAFE KEEPING

To have:

<u>Qty.</u>	<u>Item</u>	<u>Model</u>	<u>Finish</u>	<u>Notes</u>
3	Hinges	F191	US3	4 1/2 x 4 1/2
1	Leverset	D10S	US3	
1	Closer	4040	US3	(Powder coated finish)
1	Stop (Floor mounted)	FS436	B3	
3	Silencers	20		
1	Electric Strike	ES-110	US3	
1	Deadbolt	FB257N	US3	

Note: Biometric reader to be provided and installed by bank security installer at this door.

Set No. 13
(PASSAGE)

Pairs of Doors:

101A VESTIBULE TO ENTRY

To have:

<u>Qty.</u>	<u>Item</u>	<u>Model</u>	<u>Finish</u>	<u>Notes</u>
6	Hinges	F191	US3	4 1/2 x 4 1/2
2	Push/Pull Plates		US3	
2	Closer	4040	US3	(Powder coated finish)
2	Stop (Floor mounted)	FS436	B3	

PART 3 - EXECUTION

3.01 INSTALLATION

- A. All items fastened to solid wood shall be secured with wood screws; hollow core wood and hollow metal material, thru bolts, or machine screws to reinforced metal; concrete matching screws with expansion shields.
- B. Fit accurately, apply securely and adjust properly all materials specified herein.
- C. Hardware Locations
 - 1. Center doorknobs 38 inches above floor.
 - 2. Dead locks 48 inches (maximum) above floor.
 - 3. Door pulls 42 inches above floor.
 - 4. Push plates 48 inches (maximum) to centerline above floor.
 - 5. Coat hooks - 65 inches above floor.
 - 6. Hinges - 10" from floor to bottom of hinges, 5" from top of door to hinge top. Center hinge equi-distant between top and bottom hinges.

END OF SECTION

SECTION 08800

GLASS AND GLAZING

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Glass and Glazing
- B. Glazing Sealants and Accessories
- C. Related Work Specified Elsewhere:
 - 1. Entrances and Storefronts: Section 08400

1.02 QUALITY ASSURANCE

- A. All material shall meet Federal Specification and ASTM Standards.
- B. Tempered glass shall be permanently identified with manufacturer's name and the words "Fully Tempered".

1.03 SUBMITTALS

- A. Furnish to the Architect affidavits, executed in triplicate, certifying all materials comply with the requirements of these specifications.
- B. Submit samples, manufacturer's data, etc. for each type of glazing specified.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Exterior Glass (GL-1): to be "PPG" Optigray Gray, Heat Strengthened float (tempered glass where noted on plans), 1/4" thick, polished both sides. The shading coefficient for 1/4" Optigray shall be 0.48.

ALL TINTED GLASS TO BE HEAT STRENGTHENED

- B. Interior Glass (GL-2): to be Window Manufacturer's standard "gray tinted" glass, (tempered where noted on plans), 3/16" thick, clear, polished both sides.
- C. Interior Glass (GL-3): to be "PPG" Monolithic Glass, (tempered where noted on plans), 1/2" thick, clear, polished both sides, grind all edges smooth to pencil edge.
- D. Wire Glass: 1/4" thickness, square mesh, ASTM C1036-85 Type II Class 1, Form 1 Quality q8, Mesh m2; meet ANSI Z97.1-1984; UL listed as fire-retardant.
- E. Glazing sealant shall be G.E. Silglaze or equal, meeting Federal Specification TT-S-001543.
- F. Glazing tape shall be a Polyvinyl Chloride Foam Tape.

- G. Glazing accessories such as points, setting blocks, shims, stop beads, angles, wire spring clips shall be standard commercial products of the type recommended by the glass manufacturer and approved by the Architect.

PART 3 - EXECUTION

3.01 INSPECTION

- A. Inspect all frames to be glazed before starting work. If any corrections are required, notify Architect in writing, and start work only after the frames are in proper condition.
- B. Coated Glass
 - 1. Quality for vision areas shall be assessed by inspecting the glass against bright uniform background.
 - 2. Uniformity: Viewed from a distance of 10 feet, some mottling or streaking caused by the coating may appear.
- C. Surface Appearance
 - 1. Pinholes: Pinholes greater than 1/16" shall not be allowed. Large clusters of close spacing of smaller pinholes visible from a distance of six feet shall only be allowed in an area of glass through which a person normally would not be looking.
 - 2. Scratches: Viewed from a distance of 10 feet, visible scratches longer than 3" shall not be allowed in the normal viewing area. Visible scratches longer than 3" shall be allowed only within 3" of an edge or in an area of the glass through which a person normally would not be looking.

3.02 PREPARATION

- A. All glazing shall be done by experienced workmen in a first-class workmanship like manner. Except where special settings are shown or specified, all glazing shall be done to conform to recommendations in "Glazing Manual" issued by Flat Jobbers Association and the following:
 - 1. Glazing work shall be done only when the temperature is above 49°.
 - 2. Surfaces to be glazed and glass shall be thoroughly clean and dry at the time glazing is done.

3.03 INSTALLATION

- A. Set all glass in glazing tape and bed of sealant where required. See details on drawings.
- B. Install buttons or setting blocks under lower edge of large lights of glass, 4' X 4' size and larger.
- C. All glass shall be cut and edges finished according to manufacturer's specifications for glass and area of installation.
- D. All glass edges and joint surfaces must be free of dirt, cutting oil, grease and other contaminants prior to silicone application.
- E. Tempered glass shall be installed with tong marks at bottom of opening to be glazed.

- F. Glass surfaces must also be protected against surface damage from welding sparks, wind-blown debris, and run off from adjacent alkaline or oxidizing steel materials. Welding sparks and wind-blown debris can cause surface damage and significantly reduce the strength of the glass. Alkaline and oxidizing steel run off can result in permanent surface staining; such situation may mandate washing the glass during building construction and frequently for a period after completion.

3.04 CLEANING

- A. Upon completion of the installation, the glass shall be cleaned with the glass manufacturer's instructions.

END OF SECTION



DIVISION 9 FINISHES

SECTION	09260	GYPSUM WALLBOARD SYSTEMS	1 THRU 7
SECTION	09331	CERAMIC FLOOR TILE	1 THRU 3
SECTION	09510	ACOUSTICAL CEILINGS	1 THRU 2
SECTION	09650	RESILIENT FLOORING	1 THRU 3
SECTION	09680	CARPETING	1 THRU 3
SECTION	09900	PAINTING	1 THRU 6
SECTION	09950	VINYL WALLCOVERING	1 THRU 2



SECTION 09260

GYPSUM WALLBOARD SYSTEMS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Gypsum drywall on metal framing and metal furring on exterior walls
- B. Interior metal stud system, entirely and Soffit and Bulkhead framing as shown on drawings.
- C. Spray texturing
- D. Install access panels and doors provided by various trades.
- E. Provide and install all metal and wood backing materials required for installation of all fixtures, cabinets, etc. to gypsum drywall partitions. Wood blocking is specified under 06100 of this Specification.
- F. Related Work Specified Elsewhere:
 - 1. Rough Carpentry: Section 06100
 - 2. Sealants: Section 07900
 - 3. Plastic Faced Wood Doors: Section 08213
 - 4. Painting: Section 09900
 - 5. General Provisions, Mechanical: Section 15010
 - 6. General Provisions, Electrical: Section 16010

1.02 QUALITY ASSURANCE

- A. All material shall meet Federal Specification and ASTM Standards.

1.03 SUBMITTALS

- A. Shop drawings shall be submitted on all materials specified in this section.

1.04 STORAGE AND HANDLING

- A. Stock pile wallboard at project flat on floor in piles with care against loading beyond load limits of floor. Leave in original wrappings or containers until ready for actual use.
- B. Protect Wallboard from wetting.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Framing Members
 - 1. Standard metal Studs, runners:

- a. Size: 25 Gauge uncoated thickness minimum, electro-galvanized steel, meeting ASTM C645-83; 1-1/4" minimum face width by required depths and lengths indicated.

At door and storefront jambs: 20 Gauge uncoated thickness minimum, electro-galvanized steel, meeting ASTM C645-83; 1-1/4" minimum face width by required depths and lengths indicated.

At access panel surrounds: 18 Gauge uncoated thickness minimum, electro-galvanized steel, meeting ASTM C645-83; 1-1/4" minimum face width by required depths and lengths indicated.
- b. Actual gauge required by partition height in accord with stud manufacturer's product data for height/gauge.
2. Floor and ceiling runners: Electro-galvanized steel, 1" deep, minimum, by widths to receive studs, same gauge uncoated thickness as studs.
3. Shaftwall Studs, runners:
 - a. C-H Stud - (Gauge as noted on drawings) uncoated thickness minimum, electro-galvanized steel, meeting ASTM C645-83; 1-1/2" minimum face width by required depths and lengths indicated.
 - b. J-Runner - (Gauge as noted on drawings) uncoated thickness minimum, electro-galvanized steel, meeting ASTM C645-83; 1" and 2" minimum faces width by required depths and lengths indicated.
 - c. Actual gauge required by partition height in accord with stud manufacturer's product data for height/gauge.
- B. Furring Channels:
 1. Metal Furring Channel (High Hat) - 7/8" deep by 2 9/16" wide with 1 1/4" face width, minimum 25 gauge galvanized steel.
 2. Metal Z-Furring - 1", 1 1/2", 2", 3", (as indicated on drawings) minimum 24 gauge galvanized steel.
- C. Gypsum Board:
 1. Gypsum wallboard panels (regular) Federal Specification Type III Grade R Class 1, ASTM C-36 tapered edge, thickness as noted on plans.
 2. Gypsum wallboard panels (fire rated) Federal Specification Type III Grade X, Class 3, ASTM C-36 tapered edge, thickness as noted on plans.
 3. Gypsum wallboard panels (water resistant) Federal Specification Type VII Grade W or X, Class 2 ASTM C-630 tapered edge, thickness as noted on plans.
 4. Gypsum sheathing panels, Federal Specification SS-L-30D, Type II Grade W, Class 1 ASTM C-79, thickness as noted on plans.
 5. Gypsum line panels, 1" thick gypsum core panels, 24" wide, bevel edges.

D. Sound Control Materials

1. Sound attenuation blankets, acceptable products: Specified in Building Insulation section.
2. Acoustical Sealant:
 - a. Acceptable Products:
 - 1) Pecora Corp.; BA-98
 - 2) Tremco, Inc.; Tremco Acoustical Sealant
 - b. Type: Non-hardening, non-skinning, synthetic rubber.
3. Acoustical tape: Closed cell, polyvinyl chloride (PVC) foam tape, 1/4" thickness by 1" wide.

E. Fire-rated insulation for rated assemblies: Specified in Building Insulation Section.

F. Joint Materials and Adhesives:

1. Joint compound, Federal Specifications SS-W-570B, Type I, ASTM C-475.
2. Reinforced tape, Federal Specification SS-J-570B, Type II, ASTM C-475.
3. Adhesive - type recommended by wallboard manufacturer.

G. Fasteners:

1. Screws Type G, self-drilling, ASTM C-646.

H. Accessories

1. Metal corner beads and trim, Federal Specification QQ-S-775E, Class E, ASTM A-525.
2. Carrying channels shall be 3/4" and 1-1/2" cold rolled channels (as indicated on the drawings, 16 Gauge, black asphaltum finish.
3. Hanger wire shall be 8 Gage, galvanized, annealed.
4. Furring channel clips shall be galvanized wire clips designed to be used with metal furring attached to 1-1/2" channel.
5. Metal Angles, 24 gauge galvanized steel, 1 3/8" X 7/8" or 2 1/2" X 2 1/2".

I. Spray Textured Finish

1. USG Spray Texture Finish System: A non-asbestos product, unaggregated.

PART 3 - EXECUTION

3.01 INSPECTION

- A. Examine and inspect all surfaces and supports to which gypsum wallboard is to be applied. If, in the opinion of the Drywall Contractor, any corrections should be made of

defects to the base surface which will jeopardize a satisfactory finish wall. he shall bring this to the attention of the General Contractor and Architect's field representative prior to any installation.

3.02 PREPARATION

- A. Minimum temperature in space shall be 50° F. Preferable minimum is 70° F.
- B. Provide ventilation and heat is required to remove excess moisture.

3.03 INSTALLATION

- A. Install all metal studs and accessories according to wallboard manufacturer's recommendation.
 - 1. All base and head plates or channel members shall be securely anchored in place, centered accurately in location called for on drawings and positioned in true, straight line.
 - 2. Wall studs shall be anchored securely, properly braced where required, and erected plumb.
 - 3. Where studs extend above finished ceiling line, install an additional cross member at ceiling line to provide support for the drywall to eliminate bowing between studs.
- B. Wall Furring
 - 1. Attach furring channel to masonry and concrete wall with concrete stub nail 16" on center and on edges of all openings.
 - 2. Attach horizontal members at finished ceiling line to support top of drywall between studs, shim as necessary to provide straight finished wall lines.
- C. Ceiling Furring
 - 1. Install carrying channels with hangers at 4'-0" on centers.
 - 2. Secure furring channels with furring clips at 16" on center and on edges at all openings.
- D. All wallboard joints shall be butted loosely together. Butt ends shall not be placed against a tapered edge. Maximum allowance gap at end joints shall be 1/4".
- E. Install in maximum practical lengths to span ceiling and walls without end butt joints. If butt joints do occur, stagger joints and locate far as possible from center ceilings or walls.
- F. End joints shall be made between framing members. Float, taper, and back-block joints.
- G. Support all joints on framing members. Apply end joint compound to back of wallboard along end joints.
- H. Joint layout at opening shall be made so that no end joint will align with edges of opening. Install control joints in walls at intervals not to exceed 30' and in ceiling not to exceed 50' in either direction.

- I. Install metal trim at edges, and windows, securely fastened according to manufacturer's instructions.
- J. Openings cut in wallboard to fit electrical outlets, plumbing, piping, etc. shall fit snugly and shall be small enough to be covered by plates and escutcheons.
- K. Mix all adhesive and joint finishing compounds in strict accordance with manufacturer's direction. Mix only enough at one time to be used up during recommended pot life of compound.
- L. Fasteners
 - 1. Install fasteners no closer than 3/8" to end or edge.
 - 2. Space fasteners opposite each other on adjacent ends of edges
 - 3. Begin fastening from center of wallboard and proceed toward outer end or edges.
 - 4. Apply pressure on wallboard adjacent to fasteners being driven to insure that wallboard will be secured tightly to framing member.
 - 5. Drive fasteners with shank reasonable perpendicular to face of board.
- M. Screwing
 - 1. Drive screws with a power screwdriver as recommended by wallboard manufacturer.
 - 2. Surface of head shall be below surface of paper without cutting paper.
- N. Single Ply Application
 - 1. General Notes.
 - a. Apply wallboard on walls horizontally (long edges of the board perpendicular/right angles to framing) unless noted otherwise. Install wallboard in accordance with the requirements of Underwriters Laboratory (U.L.) requirements when U.L. partitions or construction are indicated on the drawings.
 - b. No vertical joints shall occur within 8" of external corner of windows, doors, or other such openings except at control joints.
 - c. End joints shall be on framing members.
 - 2. Application of Screws
 - a. Space screws at 12 inches on center; space nails at 8" O.C. Fasten board to framing members, both vertical and horizontal,
- O. Two-Ply Application to Metal Framing
 - 1. Base Layer
 - a. Apply wallboard on walls vertically (long edges of the board parallel to framing) unless noted otherwise. Install wallboard in accordance with the

requirements of Underwriters Laboratory (U.L.) requirements when U.L. partitions or construction are indicated on the drawings.

- b. End joints shall be on framing members.
- c. Fasten board to framing members, both vertical and horizontal, with screws spaced at 12" O. C. maximum.

2. Finish Layer

- a. Install finish layer with laminating adhesive.
- b. Apply wallboard on walls horizontally (long edges of the board perpendicular/right angles to framing) unless noted otherwise. Install wallboard in accordance with the requirements of Underwriters Laboratory (U.L.) requirements when U.L. partitions or construction are indicated on the drawings.
- c. Cut and fit boards, and then apply laminating adhesive uniformly over entire back surface with spreader blade (spreader blade shall leave ridges of adhesive 1/4" X 1/4" at 2" on center).
- d. Position board and hold in place temporarily with sufficient nails or bracing to ensure adequate bond between layers.
- e. Allow adhesive to dry 24 to 48 hours. Remove temporary nails and shoring. Fill holes with joint treatment compound.

P. Joint Treatment

- 1. Apply a uniformly thin layer of bedding compound over the joint approximately 4" wide. Center tape over joint and embed into compound.
- 2. Allow compound to dry thoroughly. For normal conditions this will be approximately 24 hours. Cover tape with a coat of topping and spread out 3" on each side of tape. Feather out at edge.
- 3. After preceding coat is thoroughly dry, apply another coat over joint. This coat must be smooth and with edges feather out 3" beyond preceding coat.
- 4. Reinforce ceiling and wall angles and inside corner angles with tape folded to angle and embedded into corner beads. Apply at least one additional coat and feather out edges.
- 5. All screw heads and dimples shall be concealed by at least 3 coats of compound. Apply as each coat is applied to joints, allowing at least 24 hours between each coat.
- 6. Flanges of corner bead and trim shall be concealed by at least 2 coats of compound. First layer shall be bedding compound. Apply along with respective coats of compound on joints. Feather out approximately 9 inches from metal bead.
- 7. Sand coats of compound when thoroughly dry, if sanding is needed. Avoid roughing surface of wallboard.
- 8. Leave wallboard and treated areas smooth and uniform and ready decoration.

Q. Moisture Resistant Wallboard

1. Install as recommended by the manufacturer of the wallboard.
2. Use full sheets of board (no scraps) to eliminate butt joints.
3. Treat all joints and fastener heads as recommended by the wallboard manufacturer.
4. Moisture Resistant Wallboard shall be provided at all locations where water lines are present including but not limited to kitchens, employee lounges, toilet rooms, restrooms, bathrooms, janitor's closets, etc. See Plumbing and Mechanical Plans for locations of all water lines

R. Patching

1. After trim has been applied and prior to decoration, correct all surface damage and defects as required, to leave work smooth and without observable blemishes which will show through the decoration.

S. Spray Texture Finish

1. Application
 - a. Apply with brush, roller or with suitable spray equipment at a rate of 20 to 50 lb./1000 square feet. Spray using 16" to 20" fan. Hold gun 16" to 18" from surface. Overlap preceding application with 1/2 to 2/3 of fan width. With 75 to 125 ft. of 1/2" hose, use 30 to 40 lb. fluid pressure and 50 to 60lb. atomizing pressure, then texture with roller or other tool. For finer textures and designs, use small brush, roller-stippler, the fingers, whiskbroom, crumpled paper, comb or similar items. Flatten raised variations. Maintain minimum 55° F minimum air and surface temperature during application until surface is dry. Avoid drafts while applying, but provide ventilation after application to aid drying. Do not use unvented gas or oil heaters. May be painted after overnight drying.
2. Application Locations
 - a. All interior gypsum board, scheduled to be painted, shall receive spray texture finish. Do not apply spray texture finish to those locations scheduled to received vinyl wall covering or wall fabric.
3. Finish Texture
 - a. All locations scheduled to received spray texture finish shall finished so as to provide a light "Orange Peel" surface texture.

U. Identification of Rated Partitions

1. Corridor partitions, smokestop partitions, horizontal exit partitions, exit enclosures, and fire rated partitions shall be effectively and permanently identified with signs or stenciling. Such identification shall be above any decorative ceiling and in concealed spaces. The identification shall read as follows: "FIRE AND SMOKE BARRIER - PROTECT ALL OPENINGS."

END OF SECTION



SECTION 09331

CERAMIC FLOOR TILE

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Floor Tile
- B. Setting Bed, Crack Control Underlayment
- C. Grout and Latex Additive
- D. Floor Preparation, Patching, and Feathering
- E. Expansion Joint and Metal Edge Strip
- F. Related Work Specified Elsewhere:
 - 1. Cast-In-Place Concrete: Section 03300
 - 2. Rough Carpentry: Section 06100

1.02 QUALITY ASSURANCE

- A. All floor tile work shall meet Federal Specifications, ASTM Standards and ANSI Requirements.

1.03 SUBMITTALS

- A. Submit samples of all floor tile, grout and accessories to Architect for approval in accordance with Section 01300.

1.04 MAINTENANCE

- A. Extra Materials: Provide two full, unbroken cartons of each type and color tile specified for Owner's maintenance.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. See Floor Tile Code Schedule on drawings for floor tile manufacturer, type, size, grout, and installation method.
- B. Mortar shall be polycrrete latex mortar.
- C. Grout shall be acid-R floor grout gauged with latex admixture as recommended by grout manufacturer.
- D. Trim Shapes: Match tile color and size for application. Include bullnose base, bullnose caps beads and corner units as required.
- E. Expansion Joint: Schulter Systems, 194 Pleasant Ridge Rd., Plattsburgh, NY 12901, Tel (800) 472-4588:

Model: Dilex-BWS Expansion Joint and Insert.
Model number and size of joint to match grout joint of floor tile. Insert Color to be selected by Architect. Submit color samples for approval.

F. Metal Edge Strip (angle):

Schulter Systems, 194 Pleasant Ridge Rd., Plattsburgh, NY 12901, Tel (800) 472-4588:

Model: Schiene,
Size: 3/8" X 3/4" X 1/8".

Brass - M-100,

G. Crack Isolation Underlayment Sheet: NobleSeal CIS (Crack Isolation Sheet), composite chlorinated polyethylene (CPE) with high strength, non-woven polyester laminated to both sides, as manufactured by the Noble Co., 614 Monroe Street, Grand Haven, Michigan 49417, tel. (800) 878-5788.

H. Floor Preparation compound or underlayment to be one of the following:

Bonsal - B-1 Leveler polymer modified, cement based underlayment

Hydroment - Fast Patch 102 polymer modified, cement based compound or approved equal.

Note: Provide and install substrate primer per recommendations of floor preparation manufacturer.

PART 3 - EXECUTION

3.01 INSPECTION

- A. Prior to installing any floor tile, the Contractor shall inspect substrate and surfaces that are to receive floor tile; he shall notify the Architect in writing of any serious defects or condition that will interfere with, or prevent a satisfactory installation. Failure of the Floor Tile Contractor to provide this notification and with the commencement of installation, the Floor Tile Contractor accepts the condition of the floors as being ready to receive tile. Correction of any defects or deficiencies in floor tile installation attributable to substrate surface conditions will be the responsibility of the Floor Tile Contractor.

3.02 INSTALLATION

- A. Install tile work in according with latest ANSI Standards and TCA Handbook Standards for applicable installation method.
- B. Allowable tolerances: Plumb, level, and true to line within $\pm 1/2"$ in an undivided space and $\pm 1/16"$ maximum in a running foot.
- C. Prepare substrate using floor preparation (patch) material. Install per manufacturer's recommendations. Patch cracks, fill depression, feather transitions to adjacent surfaces.
- D. Provide expansion joints at intervals not to exceed manufacturer's recommendations. Coordinate location of expansion joints with Architect (see drawings).

- E. Install brass edge strip (angle) at floor tile/carpet junction - See Finish Plan for location. See Detail on drawings for further information.
- F. Install floor tile expansion joints per manufacturer's installation instructions at locations indicated on Floor Plans - See Finish Plan for location. See Detail on drawings for further information.
- G. Install underlayment under all floor tile on all surfaces specified to receive floor tile. Underlayment to be installed under all floor tile per manufacturer's recommendations. Bond to substrate using The Noble Co. - NobleBond 21 Adhesive or with latex modified, thin-set mortar.

3.03 CLEANING AND PROTECTION

- A. Clean tile as Work progresses, preventing accumulation of setting and grouting materials or debris on tile face. Cleaning methods to be per manufacturer's recommendations. DO NOT CLEAN TILE OR GROUT WITH MURATIC ACID.
- B. Protection: Protect installed tile work until Date of Substantial Completion by covering with draft paper; tape joints and edges. Remove just prior to Date of Substantial Completion; Final cleaning of tile.

END OF SECTION



SECTION 09510

ACOUSTICAL CEILINGS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Acoustical Lay-in Ceilings.

1.02 QUALITY ASSURANCE

- A. All acoustical ceiling work shall meet Federal Specifications, ASTM Standards and Acoustical Materials Association Bulletin.

1.03 SUBMITTALS

- A. Submit samples of all ceiling tile and grid system to Architect for approval accordance with Section 01300.

1.04 MAINTENANCE

- A. Extra Materials: Provide extra materials equal to 1% of each type and color tile specified for Owner's maintenance. Provide extra suspension system component in amount sufficient to install extra ceiling units.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. See Acoustical Tile Code Schedule on drawings for ceiling tile manufacturer, type, size, color, suspension system type (size and color), etc.
- B. Suspension system shall be designed to carry the loads imposed on it by the lighting fixtures.
- C. Hanger Wire: No. 12 galvanized and annealed wire.
- D. Molding: Metal angles, finish and color to match suspension system.
- E. Wall Molding: Manufacturer's prefabricated wall molding at all conditions as noted below:

Non-Tegular Ceiling Tiles:	Standard Hemmed Edge Angle
Tegular Ceiling Tiles	Hemmed Shadow Molding

SEE ACOUSTICAL CEILING TILE CODE SCHEDULE ON DRAWINGS.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Furnish and install the exposed grid system in accordance with the manufacturer's recommendations and ASTM C 636.
- B. Lighting Fixtures

1. Provide sufficient hanger wires to support the grid level to within $\pm 1/8$ " in twelve (12) feet with fixture installed.
2. Coordinate with supplier and installer of fixtures prior to delivery of materials. Where fire rated assemblies are specified, install acoustical materials in strict conformance with applicable UL assembly drawings.
3. Provide necessary hanger wires for use by installation performed under section 16500 where the fixtures are surface mounted or for non-modular size fixtures.
4. Cutting of tile to accommodate non-modular fixtures, including round or square incandescent units shall be performed under this section.

C. Edge Detail

1. All tiles shall be installed in the same plane unless otherwise indicated on drawings.
2. Where cutting of tile is required as part of installation at junction of vertical surfaces, installer shall field modify cut edge to match factory edge.
3. When portions of modified (field cut) tile are installed below bottom of grid (i.e. tegular), installer shall finish cut edge with two coats of flat latex paint to match specified tile color.

END OF SECTION

SECTION 09650

RESILIENT FLOORING

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Resilient Flooring: Vinyl Composition Tile Flooring (VCT)
- B. Vinyl Base
- C. Floor preparation, Patching, and Feathering
- D. Floor transitions.

1.02 QUALITY ASSURANCE

- A. All resilient flooring and vinyl base shall meet Federal Specifications and ASTM Standards.

1.03 SUBMITTALS

- A. Submit samples of all flooring and base to Architect for approval in accordance with Section 01300.

1.04 MAINTENANCE

- A. Extra Materials:
 - 1. Vinyl Composition Tile Flooring (VCT): Provide one full, unbroken carton of each type and color tile for every 1000 square feet of each tile for Owner's maintenance.
 - 2. Vinyl Base: Provide 10% additional material of each type vinyl base for Owner's maintenance.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. See Resilient Floor Code Schedule on drawings for sheet vinyl and VCT flooring manufacturer, type, style, color, etc.
- B. See Base Code Schedule on drawings for base manufacturer, type, style, color, etc. Base shall be provided in "continuous" rolls and shall conform to Federal Specification SS-W-40.
- C. Vinyl Terminal Strips: Shall be beveled vinyl plastic, 3/8" X 1" bevel. Color as selected by Architect.
- D. Floor Transition Materials
 - 1. Floor transition materials to be Subfloor Leveler System, LS-40 Series as manufactured by Johnsonite, 16910 Munn Road, Chagrin Falls, Ohio 44023, Tel: (800) 661-2162. Select from one or more of the following in order to achieve proper transition.

Elevation From	Model No.
1/8" to 0" over a 12" width	LS-40-F
1/4" to 0" over a 12" width	LS-40
3/8" to 0" over a 12" width	LS-40-D
3/8" to 0" over an 18" width	LS-40 plus LS-40-B
1/2" to 0" over a 12" width	LS-40-E
1/2" to 0" over an 18" width	LS-40-D plus LS-40-C
1/2" to 0" over a 24" width	LS-40 plus LS-40-B & LS-40-C

2. Secure floor transition materials with Johnsonite #965 Flooring and Tread Adhesive.

E. Wax: Shall conform to Federal Specifications P-W-155, 16% concentration.

F. Floor Preparation compound or underlayment to be one of the following:

Bonsal - B-1 Leveler polymer modified, cement based underlayment

Hydroment - Fast Patch 102 polymer modified, cement based compound or approved equal.

Note: Provide and install substrate primer per recommendations of floor preparation manufacturer.

PART 3 - EXECUTION

3.01 INSPECTION

A. The Contractor shall carefully examine all surfaces to receive flooring and base and shall immediately report any irregularities to the Architect. The Installer shall vacuum clean and prepare floors to satisfactory condition to receive the resilient flooring. The start of the installation of flooring shall be an indication of the Contractor's acceptance of the surfaces as being satisfactory for installing the resilient flooring, and he will automatically assume the responsibility for any unacceptable finished work caused by surface conditions.

3.02 PREPARATION

A. Surfaces to receive resilient flooring shall be swept clean and shall be free from moisture, paint, oil, wax, or other film that may affect the adhesion. Cracks, rough areas, joints and other surface defects in the subfloor shall be filled or patched with floor preparation compound or underlayment. Ridges, trowel marks, and other surface projections shall be ground smooth.

3.03 INSTALLATION

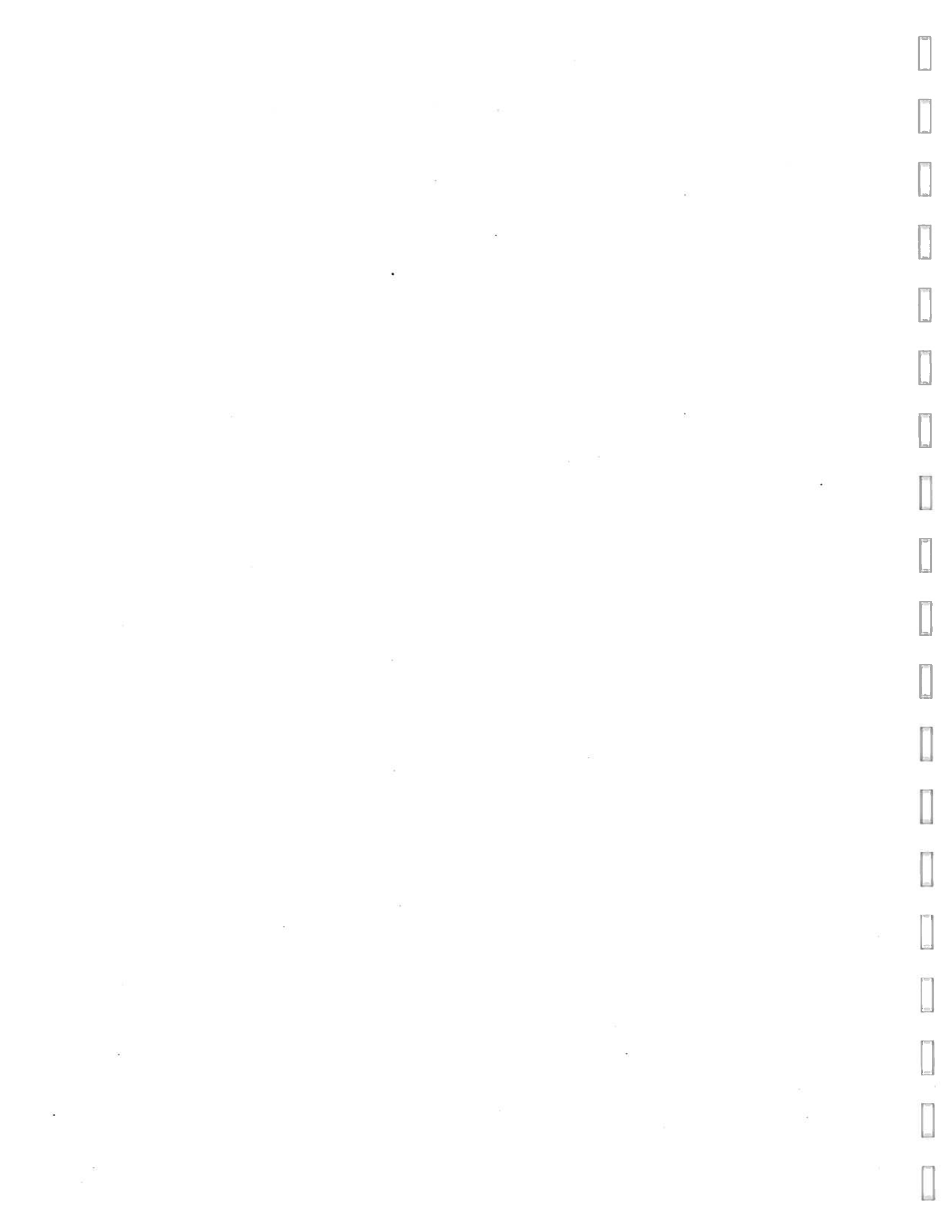
- A. All resilient tiles shall be installed from center of rooms so that equal size tiles will result at edges. No edge tile less than half of full tile will be acceptable. Marblization shall run in one direction; that being the narrow dimension of the room.
- B. Primer: If recommended by the flooring manufacturer, shall be applied evenly over the floor surfaces to receive resilient floor.
- C. Adhesive: Shall then be applied after the primer has dried thoroughly. Method of application shall be in accordance with flooring manufacturer instructions.

- D. Base: Shall be secured to the wall with base adhesive. Joints shall be tight and the base shall have the top and bottom edges in firm contact with walls and floors. Note: in rooms to receive carpet, base shall be installed above carpet after carpet has been installed.
- E. Vinyl Terminal Strips: Shall be installed at exposed edges of resilient flooring or when abutting adjacent floor materials (except as noted below). The top surface shall be flush with the finished floor.
- F. Where VCT or Sheet Vinyl Flooring meet adjacent dissimilar floor finishes (example, carpet, ceramic tile, etc.), and there is a height difference, float VCT or Sheet Vinyl Floor to adjacent flooring at all locations except where joint is located under door or threshold. Use floor transition material to make a smooth transition, so that adjacent flooring is flush. Contractor to verify adjacent floor finishes and height differential. Install floor transition material (model) required to accommodate specific transition height.
- G. Vinyl Base Installation
 - 1. Outside Corner: At outside corner, continue to the corner. Make sure the base is in the proper position on the wall, as it would be installed. Using a pencil or pen, mark the back of the base using the wall as a guide. This will give correct contour of the wall. Next, turn the base face down with the back face up. Use a gouge, starting under the top lip of the base, (note: always gauge on the side of the line in the direction the base will be going). Do not gouge on the center of the line). Gouge from the top of the base to the bottom. When completed, use the gauge to make two (2) stress relief gouges at the bottom, in the thick part of the base at the top of the toe, about one inch from each side of the center gouge. Make the gauges downward approximately one half inch long. This will allow the corner to be easily formed. Pull up on the toe and turn inside out. Position base after applying adhesive and set in place and allow the toe to drop down to form corner. (Note: if using "Vinyl" base, heat base to make it more pliable before installation).
 - 2. Inside Corner: At inside corner, use scribe to mark the base using the corner as the pattern to obtain exact curvature of the wall. Cut the base to the exact length obtaining a good, tight fit to the wall. Use the same procedure as the other wall with only one exception, after the base is cut to fit the contours of the other wall and base, turn the base from side down and make a back angle cut in the toe, starting at the top of the toe cutting down to the bottom of the toe. Check the fit with the base on the wall. Then make any additional cuts to make a tight fit. Apply adhesive and install.

3.04 CLEANING AND PROTECTION

- A. Immediately upon completion of the flooring, the floor and adjacent surfaces shall be dry-cleaned with an approved cleaner to remove surplus adhesive and other soiling. Floors shall not be washed for at least five (5) days after installation at which time they shall be washed with an approved non-alkaline cleaning solution, rinsed thoroughly with clear, cold water.
- B. After proper cleaning, all resilient flooring (except "No-Wax Sheet Vinyl") to be given two (2) coats of wax, machine buffed after each coat.
- C. After waxing and until acceptance by the Owner, the finished resilient flooring shall be protected.

END OF SECTION



SECTION 09680

CARPETING

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Carpeting.
- B. Low VOC (volatile organic compounds) Emitting Floor Covering Adhesive (at direct glue-down installation)
- C. Preparation of floor to receive carpet.
- D. Floor transitions at adjacent materials or equipment.
- E. Related Work Specified Elsewhere:
 - 1. Ceramic Floor Tile: Section 09331
 - 2. Resilient Flooring: Section 09650

1.02 QUALITY ASSURANCE

- A. AATCC-134 (Electrostatic Prodensity).
- B. ASTM D-2859 & ASTM E-648
- C. NBS smoke chamber test maximum average of 450.

1.03 SUBMITTALS

- A. Submit samples of all carpet to Architect for approval in accordance with Section 01300.

1.04 MAINTENANCE

- A. Extra Materials: Provide extra materials equal to 5% of each type and color carpet specified for Owner's maintenance.
- B. Provide Owner with Manufacturer's written maintenance manuals.

1.05 GUARANTEE

- A. A certification of warranty from the carpet manufacturer shall be furnished to the Owner stating that the carpet is warranted for a period of ten (10) year against limited wear.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. See Carpet Code Schedule on drawings for carpet manufacturer, type, style, color, etc.
- B. Adhesive for direct glue installation to be Low VOC (volatile organic compounds) Emitting Floor Covering Adhesive as per manufacturer's recommendations.

- C. Floor Preparation compound or underlayment to be one of the following:
- Bonsal - B-1 Leveler polymer modified, cement based underlayment
- Hydroment - Fast Patch 102 polymer modified, cement based compound or approved equal.
- Note: Provide and install substrate primer per recommendations of floor preparation manufacturer.
- D. Floor Transition Materials
1. Floor transition materials to be Subfloor Leveler System, LS-40 Series a as manufactured by Johnsonite, 16910 Munn Road, Chagrin Falls, Ohio 44023, Tel: (800) 661-2162. Select from one or more of the following in order to achieve proper transition.
- | Elevation From | Model No. |
|------------------------------|------------------------------|
| 1/8" to 0" over a 12" width | LS-40-F |
| 1/4" to 0" over a 12" width | LS-40 |
| 3/8" to 0" over a 12" width | LS-40-D |
| 3/8" to 0" over an 18" width | LS-40 plus LS-40-B |
| 1/2" to 0" over a 12" width | LS-40-E |
| 1/2" to 0" over an 18" width | LS-40-D plus LS-40-C |
| 1/2" to 0" over a 24" width | LS-40 plus LS-40-B & LS-40-C |
2. Secure floor transition materials with Johnsonite #965 Flooring and Tread Adhesive.

PART 3 - EXECUTION

3.01 INSPECTION

- A. The Contractor shall carefully examine all surfaces to receive carpeting and shall immediately report any irregularities to the Architect. The Installer shall vacuum clean and prepare floors to satisfactory condition to receive the carpet. The start of the installation of carpet shall be an indication of the Contractor's acceptance of the surfaces as being satisfactory for installing the carpet, and he will automatically assume the responsibility for any unacceptable finished work caused by surface conditions.

3.02 SCHEDULING

- A. All new carpet scheduled for installation shall be allowed to "rest" prior to installation. Carpet to be unrolled (off-site) in a well-ventilated area for minimum of 48 hours prior to installation.

3.03 PREPARATION

- A. Floors should be free of dust, grease, oil, and dirt and thoroughly dry.
- B. Fill all cracks and holes or depressions with a floor preparation material. Fill, sand off all high points. The base to receive carpet must be smooth.

3.02 INSTALLATION

- A. Carpeting: Wall-to-Wall carpeting shall be installed in accordance with THE HANDBOOK FOR CARPET LAYERS, published by the Carpet Institute, Inc. over a level surface.
- B. Indoor Air Quality Installation Guidelines:
 - 1. Carpeting installation to follow the installation guidelines (CRI 105) established by the Carpet and Rug Institute (CRI). They provide the installer with guidelines of what to do before, during and after installation regarding environmental requirements.
 - 2. Open windows, doors, etc. if possible, for adequate supply of fresh air. Consider using window fans, room air conditioning units, or other means to exhaust chemicals to the outdoors during the installation of new carpet.
 - 3. Continue operating ventilation system at normal room temperature for 48-7 hours after installation. If possible, leave doors and windows open to increase airflow.
- B. All carpeting work shall be done as recommended by the manufacturer of the carpeting materials using fastening and seaming methods approved by the manufacturer.
- C. Protect edges of carpeting at doorways with metal binder strip.
- D. Where carpet and ceramic tile come together, float carpet to tile using floor transition material to make a smooth transition so that top of carpet is flush with the top of the ceramic tile. Contractor to verify ceramic tile installation height. Install floor transition material (model) required to accommodate specific transition height.
- E. Install floor transition material and adhesive per manufacturer's instructions.

3.04 CLEANING AND PROTECTION

- A. Install during latter stage of construction so that no damage to the goods will occur by other trades.
- B. Coordinate with the General Contractor to provide necessary protection of the carpet during the final phases of the project.
- C. Monitor the condition of the carpet, and repair any damage/soiling that occurs after installation prior to final completion of the project at no cost to Owner.
- D. Upon Completion of the installation, the contractor shall remove all waste and excess materials, all tools and equipment, and shall carefully and thoroughly vacuum the entire new carpeted floor surface with an upright beater-bar type vacuum cleaner to the Architect's satisfaction.
- E. Upon completion, provide and review manufacturer's written maintenance procedures with Owner Representative.

END OF SECTION



SECTION 09900

PAINTING

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Painting, Finishing and Preparation for Painting and Finishing.
- B. Related Work Specified Elsewhere:
 - 1. Structural Steel: Section 05120
 - 2. Finish Carpentry: Section 06200
 - 3. Cabinet Work: Section 06410
 - 4. Sealants: Section 07900
 - 5. Metal Doors and Frames: Section 08100
 - 6. Wood Doors: Section 08210
 - 7. Access Doors: Section 08305
 - 8. Panel Folding Doors: Section 08351
 - 9. Gypsum Wallboard Systems: Section 09260
 - 10. General Provisions, Mechanical: Section 15010
 - 11. General Provisions, Electrical: Section 16010

1.02 QUALITY ASSURANCE

- A. All paint products shall be "top of the line" quality. Materials not displayed in manufacturer's identification as a standard best-grade product will not be acceptable.

1.03 SUBMITTALS

- A. Submit samples of all paint types to Architect for approval in accordance with Section 01300.
- B. See Paint Code Schedule on drawings for paint manufacturer, type, color, etc.

1.04 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. All paints shall be ready mixed and shall be delivered to the job in unopened containers bearing the manufacturer's label specifying his name and the quality, grade and description of contents.
- B. Store materials in a single place as approved by the Architect. Keep storage area neat and clean and make good any damage thereto or to surrounding areas. Remove oily rags, waste, etc. from buildings every night and take every precaution to avoid the danger of fire.

1.05 PROJECT CONDITIONS:

- A. Renovation: In renovation projects where building occupants or employees are on site during normal operating business hours, all interior solvent based paint materials to be applied only on weekends. If paint odors or residue persist upon commence of normal business operation. Contractor to provide fans of sufficient size and quantity to provide additional ventilation and to reduce odors below detectable levels.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Interior Latex Primer Sealer
- B. Latex Flat Wall Paint
- C. Latex Eggshell Wall Paint
- D. Galvanized Metal Primer
- E. Ferrous Oil Primer
- F. Alkyd Semi Gloss Enamel
- G. Ferrous Metal Primer
- H. Latex Semi-Gloss Enamel
- I. Interior Semi Transparent Oil Stain
- J. Sanding Sealer
- K. Gloss Polyurethane
- L. Satin Polyurethane
- M. Exterior Latex Primer Sealer
- N. Acrylic Latex Primer
- O. Acrylic Latex Semi Gloss
- P. Exterior Latex Semi Gloss Enamel
- Q. Water Based Catalyzed Epoxy

PART 3 - EXECUTION

3.01 INSPECTION

- A. Examine all surfaces to be painted and notify the Architect of any conditions that will adversely affect the satisfactory execution and permanency of the work. Do not start work until such conditions have been corrected.
- B. Surface Conditions:

The Painting Contractor shall inspect all surfaces to receive paint and notify the General Contractor prior to installation of new paint if the condition of the surfaces is found to be unacceptable. Failure of the Painting Contractor to provide this notification and with the commencement of application of paint, the Painting Contractor accepts the condition of the surface as being ready to receive paint. Correction of any defects or deficiencies in paint application attributable to surface conditions will be the responsibility of the Painting Contractor.

3.02 PREPARATION

- A. The Contractor shall protect all other surfaces not included in the specific area being painted, including objects inside and outside of buildings, as well as sidewalks, drives, floors, etc. from damage or injury by employees, damage due to misapplication of paint products or due to other operations that may be performed by the Contractor.
- B. In the event that switch and receptacle plates, hardware, toilet room accessories, escutcheons and other finished items are in their final positions before painting is started, they shall be removed and later replaced upon the completion of the painting by their erector. Apply no paint until these items have been removed.
- C. Before applying any paint, thoroughly clean and prepare all surfaces. Surface shall be free of any foreign material that will adversely affect adhesion or appearance of applied coating.

- D. No greater area shall be cleaned at one time than can be coated with the required prime coat within the same day, except where drying time is required or adequate protection.
- E. Mildew shall be removed and neutralized by scrubbing affected areas thoroughly with a solution made by adding two (2) ounces of tri-sodium phosphate and eight (8) ounces of sodium hypochloride (clorox) to one gallon of warm water. Use a scouring powder if necessary to remove mildew spores. Rinse with clean water and allow to dry thoroughly before painting.
- F. Efflorescence showing on any area scheduled to be painted shall be scrubbed off with a commercial lime solution or one (1) part commercial muriatic acid to five (5) parts water and then rinse with clean water and allow surface to thoroughly dry before painting.
- G. Steel Surfaces
1. Thoroughly clean all welds, abraded or otherwise defective areas in prime coats with power brushes removing defective or burned paint, etc. by washing with suitable degreasing solvent and wiping dry with a clean cloth or waste.
- H. Galvanized Metal Surfaces
1. All galvanized surfaces that have not been previously treated for painting shall be thoroughly washed with thinner to remove any oily residue, grease, dirt, etc., then pretreated with proprietary acid-bound resinous or crystalline zinc phosphate preparations, used according to the manufacturer's directions, prior to painting, unless manufacturer of primer used directed otherwise.
- I. Non-Ferrous Metals
1. Neither surface preparation nor paint finish shall be given to non-ferrous surfaces, such as stainless steel, aluminum, chrome, copper, brass, etc. Care shall be taken to keep paint off such surfaces and in the event of spatter or paint drip, remove promptly, clean and restore to original finish.
- J. Stucco Surface
1. Thoroughly clean to remove all loose stucco, grease and other foreign deposits. Fill cracks, voids and pockets with mortar.
- K. Gypsum Wallboard
1. Fill all minor irregularities with spackling compound and sand to a smooth level surface.
- L. Wood
1. Remove splinters and rough spots, fill voids and nail holes and sand as required.
- M. Molded Architectural Wood Work
1. Fill all minor irregularities with filler compound approved by manufacturer, sand to a smooth level surface.
- N. Cementitious Siding or Trim Work

1. Fill all minor irregularities with filler compound approved by manufacturer, sand to a smooth level surface.

3.03 PERFORMANCE

- A. All paint shall be applied by skilled, experienced mechanics under competent and constant supervision.
- B. Doors: All surfaces including face, applied trims, panels, top edges, bottom edges, side edges, etc. shall be sealed, primed, and painted (or stained) or otherwise prepared as noted below for the material specified and as indicated on the Drawings - See Door Schedule.
- C. All wood trim (interior or exterior) scheduled to be painted shall be "back-painted" prior to installation and application of final finish.

3.04 SCHEDULE

- A. The following schedule shall be construed as the general guide for the complete painting and finishing of the building.

1. TYPE A

Exterior steel not concealed in the construction, including structural items, hollow metal frames, mechanical equipment.

First Coat:	Ferrous Metal Primer
Second Coat:	Alkyd Semi Gloss Enamel
Third Coat:	Alkyd Semi Gloss Enamel

2. TYPE B

Exterior galvanized steel not concealed in the construction, including hollow metal doors, door frames, flashing items, mechanical equipment:

First Coat:	Acrylic Primer
Second Coat:	Acrylic Latex Semi-Gloss
Third Coat:	Acrylic Latex Semi-Gloss

3. TYPE C

Exterior aluminum surfaces not concealed in the construction, including hollow metal doors, doorframes, roof flashing items include flashings, valley flashings, counterflashings, drip edges, eave treatments, roof vents. etc., mechanical equipment:

First Coat:	Acrylic Primer
Second Coat:	Acrylic Latex Semi-Gloss
Third Coat:	Acrylic Latex Semi-Gloss

4. TYPE D

Interior steel items, exposed to view, including structural items below ceiling line, railings, hollow metal frames, steel ladders, steel brackets, exposed piping and supports, over shop coat.

First Coat:	Ferrous Metal Primer
Second Coat:	Alkyd Semi Gloss Enamel
Third Coat:	Alkyd Semi Gloss Enamel

5. TYPE E

Interior Gypsum Wallboard.

First Coat:	Interior Latex Primer Sealer
Second Coat:	Eggshell
Third Coat:	Eggshell

6. TYPE F

Interior Gypsum Wallboard

First Coat:	Interior Latex Primer Sealed
Second Coat:	Latex Flat
Third Coat:	Latex Flat

7. TYPE G

Interior Gypsum wallboard at Janitor's Closet or other high moisture locations.

First Coat:	Water-based Catalyzed Epoxy
Second Coat:	Water-based Catalyzed Epoxy

8. TYPE H

Interior Wood: Doors, casings, trim, jambs (painted finish).

First Coat:	Interior Latex Primer Sealer
Second Coat:	Latex Semi-gloss Enamel
Third Coat:	Latex Semi-gloss Enamel

9. TYPE J

Transparent Finish on Interior Wood other than oak: countertop edges

First Coat:	Oil Wood Stain (after initial sanding)
Second Coat:	Sanding Sealer
Third Coat:	Clear Polyurethane - Gloss
Fourth Coat:	Clear Polyurethane - Satin

10. TYPE K

Applied Foam Trims

UnPrimed Materials

First Coat:	Exterior Acrylic Latex Primer Sealer
Second Coat:	Exterior Acrylic Latex
Third Coat:	Exterior Acrylic Latex

PrePrimed Materials

First Coat:	Factory Primed
Second Coat:	Exterior Acrylic Latex
Third Coat:	Exterior Acrylic Latex

END OF SECTION

SECTION 09950

VINYL WALLCOVERINGS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. All Interior Vinyl Wallcovering.
- B. Related Work Specified Elsewhere:
 - 1. Gypsum Wallboard Systems: Section 09260
 - 2. Painting: Section 09900

1.02 QUALITY ASSURANCE

- A. Vinyl wallcovering shall meet or exceed the requirements of Federal Specifications CCC-W-408A.
- B. Vinyl wallcovering shall meet ASTM E84 (Tunnel Test) Specifications with Class A flame, fuel and smoke ratings of 25, 10 and 5.

1.03 SUBMITTALS

- A. Submit samples of all wall covering to Architect for approval in accordance with Section 01300.

1.04 MAINTENANCE

- A. Extra Materials: Provide extra materials equal to 5% of each type and color wallcovering specified for Owner's maintenance.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. See Vinyl Wallcovering Code Schedule on drawings for wallcovering manufacturer, type, style, color, etc.
- B. Adhesives: Strippable and mildew resistant type recommended by wall covering manufacturer for substrate encountered.

PART 3 - EXECUTION

3.01 SURFACE PREPARATION

- A. New Construction: The Wallcovering Contractor shall see that surfaces present a true, smooth, level finish free from cracks, dirt, dust, irregularities, rough spots and indentations. The walls are thoroughly dry before application. An oil base primer shall be used on new drywall to ease possible future removal.

Caution: Pigmented primers could bleed through the wall covering. For best results, use shellac or non-pigmented oil base primer.

- B. Renovation: The Wall Covering Contractor shall check wall surface after removal of existing wall finish to determine if wall is structurally sound, smooth, clean, and dry. Enamel paint should be dulled with fine sandpaper and rinsed with warm water. All painted surfaces should be checked for possibility of pigment bleed through.

- C. Surface Conditions:

The Wall Covering Contractor shall inspect all surfaces to receive wall covering and notify the General Contractor prior to installation of new wall covering if the condition of the surfaces is found to be unacceptable. Failure of the Wall Covering Contractor to provide this notification and with the commencement of installation, the Wall Covering Contractor accepts the condition of the walls as being ready to receive wall covering. Correction of any defects or deficiencies in wall covering installation attributable to surface conditions will be the responsibility of the Wall Covering Contractor.

3.02 APPLICATION

- A. Before cutting, examine pattern and color and determine that they match approve samples. Examine patterned material for repeat in design.
- B. Adhesive shall be used by the wallcovering contractor and material shall be hung in accordance with manufacturer's written instructions.
- C. Cut material in consecutive bolt sequence, starting with highest numbered bolt going to the lowest number bolt.
- D. Use panels in exact order as they cut from the roll; and reverse every other panel on solid colors and non-matching textures where required.
- E. Fill in over doors and windows as you come to them with panels cut in consecutive order from the roll.
- F. Smooth fabric to hanging surface with stiff bristled sweep brush or a flexible broad- knife to eliminate air bubbles and insure adhesion.
- G. Vertical joints shall not occur less than 6" from outside or inside corners.
- H. Where applicable, install wallcovering before installation of plumbing, casing, bases, cabinets, etc.
- I. After applying three strips, if there are any variations in color and/or pattern match, this shall be immediately communicated to the Architect for his inspection before proceeding further with installation.

3.03 CLEANING

- A. Remove excess adhesive from wallcovering surface, seams and adjoining surfaces immediately, using sponge or damp cloth frequently rinsed in clean, warm water. Dry with towel.
- B. Upon completion of the work, remove surplus materials, rubbish and debris resulting from the operations under this section, including equipment and implements of service, and leave the entire structure and site in-so-far as the work of this section is concerned in a neat, clean acceptable condition.

END OF SECTION

DIVISION 10 SPECIALITIES

SECTION	10400	IDENTIFYING DEVICES	1 THRU 2
SECTION	10522	FIRE EXTINGUISHERS, CABINETS & ACCESSORIES	1 THRU 2
SECTION	10670	STORAGE SHELVING	1 THRU 1
SECTION	10800	TOILET AND BATH ACCESSORIES	1 THRU 1



SECTION 10400

IDENTIFYING DEVICES

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Room name signs
- B. Building Address

1.02 SUBMITTALS

- A. Submit samples to Architect for approval in accordance with Section 01300.

1.03 STATE AND FEDERAL REQUIREMENTS

- A. All building signage shall comply with the requirements of both the Florida of Building Codes and Standards - Accessibility Requirements Manual (Florida State Handicapped Code) and the Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities (ADA).

PART 2 - PRODUCTS

2.01 MATERIALS - ROOM SIGNS

- A. Room name signs shall be dye-cut typography utilizing-Helvetica Med. Letters with 1/8" acrylic plastic background. Signs shall be matt finish with rounded corners as manufactured by Innerface Architectural Signage, 5320 Webb Parkway, Lilburn, Georgia 30247 or approved equal.

All signs to be same size through facility.

Letter color and background color to be selected by Architect.

1. Spaces requiring signs:	Sign Image:
a. Men (#105)	Pictogram - Man and wheelchair
b. Women (#105)	Pictogram - Woman and wheelchair
c. Employee Lounge (#107)	Room Name (only - no room number)
d. Janitor (#108).	Room Name (only - no room number)

(Space Numbers are for reference only. Not Part of sign image)

- B. Character Proportions:

Letters and numbers shall have a width-to height ratio of 3:5 and 1:1 and a stroke width-to-height ratio between 1:5 and 1:10, utilizing an uppercase "X" for measurement.

- C. Tactile Characters or Symbols:

Characters, symbols, or pictographs on tactile signs shall be raised 1/32 inch minimum. Raised letters and numbers shall be sans serif upper case characters and shall be accompanied with Grade 2 Braille. Raised characters or symbols shall be at least 5/8"

high, but no higher than a nominal 2". Pictograms shall be accompanied by the equivalent verbal description placed directly below the pictogram. The border dimensions of the pictogram shall be at least 6" minimum in height.

- D. Building Address: Individual numbers are to be 1/8" thick, "black" aluminum numerals with two countersunk screws per unit. Provide shields for installation in masonry substrates. Verify required minimum height (6" minimum) with local fire department.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Mounting Height & Location:

Where room names or numbers are provided, raised or recessed numbers shall be used. Such names or numbers shall, whenever possible, be located adjacent to the door on the latch side at a height of 60" above finish floor to the center of the sign. Where there is no wall space to the latch side of the door, including at double leaf doors, signs shall be placed on the nearest adjacent wall. Mounting locations for such signage shall be so that a person may approach within 3" of signage without encountering protruding objects or standing within the swing of a door.

Where there is no wall space to the latch side of the door, and the nearest adjacent wall on the latch side is not available, final location of the sign must be per the direction of the local building officials.

- C. Install units plumb and level in selected locations with double side adhesive tape in accordance with manufacturer's directions.
- D. Install building address numerals at location as directed by Owner.

END OF SECTION

SECTION 10522

FIRE EXTINGUISHERS, CABINETS & ACCESSORIES

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Fire Extinguisher Cabinets
- B. Portable Fire Extinguisher and Mounting Hardware
- C. Related Work Specified Elsewhere:
 - 1. Gypsum Board Systems: Section 09260

1.02 QUALITY ASSURANCE

- A. Conform to NFPA 10 requirements for portable fire extinguishers.
- B. Provide fire extinguishers, cabinets and accessories by single manufacturer.

1.03 SUBMITTALS

- A. Submit manufacturer's product data and cut sheets to Architect for approval in accordance with Section 01300.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Acceptable Manufacturer: Larsen's Manufacturing Co. 7421 Commerce Lane N.E., Minneapolis, MN 55432, (612) 571-118, or approved equal.
- B. Fire Extinguisher Cabinets:

MINIMUM WALL DEPTH - 4 INCHES

- 1. Where indicated on the drawings, provide Larsen's "Gemini" Series, Model G2409-6R, 2 1/2" rolled edge, with white acrylic door and black vertical letters. Cabinet and trim to be fabricated from heavy gauge steel with white baked enamel finish.
- C. Fire Extinguisher:
 - 1. Dry Chemical Type: Larsen's MP Series, Model No. MP10, UL Rating 4A-60BC.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Install cabinets in accordance with manufacturer's printed instructions for types of installations required. Anchor cabinets to adjacent construction. Install cabinets

level, true to plane and in perfect operating condition. Repair or replace any damaged material or finishes.

- B. All fire extinguishers shall be filled and certified by the Contractor.
- C. Mounting height not to exceed five feet to top of cabinet.

END OF SECTION

SECTION 10670

STORAGE SHELVING

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Vinyl coated ventilated steel rod shelving.
- B. Anchoring devices and support hardware.
- C. Related Work Specified elsewhere:
 - 1. Rough Carpentry: Section 06100
 - 2. Finish Carpentry: Section 06200

1.02 SUBMITTALS

- A. Submit shop drawings and samples to Architect for approval in accordance with Section 01300.

PART 2 - PRODUCTS

2.01 MATERIALS

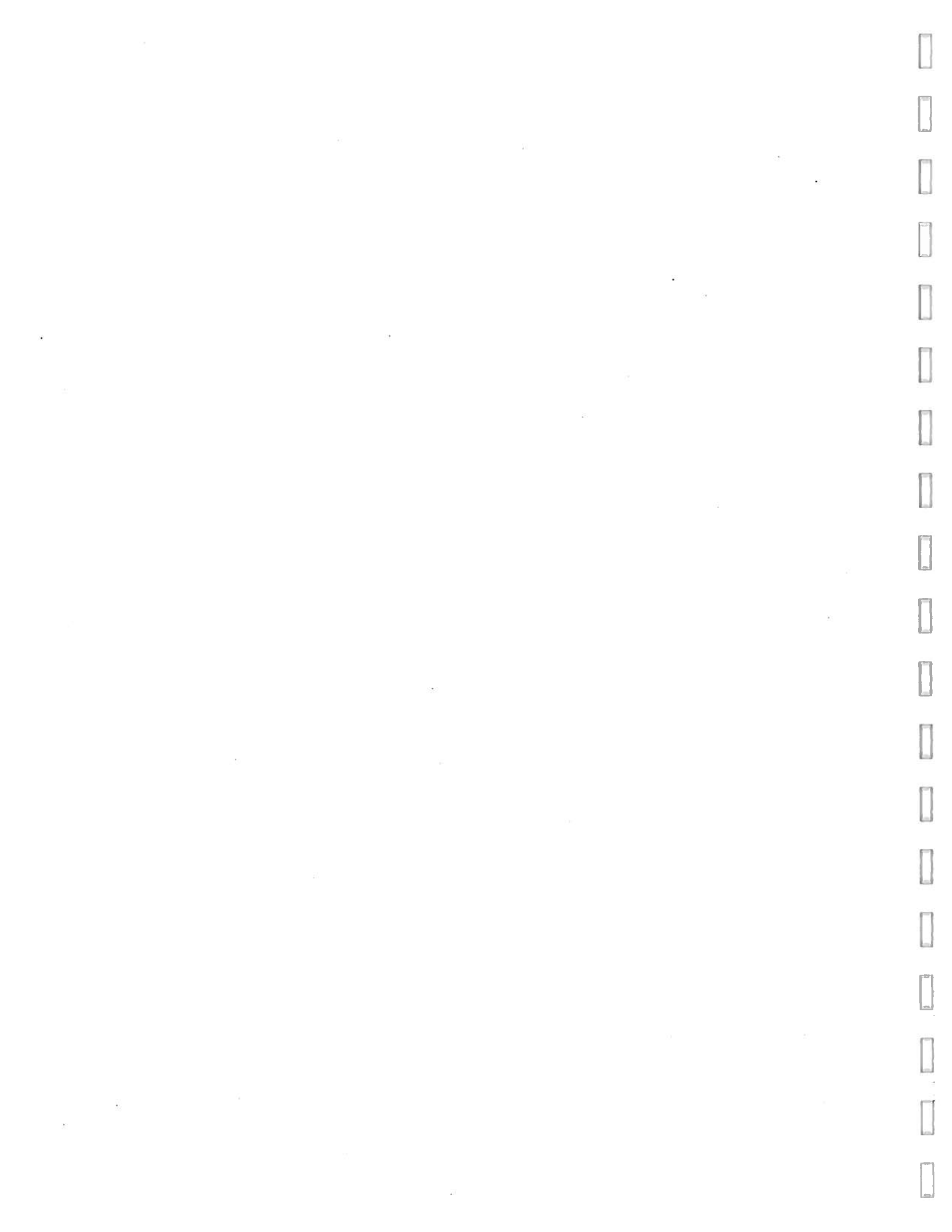
- A. All metal shelves and integral rods shall be fabricated of heavy gauge welded steel rod with deck rod spacing having maximum distance of 1 1/8" between centers. All mounting hardware shall be of hi-tensile engineered plastic with intermediate supports.
- B. Finish: White metal shall be cleaned and primed before coating to insure a perfect bond of vinyl to the steel. Vinyl-coating must bridge the intersections of the welded cross wires, providing a continuous coating.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Provide intermediate support brackets for spans of 3'-6" in length and over 4'-0" span for linen/storage shelf.
- B. Install all shelves level and true and anchored securely.

END OF SECTION



SECTION 10800

TOILET AND BATH ACCESSORIES

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Public Toilet Room Accessories
- B. Related work specified elsewhere:
 - 1. Rough Carpentry: Section 06100
 - 2. Gypsum Wallboard Systems: Section 09260

1.02 SUBMITTALS

- A. Submit manufacturer's product data and cut sheets for all items to Architect for approval in accordance with Section 01300.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Toilet and Bath accessories as listed on the drawings in the "Accessory Code Schedule".

PART 3 - EXECUTION

3.01 INSTALLATION

- A. All accessories shall be installed level and secure using manufacturer's standard mounting devices suitable for wall construction, and heavy duty loading conditions.
- B. Contractor shall provide dead wood blocking behind drywall for mounting of accessories.
- C. All exposed screws or bolts shall be vandal resistant.
- D. Provide anchors suitable for wall types. Use toggle bolts in masonry. Bolt to steel and/or wood backer plates as required in stud walls.
- E. Grab bars shall be installed to sustain a dead weight of 250 lbs. for five (5) minutes.

END OF SECTION



DIVISION 11 EQUIPMENT

SECTION	11030	TELLER AND SERVICE EQUIPMENT	1 THRU 1
SECTION	11100	BANK AND VAULT EQUIPMENT	1 THRU 1
SECTION	11452	APPLIANCES	1 THRU 1



SECTION 11030

TELLER AND SERVICE EQUIPMENT

PART 1 - GENERAL

1.01 DESCRIPTION

- A. The General Contractor shall familiarize himself with bank equipment to be provided and installed by outside vendors as indicated in the drawings and the Manufacturer's shop drawings.
- B. The General Contractor shall meet with the bank equipment supplier representative and develop an overall project schedule and indicate the dates of delivery and installation of the bank equipment. These dates shall be shown on the overall construction progress chart, and shall be updated on a monthly basis.
- C. The General Contractor shall plan his work in concert with the delivery dates and time required for installation of bank equipment.

PART 2 - PRODUCTS

- A. None.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. The General Contractor's duties shall include but not be limited to the following:
 - 1. The provision of necessary on-site facilities for sanitation, parking, access to the building, temporary power, temporary lights, etc. to facilitate bank equipment installation.
 - 2. Coordination with the bank equipment supplier for the delivery, receipt and on-site storage of bank equipment prior to installation.
 - 3. The excavation, leveling, placement of fill and covering of bank equipment and the temporary shoring and bracing of bank equipment items prior to concrete placement.
 - 4. The placement of necessary rough-in and dap-out or embed items in the bank vault. Have all embedded items reviewed by the bank equipment supplier prior to concrete placement.
 - 5. The installation of necessary conduit, wiring and home-run connections to serve bank equipment.

END OF SECTION



SECTION 11100

BANK EQUIPMENT

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Provide for coordination of equipment with manufacturer. Installation shall be as shown or as specified.
- B. Coordinate for all connections to equipment, electrical, mechanical, floor drains, plumbing, etc.
- C. The Owner will purchase all bank and vault equipment under a separate contract.

1.02 STORAGE AND HANDLING

- A. The Contractor shall receive and store the required bank equipment and be responsible for coordinating installation with equipment supplier.

PART 2 - PRODUCTS

- A. None.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. The Contractor shall coordinate the installation of bank equipment with the supplier to insure proper installation and compliance with all applicable banking regulations.
- B. All prefabricated items shall be installed to provide a complete finished structure in accordance with good trade practices and the manufacturer's recommendations.

END OF SECTION



SECTION 11452

APPLIANCES

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Refrigerator and Microwave Oven
- B. Microwave mounting kit (if required)

1.02 SUBMITTALS

- A. Submit product data to the Architect for approval in accordance with Section 01300.

1.03 DELIVERY, STORAGE AND HANDLING

- A. Deliver specialties in protective packaging.
- B. Store in packaging to prevent soiling and physical damage.
- C. Handle to prevent damage to finished surfaces and operating mechanisms.

PART 2 - PRODUCTS

2.01 MANUFACTURED UNITS

- A. Refrigerator shall be "General Electric", Model #GTS18FBMWW equipped with factory installed icemaker. Color to be "White".
- B. Microwave Oven shall be "General Electric", SpaceMaker II, Model #JEM25WY. Color to be "White". Provide Under-Cabinet Mounting Kit Pub No. 4-A019.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Install appliances in accordance with manufacturer's product data, plumb, level, and true to line and location.

END OF SECTION



DIVISION 12 FURNISHINGS

SECTION	12501	HORIZONTAL LOUVER BLINDS	1 THRU 2



SECTION 12501

HORIZONTAL LOUVER BLINDS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Horizontal blinds at all windows
- B. Related work specified elsewhere:
 - 1. Metal Fabrications: Section 05500

1.02 SUBMITTALS

- A. Submit samples to Architect for approval in accordance with Section 01300.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. See Window Treatment Schedule for manufacturer, color, style, etc.
- B. The horizontal blinds shall have 2" wide wood slats supported by braided ladders and shall tilt to any angle by means of tilt rod. It shall be possible to raise and lower slats to any height by means of lift cords. The head channel shall be treated steel, with rolled edges at the top, coated with vinyl primer and polyester baked enamel coat. Operating hardware shall be locked into head channel with no mechanical cleats visible from underside of headrail.
- C. The horizontal blinds shall be equipped with steel channel headrail, enclosed metal bottom rail, tilt wand, lift cord, end support brackets, intermediate support brackets for blinds over 60" wide and end stiffeners, cord, cord lock, drum and cradle, tilt rod, end braces, installation brackets, braided ladders and wood slats and matching wood valance (manufacturer's standard valance).

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Blinds shall fit the opening in accordance with Manufacturer's installation procedures.
- B. Install blinds with adequate clearance to permit smooth operation.

INSIDE MOUNTED

- D. For windows on exterior walls, a lock-out device shall be provided to prevent blinds from being completely closed. The rotation of blinds shall be limited to a position of 60° off horizontal when they are in the most closed position.
- E. Demonstrate blinds to be in smooth, uniform working order.

- F. Protect installed units to insure their being in perfect operating condition, without, damage, blemishes or indication of use at completion of project. Repair or replace damaged units as directed by Architect.
- G. All blinds installed adjacent to a gypsum board/plaster jamb are to be provide with nominal clearance from jamb as recommended by the blind manufacturer for smooth operation. Blinds located adjacent to vertical mullions of windows or storefronts are to be installed so that the end of each blind or group of blinds shall align with the centerline of the vertical mullions.

END OF SECTION

DIVISION 15 MECHANICAL

SECTION	15010	GENERAL MECHANICAL PROVISIONS	1 THRU 11
SECTION	15050	BASIC MECHANICAL MATERIALS & METHODS	1 THRU 10
SECTION	15062	REFRIGERATION, PIPING, VALVES & SPECIALTIES	1 THRU 4
SECTION	15151	HANGERS & SUPPORTS	1 THRU 4
SECTION	15201	VIBRATION ISOLATION EQUIPMENT	1 THRU
SECTION	15400	PLUMBING	1 THRU 3
SECTION	15401	SANITARY SEWER, STORM WATER & SANITARY VENT PIPING	1 THRU 5
SECTION	15402	DOMESTIC COLD & HOT WATER SUPPLY PIPING	1 THRU 4
SECTION	15421	FLOOR DRAINS	1 THRU 2
SECTION	15423	CLEAN-OUTS & CLEAN-OUT ACCESS COVERS	1 THRU 2
SECTION	15450	PLUMBING FIXTURES AND TRIM	1 THRU 3
SECTION	15460	VALVES, COCKS, & SPECIALTIES FOR PLUMBING SYSTEMS	1 THRU 5
SECTION	15465	INSULATION FOR PLUMBING SYSTEMS	1 THRU 3
SECTION	15672	AIR COOLED CONDENSING UNITS, SEMI-HERMETIC	1 THRU 3
SECTION	15852	AIR HANDLING UNITS, SPLIT SYSTEMS	1 THRU 4
SECTION	15866	FANS: CENTRIFUGAL, CEILING MOUNTED	1 THRU 2
SECTION	15890	DUCTWORK	1 THRU 11
SECTION	15897	FILTER ACCESSORIES	1 THRU 2
SECTION	15910	DUCT SYSTEM ACCESSORIES	1 THRU 5
SECTION	15936	AIR DISTRIBUTION DEVICES	1 THRU 4
SECTION	15981	PERFORMANCE VERIFICATION	1 THRU 7



SECTION 15010 - GENERAL MECHANICAL PROVISIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SCOPE OF DIVISION

- A. Work shall include all materials, equipment and labor necessary for a complete and properly functioning mechanical installation in accordance with all applicable codes, and contract drawings and specifications. Work shall include all work specified in Division-15 Mechanical, Section numbers 15000 through 15999.
- B. Pay for all required licenses, fees, inspections and permits.

1.3 RELATION TO OTHER WORK

- A. Work Not in Division-15: Related work not included in this division consists of requirements given in the following as may be included in the contract documents:
 - 1. Other divisions which may include work (such as concrete, steel, painting, ceiling systems, structure and other work) related to the work of Division-15.
- B. Work of Division-15: Any or all sections of Division-15 may include a paragraph or paragraphs under the heading, "Relation to other Work". Where such a paragraph is indicated and work directly related to the section is listed or described, such work shall be considered as relating directly to the indicated section. Any related work (directly related or otherwise) which may be omitted by reference from the "Relation to Other Work" paragraph of such section(s), shall be provided as necessary and required whether or not such work is included by reference. Such listing or description of related work within a section is given only as a convenience to the Contractor; omission of other related sections or described work does not in any way exclude the provision of such work.

1.4 CODES

- A. Install all work in accordance with the latest edition of all applicable regulations and governing codes, including the regulations of the utility companies serving the project.
- B. Where a conflict in code requirements occurs the more stringent requirement shall govern.

1.5 STANDARDS

- A. All equipment and devices shall bear U.L. label, the label of an industry recognized approved testing agency or A.G.A. certification for said item of equipment or device.
- B. All electrical devices must be U.L. approved.

1.6 DRAWINGS

- A. Architectural and structural drawings take precedence over mechanical drawings with reference to the building construction. Mechanical drawings are diagrammatic and indicate the general arrangement and extent of work. Architectural drawings indicate more exactly the desired relationship between diffusers, registers, lighting fixtures, equipment, electric panels and devices, plumbing fixtures, and other items which remain exposed in the completed building. Exact locations and arrangement of materials and equipment shall be determined, with the acceptance of the Architect/Engineer, as work progresses to conform in the best possible manner with the surroundings and with the adjoining work of other trades. Where locations of equipment, devices or fixtures are controlled by architectural features, establish such locations by referring to dimensions on Architectural drawings and not by scaling drawings.

1.7 DISCREPANCIES

- A. In case of differences between drawings and specifications, or where drawings and specifications are not clear or definite, the subject shall be referred to Architect/Engineer for clarification and instructions.

1.8 ELECTRICAL PROVISIONS

- A. Work of Division-15 shall include the electrical requirements which are indicated to be integral with mechanical work and which can be summarized to include (but not necessarily be limited to) the following:
 - 1. Motors.
 - 2. Motor starters.
 - 3. Wiring from mechanical equipment to electrical work termination (junction box or disconnect switch).
 - 4. Control switch, pilot lights, interlocks and similar devices.
 - 5. Electrical heating coils and similar elements in mechanical equipment.
 - 6. Electrical work specified in Division-15 for the HVAC control system.
 - 7. Drip pans to protect electrical work.
- B. Motors, Starters, Switches: Provide with all motorized mechanical equipment unless otherwise indicated.
- C. Drip Pans: Where possible, do not run mechanical piping directly above electrical (or electronic) equipment which is sensitive to moisture; otherwise provide drip pans under mechanical piping. Locate pan below piping, and extend 6" on each side of piping and lengthwise 18" beyond

equipment. Fabricate pans 2" deep, of reinforced sheet metal with rolled edges and soldered or welded seams; 20 gage copper, or 16 gage steel with 2 oz. zinc finish hot dipped after fabrication. Provide 3/4" copper drainage piping, properly discharged.

- D. Motors: Unless specifically specified otherwise in the section covering the driven equipment (or the equipment drives), motors shall comply with the following:
 - 1. Three Phase: NEMA design B, three-phase, squirrel cage induction type designed for 1800 rpm synchronous speed for operation in 40°C ambient at 1.15 service factor at constant speed on the scheduled voltage. Motors shall be insulated with Class B insulation material and shall be cast iron, drip proof, horizontal foot mounted type with ball bearings. Two speed motors shall be provided as scheduled and shall be two winding type.
 - 2. Single Phase: Squirrel cage induction type designed for 1800 rpm synchronous speed for operation in 40°C ambient at 1.15 service factor at constant speed on the scheduled voltage. Motors shall be insulated with Class B insulation materials and shall be two winding capacitor start type with steel enclosure, drip proof, horizontal foot mount and ball bearings.
 - 3. Electric motors which are designated to be high efficiency type shall also comply with the section describing high efficiency motors.
- E. Scheduled Horsepower: The horsepowers scheduled or specified are those nominal sizes estimated to be required by the equipment when operating at specified duties and efficiencies. If the actual horsepower for the equipment furnished differs from that specified or shown on the drawings, it shall be the Contractor's responsibility to insure that proper size feeders, breakers, starters, etc. are provided at no change in contract price.
- F. Any TEFC motors shall have Class F insulation.
- G. Drip proof protected motors shall have Class B insulation.
- H. Manufacturer: Electric motors, complying with the requirements of this Section and the installation and performance requirements of the plans, by the following manufacturers are acceptable:
 - 1. Reliance Electric
 - 2. Gould Electric
 - 3. General Electric
 - 4. Westinghouse

1.9 ELECTRICAL/MECHANICAL WORK

- A. Definitions: Definitions for the purpose of mechanical/electrical control and power coordination are as follows: (Note: The use of the words, "Provide", "furnish" and "install" are intended only for use in describing the coordination indicated by this paragraph and do not necessarily have the same definitions when used outside of the context of this paragraph.) Any items which do not fall within the scope of this paragraph shall be coordinated as individually specified.

1. "Furnish" means to procure an item and to deliver it to the project for installation.
 2. "Install" means to determine (in coordination with others as necessary) the appropriate intended location of an item and to set and connect it in place.
 3. "Provide" means to both furnish and install.
 4. Power Circuit: Circuit which carries main electric power to apparatus to which the power circuit is connected.
 5. Control Circuit: Circuit which carries electrical signals directing the performance of a controller but which does not carry the main electric power. (See NEC, Section 430-71.) Such circuits shall also include those which serve a dual control and power function (e.g., a line voltage thermostat circuit which both activates and powers a small fan motor).
 6. Controller: A device, or group of devices, which serves to govern, in some predetermined manner, electric power delivered to apparatus to which the controller is connected and includes any switch or device normally used to start and stop a motor. (See NEC, Article 100, Definitions, "Controller", and Section 430-81(a).)
 7. Control Device: A device which reacts to an operating condition (pressure, temperature, flow, humidity, etc.) and which initiates transmission of an electrical control signal which causes operation of a controller or which causes operation of pressure switches, etc.
 8. Auxiliary Control Device: A device (such as a low voltage control transformer, electric relay, etc.) which is located in a control circuit and which carries or responds to (but does not initiate) an electrical control signal initiated by a control device.
- B. Work of Division-15 includes (but is not necessarily limited to):
1. Provide:
 - a. All controllers which are generally manufactured or shipped as integral with Division-15 equipment (such as starters packaged with air cooled chillers, etc.).
 - b. All electric motors and other electrical power consuming equipment (such as electric air heating coils, electric boilers, electric hot water heaters, etc.) which are specified in Division-15.
 - c. All control circuits (including conduit and boxes) from the Division-16 panels to point of use including the necessary circuit breakers.
 - d. All other control circuits, including conduit and boxes.
 - e. All control connections to equipment.

- f. All control connections to controllers, switches, motors and other mechanical systems electrical power consuming equipment (such as electric air heating coils, electric boilers, electric hot water heaters, etc.).
 - g. Auxiliary control devices.
 - h. All control devices (thermostats, pressure switches, flow switches, humidistats, etc.) and make control circuit connections thereto.
 - i. Any and all pneumatic and electronic and electric control devices and electric or pneumatic connections thereto.
2. Furnish:
- a. All controllers which are generally manufactured and/or shipped as separate but companion items to Division-15 equipment (such as centrifugal chiller starters which are matched with the chillers but are not physically an integral part of the chiller assembly.)

C. Work of Division-16 includes (but is not necessarily limited to):

1. Provide:
- a. All power circuits, including conduit and boxes.
 - b. All power connections to controllers, switches, motors and other mechanical systems electrical power consuming equipment (such as electric air heating coils, electric boilers, electric hot water heaters, etc.).
 - c. All remote motor disconnects (remote from the related controller) at all locations required by NEC and connections thereto except those disconnects which are specified in Division-15 to be provided as part of the equipment itself.
 - d. All controllers (except those which are generally manufactured or shipped as separate but companion items to Division-15 equipment such as centrifugal chiller starters).
2. Install:
- a. All controllers which are generally manufactured and/or shipped as separate but companion items to Division-15 equipment (e.g., chiller starters).

1.10 AUXILIARIES AND ACCESSORIES

- A. Include all auxiliaries and accessories for complete and properly operating systems.

1.11 INVESTIGATION OF SITE

- A. Check site and existing conditions thoroughly before bidding. Advise Architect/Engineer of discrepancies or questions noted before bidding.

1.12 ASBESTOS

- A. Should asbestos, or any other hazardous waste material, be encountered during the execution of the work, or should the presence of asbestos or any other hazardous material be suspected, immediately notify the Owner and suspend all work in the affected area. The Owner will activate an assessment study to determine the presence of asbestos, or other hazardous material, and evaluate what condition it is in. Removal of asbestos, or other hazardous material, if required, will be conducted by a qualified Contractor, and will be done under separate contract.

1.13 COORDINATION

- A. Provide all required coordination and supervision where work of this division connects to or is affected by work of others.

1.14 PROVISIONS FOR OPENINGS

- A. Provide all openings required for work performed under Division-15. Provide sleeves or other approved methods to allow passage of items installed under any Section of Division-15.

1.15 INTERRUPTION OF EXISTING SERVICES

- A. Any interruption of existing services shall be coordinated in advance with the Owner's Representative. Shutdown time and duration of critical services shall be decided by the Owner. Contractor shall provide shutoff valves at point of tie-in to minimize downtime.

1.16 CLEANING AND PROTECTION

- A. Ductwork: Keep the interior of the duct system free from dirt and rubbish and other foreign matter. All fan motors, switches, and other items, shall also be protected from dirt, rubbish and other foreign matter during building construction. Thoroughly clean all components of the ductwork and remove all dirt, scale, oil and other foreign substances which may have accumulated during the installation process.
- B. Equipment: All mechanical equipment provided shall be thoroughly cleaned of all dirt, oil, concrete, etc. Any dents, scratches or other visible blemishes shall be corrected and the appearance of the equipment made "like new" and to the satisfaction of the Architect/Engineer.
- C. Upon completion, and before final acceptance of the work, all debris, rubbish, leftover materials, tools and equipment shall be removed from the site.

- D. Protection of Work Until Final Acceptance: Protect all materials and equipment from damage, entrance of dirt and construction debris from the time of installation until final acceptance. Any materials and equipment which are damaged shall be repaired to "as new" condition or replaced at the direction of the Architect/Engineer. Where factory finishes occur and damage is minor, finishes may be touched up. If, in the opinion of the Architect/Engineer the damage is excessive, factory finish shall be replaced to "new" condition.

1.17 SHOP DRAWINGS

- A. Submit shop drawings for all items, services and systems included in the project.
- B. Shop drawings shall clearly show the following:
 - 1. Technical and descriptive data in detail equal to or greater than the data given in the item specification. Indicate all characteristics, special modifications and features. Where performance and characteristic data is shown on the drawings or specified, submitted data shall be provided in a degree which is both quantitatively and qualitatively equal to that specified and shown so that comparison can be made. Present data in detail equal to or greater than that given in item specification and include all weights, deflections, speeds, velocities, pressure drops, operating temperatures, operating curves, temperature ranges, sound ratings, dimensions, sizes, manufacturers' names, model numbers, types of material used, operating pressures, full load amperages, starting amperages, fouling factors, capacities, set points, chemical compositions, certifications and endorsements, operating voltages, thicknesses, gauges and all other related information as applicable to particular item.
 - 2. Exceptions to or deviations from the contract documents. Should Architect/Engineer accept any items having such deviations which are not clearly brought to Architect/ Engineer's attention, in writing, on item submittal, then Contractor is responsible for correction of such deviations regardless of when such deviations are discovered.
- C. Additional Requirements: See specific sections of the Specifications for any additional requirements.

1.18 SHOP DRAWINGS TECHNICAL INFORMATION BROCHURE

- A. Submit within thirty days after Notice to Proceed. Each brochure shall consist of an adequately sized, hard-cover, 3-ring binder for 8-1/2" x 11" sheets. Provide correct designation on outside cover and on spine of binder, i.e., mechanical. All shop drawings shall be submitted at one time; partial submittals will not be accepted.
- B. First sheet in the brochure shall be a photocopy of the "Division-15 Index" for these specifications. Second sheet shall be prepared by the Contractor and shall list Project addresses for this Project for Contractor and all major subcontractors and suppliers.
- C. Provide reinforced separation sheets tabbed with the appropriate specifications section reference number and typed index for each section.

- D. Shop drawing technical and descriptive data shall be inserted in the brochure in proper order on all items. Mark the appropriate specification section or drawing reference number in the right hand corner of each item. Provide complete information, including, but not limited to, wiring and control diagrams, scale drawings showing that proposed substitute equipment will fit into allotted space (indicate all service access, connections, etc.), test data, and other data required to determine if equipment complies fully with the specifications. All typewritten pages shall be on contractor or equipment manufacturer printed letterhead.
- E. At the end of the brochure, provide and insert a copy of the specifications for Division-15 and all addenda applicable to this Division.
- F. Submit not less than six brochures. Provide separate tag marking on an individual copy for the Owner, Architect, Engineer, Contractor, Subcontractor (two copies).
- G. Contractor shall review the brochure before submitting. Submittal information on each item in each brochure shall bear the Contractor's stamp of approval, initials of checker and date checked by him. No request for payment of or substitutions will be considered until brochure has been reviewed by the Contractor and submitted for checking.

1.19 SHOP DRAWINGS FOR PIPING SYSTEMS AND DUCT SYSTEMS

- A. Shop drawings for piping systems and duct systems shall be done on reproducible transparencies and shall be of sufficient scale to verify clearances and equipment locations. Shop drawings shall show all required maintenance and operational clearances required. Cost of shop drawing preparation and reproduction shall be borne by the Contractor. Title drawings shall include identification of project and names of Architect, Engineer, Contractor, subcontractor and/or supplier, date, be numbered sequentially and shall indicate the following:
 - 1. Architectural and structural (as required) backgrounds with room names and numbers, etc., including but not limited to plans, sections, elevations, details, etc.
 - a. Fabrication and Erection dimensions.
 - b. Arrangements and sectional views.
 - c. Necessary details, including complete information for making connections with other work.
 - d. Kinds of materials and finishes.
 - e. Descriptive names of equipment.
 - f. Modifications and options to standard equipment required by the contract.
 - g. Leave blank area, size approximately 4 by 2-1/2 inches, near title block (for Engineer's shop drawing stamp imprint).
- B. In order to facilitate review of drawings, insofar as practicable, they shall be noted, indicating by cross reference the contract drawings, note, and/or specification paragraph numbers where item(s) occur in the contract documents.

- C. Also provide shop drawings, using sepias of the architectural reflected ceiling plans, which indicate locations of the following (to be verified by Contractor): Air distribution devices, sprinkler heads, lights and access panels.
- D. See specific sections of specifications for further requirements.

1.20 AIR HANDLING UNIT AND DUCTWORK CONFIGURATION SHOP DRAWINGS

- A. Air handling unit manufacturer and model or series which has been used as the design basis for this project is indicated. If Contractor elects to submit for approval units which are made by any other manufacturer which is listed as acceptable, the Contractor shall submit a shop drawing for each air handling unit for which he proposes to use a unit which is different than the design basis. Such shop drawings shall meet the following requirements:
 - 1. Be drawn at not less than a scale of $1/4" = 1'-0"$. Contractor may elect to use a larger scale if he desires (i.e., if drawing of unit is at $1/4" = 1'-0"$, $1/2" = 1'-0"$ may be used.).
 - 2. Clearly show all proposed ductwork configuration changes (sizes, routing, and similar differences) which are different in any respect from the Drawings. Extent of shop drawings shall show all ductwork to and from each unit beginning with and terminating at those points where ductwork is intended to remain unchanged as shown on Drawings.
 - 3. Where proposed changes affect any other work such as structure, housekeeping pads, piping, equipment, electrical work or any other work, shop drawings shall clearly show those proposed changes.
 - 4. Proposed changes shall be at no additional change in contract price.
 - 5. Where Drawings show units in plan only, shop drawings shall show proposed units in plan and also in elevation.
 - 6. Shop drawings shall also show exact locations of related work (such as bar joists, columns, beams, sound attenuators, and like items) which affect the proposed ductwork routing and unit location and configuration.
 - 7. Each section of each air handling unit shall be clearly identified (i.e., coil section, fan section, filter section, mixing box section, etc.).
- B. Failure to submit these shop drawings together at the same time with the air handling unit shop drawings will result in total disapproval of the proposed air handling units. Time delays or other reasons will not be considered.

1.21 OPERATING INSTRUCTIONS

- A. Submit for checking a specific set of written operating instructions on each item which requires instructions to operate. After acceptance, insert information in each Technical Information Brochure. Refer also to other sections which may describe operating instructions.

1.22 MAINTENANCE INFORMATION

- A. Submit for acceptance Maintenance Information consisting of manufacturer's printed instruction and parts lists for each major item of equipment. After acceptance, insert information in each Technical Information Brochure. Refer also to other sections which may describe maintenance.

1.23 SYSTEM GUARANTEE

- A. The work required under Division-15 shall include a one year guarantee. This guarantee shall be by the Contractor to the Owner to replace for the Owner any defective workmanship, equipment, or material which has been furnished under this Contract at no cost to the Owner for a period of one year from the date of acceptance of the System. This guarantee shall also include reasonable adjustments of the system required for proper operation during the guarantee period. Explain the provisions of guarantee to Owner at the "Instruction in Operation Conference".

1.24 INSTRUCTION TO OWNER

- A. Submit all required items for checking one week before final inspection of the building is scheduled. When all items are accepted and placed in the proper brochures, the Contractor shall give notice in writing that he is ready to give the Owner an "Instruction in Operation Conference". After the above mentioned request is received the Contractor will be notified of the time the conference can be held with the Owner. At the conference, the Contractor shall review with the Owner all appropriate information. At the end of the conference, seven copies of a memo certifying Instruction in Operation and Completed Demonstration shall be signed by the Contractor, Subcontractor and Owner and one copy inserted in each brochure.

1.25 MATERIALS AND EQUIPMENT

- A. Each bidder represents that his bid is based upon the materials and equipment described in this division of the specifications.
 - 1. Submittal shall include the name of the material or equipment for which it is to be substituted, substituted equipment model numbers, drawings, cuts, performance and test data and any other data or information necessary for the Architect/Engineer to determine that the equipment meets all specification and requirements. If the Architect/Engineer accepts any proposed substitutions, such acceptance will be set forth in writing.
 - 2. Substituted equipment with all accessories installed or optional equipment where permitted and accepted, must conform to space requirements. Any substituted equipment that cannot meet space requirements, whether accepted or not, shall be replaced at the Contractor's expense. Any modifications of related systems of this or other trades as a result of substitutions shall be made at the Contractor's expense, and Contractor shall so state in his written request for substitution.

1.26 ACCEPTABLE MANUFACTURERS

- A. Acceptable Manufacturers: Materials and Equipment specified in these contract documents are accepted only in regards to general performance and quality. It shall be the Contractor's responsibility to insure that acceptable materials and equipment meet or exceed the efficiencies, capacities, electrical characteristics, performance and quality of the equipment herein specified. Acceptable equipment must also generally conform, without extensive modification of related systems to the accessories, weights, space and maintenance requirements, etc., of the specified equipment. Any modification to related systems of this or other trades shall be made at the Contractor's expense and the Contractor shall be responsible for coordination between trades. Any difference in capacity, efficiency, electrical characteristics, weights or quality of product, etc., between specified materials and equipment and acceptable alternates shall be submitted to the Architect/Engineer for acceptance within 30 days of Notice to Proceed.

PART 2 - PRODUCTS

Section part not applicable.

PART 3 - EXECUTION

Section part not applicable.

END OF SECTION 15010



SECTION 15050 - BASIC MECHANICAL MATERIALS AND METHODS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section, in addition to the following:
 - 1. Other divisions which may include work (such as concrete, steel, painting, ceiling systems, structure and other work) related to the work of Division-15.

1.2 SCOPE

- A. Materials listed herein are general mechanical materials to be used under the Division-15 sections of the specifications unless specifically noted otherwise in the particular section or on the drawings.

1.3 RELATION TO OTHER WORK

- A. Refer to the section, "General Mechanical Provisions", for related requirements. Refer to other sections of Division-15 and to all other applicable portions of the Drawings and Specifications. This section relates to all sections of Division-15 as may be applicable to the work of each section.

1.4 STANDARDS

- A. Quality and weight of materials shall comply with requirements and specifications of the appropriate standards of the American Society of Testing and Materials.

PART 2 - PRODUCTS

2.1 MATERIALS AND EQUIPMENT, GENERAL

- A. All materials and equipment shall be new and without blemish or defect.
- B. Equipment and materials shall be products which will meet with the acceptance of the agency inspecting the work. Where acceptance is contingent upon having the products examined, tested and certified by Underwriters Laboratory or other recognized testing laboratory, the product shall be so examined, tested and certified.
- C. Where no specific indication as to the type or quality of material or equipment is indicated, a standard item or system shall be furnished with all options, features and capabilities to meet the project requirements.

D. Performance and Capacity:

1. Performance as delineated in schedules and in the specifications shall be interpreted as minimum performance. In some cases equipment may be sized to allow for future requirements or for other reasons which may not be stated on the Drawings or in the Specifications; provide equipment and systems with the capacities, capabilities and features indicated to provide the maximum or minimum (as appropriate) conditions.

E. Operating conditions and capacities must be as follows:

1. No overloading.
2. No operation at conditions outside of maximum and minimum limits recommended by the manufacturer and accepted by the Architect/Engineer.
3. Compatible with all systems.

F. Unless otherwise specified, all equipment and materials furnished must be as follows:

1. Recommended by the manufacturer for the application.
2. Installed in accordance with the manufacturer's recommendations for the application except where specifications and drawings clearly indicate otherwise.

2.2 ACCESS DOORS AND PANELS

- A. Locations: Provide access doors and panels (access units) as necessary for access to items which are concealed and which may require service or maintenance or other reason for accessibility. Examples of such items include, but are not limited to, the following: valves, cleanouts, pipe unions, expansion joints and connectors, dampers, coils, junction boxes, duct heaters, terminal units, HVAC control system devices and similar types of items.
- B. Access units: Shall be manufactured by the Milcor Division of Inland-Ryerson, Boico, Nystrom or Ventfabrics. Types are as follows (Milcor style designations are used for example only):

<u>Location</u>	<u>Door/Panel Type</u>
Drywall	Style "DW"
Masonry or tile	Style "M-stainless"
Acoustical tile	Style "AT"
Plaster	Style "K"
Fire-rated walls	Style "Fire Rated"***
(**or as indicated below)	

C. Fire Rated Units:

1. Frame and panel assembly shall bear a U.L. label reading, "frame and door assembly, rating 1-1/2-hour (B), temperature rise 30 minutes 250°F maximum".

2. Have an automatic closing device and mechanism to release the latch bolt from the inside.
3. Acceptable Manufacturers: Boico Style F, Inryco/Milcor Style VA, Nystrom Style APFR.

D. Non-fire Rated Units:

1. Steel panels and frames.
2. Locks and latches shall be as appropriate for the location and shall be cam-lock type latches, flush screw driver operated locks or cylindrical locks.
3. Provide two keys for all doors. All doors shall be keyed the same.

E. Other Requirements:

1. Doors and panels installed in glazed or ceramic tiled surfaces, in toilet rooms or in kitchens shall be stainless steel.
2. Unless otherwise indicated, finish shall be rust inhibitive prime coat.

F. Sizes:

1. Minimum size: 8" x 8".
2. Sizes of each unit shall be individually selected to allow the recommended and required service and maintenance and accessibility functions to be accomplished. These functions shall generally include, for example, valve removal, damper linkage resetting, control adjustment, lubrication, repair, replacement and similar tasks as may be necessary and recommended for the concealed item.
3. Sizes shall be of the following increments (unless otherwise approved) to allow the accessibility function to be accomplished: 8" x 8", 8" x 12", 12" x 12", 12" x 16", 16" x 16", 16" x 24", 24" x 24", 24" x 36", 30" x 30", 36" x 36" or 36" x 48".
4. No size smaller than 16" x 24" shall be allowed when a person must pass through the access opening in order to accomplish the desired accessibility function.
5. Every attic or furred space in which mechanical equipment is installed shall be accessible by an opening and passageway as large as the largest piece of the equipment and in no case less than 22 x 36 inches continuous from the opening to the equipment and its controls. The opening to the passageway shall be located not more than 20 feet from the equipment measured along the center line of such passageway.

2.3 PAINTING AND MARKING

- A. All paint and materials used for painting shall be manufacturer's "first quality" product. For additional paint material requirements, refer to Section 09900, Painting.

- B. Marking: Refer also to sections describing identification of mechanical systems.

2.4 PIPE HANGERS AND SUPPORTING DEVICES

- A. General: Refer to other sections of Division-15 for any requirements which may be additional to this section. Comply with the more stringent requirement if more than one method is specified or shown.
- B. Pipe supporting devices specified herein shall apply to all Division-15 piping unless modified in subsequent sections of Division-15 (i.e., vibration isolation) or detailed on the drawings.
 - 1. Pipe hangers for copper pipe shall be copper or copper-plated and for steel pipe shall be zinc-plated, clevis type hangers.
 - 2. Hangers for pressure piping shall be clevis type or accepted as equivalent. Pipe hangers shall be capable of vertical adjustment after erection of the piping. Piping shall not be hung from fire and/or smoke walls.
 - 3. Vertical piping supports shall be constructed of carbon steel with rounded ears and two or four holes for clamping bolts. Steel, galvanized and cast iron piping riser clamps shall have galvanized finish. Copper and brass piping riser clamps shall have electro-plated copper or PVC coating finish.
 - 4. Acceptable Manufacturers are Grinnell, PHD Manufacturing Inc., Fee and Mason, Michigan and Elcen.
- C. Beam clamps may be used when supporting piping from steel structures.
- D. Concrete inserts shall be placed in forms as work of Division-15 prior to the time that concrete is poured.
- E. Lead tamp-ins may be used when installed in a concrete or masonry wall or other like vertical surface to support a vertical hanger. Lead tamp-ins will not be permitted to support hangers to the underside of a concrete slab.
- F. For parallel runs of above ground suspended piping, an acceptable trapeze-type hanger may be used. Provide permanent, non-conductive type wrapping between copper pipe and steel trapeze hangers.
- G. Powder set type fasteners or inserts shall not be used.

2.5 FLOOR, WALL OR CEILING PLATES OR ESCUTCHEONS IN EXPOSED AREAS

- A. Shall be chrome-plated. Escutcheons for extended sleeves shall be of the type designed for that purpose. Split ring escutcheons will not be allowed.

- B. Escutcheons to be as manufactured by Guarantee Specialty Mfg. Co., Cleveland, Ohio; American Sanitary Mfg. Co., Abingdon, Ill., or Beaton Cadwell.
- C. Provide escutcheons or fabricated plates or collars at each location where pipe or duct passes through a finished surface. Escutcheons for flush sleeves shall be equivalent to Benton & Caldwell No. 3A chromium plated brass; for sleeves extending above floor shall be equivalent to Benton & Caldwell No. 36 chrome plated brass. Collars or plates for ducts and large diameter insulated pipe shall be fabricated of 18 gage galvanized copper bearing sheet steel, secured to structure and neatly fitted around duct or pipe.

2.6 SLEEVES

- A. General: Lay out work and set sleeves in new or existing construction so there shall be minimum of cutting, drilling and patching. All sleeves not used during construction period shall be sealed using grout. Unused penetrations or sleeves through fire rated barriers shall be sealed to prevent passage of smoke or heat using an Underwriters' Laboratories approved method rated at least equivalent to the barrier being penetrated. Method submitted must show proof of UL approval.
- B. Pipe Sleeves: Except where specified otherwise below, pipe sleeves shall be as follows:
 - 1. Sleeves installed in walls subject to hydrostatic (water) pressures shall be "link seal" (Thunderline Corp) Type WS or accepted as equivalent.
 - 2. When there is piping existing, and fire rated walls are to be erected, Proset fire rated split wall system pipe sleeves, or accepted equivalent, are to be used.
 - 3. When copper or steel slab penetrations are required, use Proset System A, or accepted as equivalent for fire-rated and water pipe installations.
- C. Walls and Partitions:
 - 1. Sleeves 8-Inch Diameter and Smaller (Above Grade): Sleeves shall be mild steel pipe or plastic sleeves built into wall, partition or beam, sized to pass pipe and covering, leaving a clear space of 1/4-inch minimum between covering and sleeve. Penetrations of fire rated barriers shall have mild steel sleeves.
 - 2. Sleeves Installed in Exterior Walls (Below Grade): Schedule 40 steel hot dipped galvanized after fabrication or cast iron sleeve with 1/4-inch x 3-inch center flange (water stop) around the outside.
- D. Floors (Above Grade): Sleeves shall be Schedule 10 galvanized steel, set before floor is poured, sized to pass pipe and covering, leaving a clear space of 1/4-inch between covering and sleeve, and shall extend 1/2-inch above finished floor.
- E. Duct Sleeves: Sleeves or openings sized to pass mechanical ducts and covering shall be of framed construction in roof, wall, or partitions.

F. Sealing of Sleeves:

1. Sleeves Below Grade: Caulk annular space between pipe and sleeve using oakum and poured lead both sides minimum one inch deep to make wall penetration water tight.
2. Sleeves Above Grade: Openings around pipes, duct, etc., passing through sleeves shall be made draft free and vermin-proof by packing solidly with mineral wool or fiberglass.
3. Sealing of Sleeves Through Fire Rated Barriers: All penetrations through fire rated barriers shall comply with Division-7 or as specified in this Division.

2.7 FIRE/SMOKE RATED FLOOR, PARTITION OR WALL PENETRATION SEALANT

- A. Seal shall be composed of fire barrier product, putty, or caulking materials used either in combination or singularly. Acceptable Manufacturers are 3M Corporation or Dow Corning.

2.8 EXCAVATION AND BACKFILL

- A. Provide as necessary to accomplish work specified. Perform in accordance with applicable State and Local codes and accepted good practice and in accordance with other applicable sections or divisions.

2.9 BELT DRIVES

- A. General: Equip each motor driven machine not direct connected with V-belt drive. Belts shall be of correct cross section to fit properly in sheave grooves and shall be carefully matched for each drive. Sheaves shall be cast iron or steel, bored to fit properly on shafts and secured with keys of proper size. The rating of each drive shall be as recommended by manufacturer for service but shall be at least 1.5 times nameplate rating of motor.
- B. Speed Adjustment: Adjust fan speed by change(s) in sheave size as necessary to obtain proper design air flow with fan in its installed location. Fans may be first fitted with variable pitch drives until proper speed adjustment is made and then fitted with proper fixed pitch drive size, or alternate sizes of fixed pitch drives may be used until proper fan needed to deliver necessary air quantity.
- C. Vibration of Air Handling Equipment and Fan Units: For air handling equipment and fans driven by motors 5-hp or greater, field vibration levels will not be acceptable if the maximum vibration velocity or displacement measurement exceeds the following values (when measurements are taken at the bearing supports using a vibration analyzer with the filter set at the operating fan speed):

Fan Speed

(RPM)

Maximum Vibration Level

800 or Less

5 Mils (0.127 mm) max. displacement

801 and Greater

0.20 in/sec. (5 mm/s) max. velocity

- D. Belt and Coupling Guards: Each belt drive shall be equipped with an OSHA approved guard. Guards shall be constructed of #12 U.S. standard gage 3/4-inch diamond mesh wire screen, or equivalent, welded to one inch steel angle frames, and shall enclose all belts and sheaves. Tops and bottoms of guards shall be of substantial sheet metal or not less than #18 U.S. standard gage. Braces or supports must not "bridge" sound and vibration isolators. Guards shall be designed with adequate provision for movement of motor required to adjust belt tension. Means shall also be provided to permit oiling, use of speed counters, and other maintenance and testing operations with guard in place. All direct drive equipment shall have coupling guards in accordance with Florida Department of Business Regulation safety regulations and OSHA.

2.10 BEARINGS

- A. All bearings shall be 200,000-hour rated unless otherwise specified.

PART 3 - EXECUTION

3.1 EQUIPMENT ACCESS:

A. Access Doors and Panels:

1. Locations: Provide access unit at the following locations.
 - a. Where additionally specified in other sections of this Division-15 and where specifically indicated on the drawings.
 - b. Where not specifically indicated on the drawings but where the work to be provided will require access-ibility for purposes as described or as recommended by the manufacturer of the concealed item.
 - c. At all locations where concealed equipment, fixtures, devices and similar items require accessibility for service, inspection, maintenance, repair, replacement and where such concealed item would not otherwise be accessible for such functions without the provision of an appropriately sized access unit.

B. Installation:

1. Definitions: For the purpose of coordination of responsibility, the following words are defined to describe the intended coordination.
 - a. "Furnish" means to procure an item and deliver it to the project for installation.
 - b. "Install" means to determine (in coordination with others as necessary) the intended appropriate location of an item and to set, connect and otherwise fix in place in a manner to allow intended operation and use.
 - c. "Provide" means to both furnish and install fully and completely in all aspects.

2. **Furnishing Access Units:** Access units shall be furnished as work of the Division which governs the item which is intended to be made accessible by the access unit.
3. **Installing Access Units:** Access units shall be installed as work of the Division which governs the surface, barrier, partition or other building component in and on which the access unit is to be placed.
4. **Determination of Locations:**
 - a. Where the work of Division-15 requires that the access unit be provided (i.e., both furnished and installed), then the responsibility for determination of the location at which the access unit is to be placed is also work of Division-15.
 - b. Where the work of Division-15 requires that access unit be furnished for installation as work of another Division, then the responsibility for determination of the location at which the access unit is to be installed shall be work of Division-15. Conversely, where the work of one Division requires that an access unit be only installed, then the responsibility for determination of the location of which the access unit is to be installed shall be work of Division-15 which furnishes the access unit.
5. **Determination of Sizes:**
 - a. Unless an access unit size is indicated on the drawings or otherwise specified, the size of each access unit shall be determined as work of the Division which either provides or furnishes the access unit.
 - b. Sizes for access units which are provided or furnished as work of this Division shall be in compliance with sizing criteria of this Division.

3.2 PAINTING

- A. Paint all exposed piping, insulation, equipment, structural bases, racks, in equipment rooms and on roof, furnished under Division-15 of these specifications. All exposed metal surfaces shall be given one prime coat and two finish coats. All insulated surfaces shall be given one sizing coat of glue sizing (omit this step if factory applied finish is suitable to receive prime coat), one prime coat and one finish coat. Factory painted or finished items do not require field painting but shall require "touch-up" with matching paint or finish where scratched.
- B. Pipe hangers, saddles, supports, riser clamps and accessories shall be painted to match their piping.
- C. Equipment not completely accessible for painting when set in place shall be thoroughly cleaned and painted before installation and suitably protected.
- D. Piping concealed need not be painted.

3.3 HANGERS AND INSERTS

- A. Refer also to other sections which may describe additional requirements for hanging and supporting. Comply with the more stringent requirement if more than one method is specified or shown.
- B. Provide and properly locate hangers to adequately support piping and equipment. Arrange hangers to permit expansion and contraction.
- C. The size of hanger for non-insulated pipes shall be suitable for pipe size to be supported. For insulated piping, the size of the hanger shall be suitable for the pipe size, plus the insulation and a 16-gauge half-circle galvanized sheet metal insulation saddle.
- D. Isolation of copper pipe from steel hangers to consist of wrapping pipe at, and 1" each side of contact surface with not less than two layers of adhesive type plastic electrical insulating tape.
- E. Pipe supports for piping 2" diameter and below may be supported directly from Epicure steel decking using Epicure standard hangers (200 lb. max. load). Piping above 2" shall be supported from steel beams.
- F. Locate pipe supports as follows unless noted in other sections of these specifications or on the drawings:
 - 1. Horizontal cast iron pipe inside building - supported on each length of pipe.
 - 2. Vertical cast iron pipe inside building - supported at each floor level and at the base.
 - 3. Horizontal steel piping and copper tubing 1" diameter and under - support on 6' centers.
 - 4. Horizontal steel piping and copper tubing above 1" through 1-1/2" diameter - support on 8' centers.
 - 5. Horizontal steel piping and copper tubing larger than 1-1/2" diameter - support on 12' centers, except 24" diameter piping shall be supported by main roof beams (20' O.C. maximum).
 - 6. Support vertical cast iron, steel and copper piping at each floor penetration not to exceed 20 foot intervals.

3.4 ANCHORS

- A. Install a suitable anchor on piping to prevent movement from expansion and contraction by welding or clamping securely to pipe at fitting or coupling. Approval of the Architect/ Engineer of method of anchorage must be obtained before installation of work. Properly anchor piping to remove strains on equipment which would be caused by expansion and contraction. Adequately insulate anchors on piping, with operating fluid temperatures below 75°F, to prevent moisture condensation problems.

3.5 EXPANSION AND CONTRACTION PROVISIONS

- A. Piping is designed with offsets and loops to provide for expansion and contraction. At such points, piping shall be cold sprung to equalize expansion when at operating temperatures. Install piping to maintain grade at all operating temperatures.

3.6 FLASHING

- A. Flashing shall be done as work of other divisions.

3.7 PIPING SLEEVES

- A. Contractor shall furnish and set sleeves for his piping. Use galvanized sheet steel with water tight seams and joints or pipe for poured concrete. Extend sleeves thru walls, partitions and ceilings to finished surface. Extend sleeves 1/4 inch above finished concrete floors and 1 inch above slab in chases. Sleeves, installed above finished ceilings, for fire/smoke rated wall assemblies shall extend 1" beyond each face of wall.
- B. Adequately size sleeves to permit clearance for pipe movement and proper grading of pipes. Sleeves for insulated pipe shall be of adequate size to clear insulation.
- C. Caulk space between insulation or pipe and sleeve with asbestos rope and seal with fire rated safig material (or flexible fire retardant sealant if pipe is subject to expansion or contraction) to serve as a fire and smoke stop.
- D. Sleeves in walls and/or slabs subject to hydrostatic pressures shall be made water tight.

3.8 ESCUTCHEONS

- A. Provide chrome plated brass escutcheons (for 1/4 or 1 inch projecting sleeves as required) at each point where an uninsulated pipe passes thru a finished surface.

3.9 CONCRETE BASES AND STRUCTURAL STEEL

- A. Concrete bases and structural steel to support equipment and piping installed under each specification section or division and not specifically shown on the structural or architectural plans shall be furnished for this work.

3.10 SEALANT

- A. Fire/smoke sealant shall be installed in strict compliance with the manufacturer's installation instructions.

END OF SECTION 15050

SECTION 15062 - REFRIGERANT PIPE, VALVES AND SPECIALTIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SCOPE

- A. Provide refrigerant piping systems, complete in all respects, between the system components and connected equipment.

1.3 RELATION TO OTHER WORK

- A. Refer to the section, "General Mechanical Provisions", for related requirements. Refer to other sections of Division-15 and to all other applicable portions of the Drawings and Specifications.

1.4 SHOP DRAWINGS

- A. Refer to the Section entitled "General Mechanical Provisions".

PART 2 - PRODUCTS

2.1 COPPER PIPE

- A. Refrigerant system piping shall be refrigerant grade, dehydrated and sealed, seamless, uniformly dead soft temper.

2.2 FITTINGS

- A. Refrigerant grade, wrought copper, long radius, solder joint type.

2.3 SOLDER

- A. Silver brazing alloy (Sil Fos) Fed. Spec. AA-S-56ld.

2.4 FLUX

- A. Non-corrosive, specifically designed for silver brazing.

2.5 ACCESS VALVES

- A. Schrader type designed for use with quick coupler hose fittings and provided with individual cap.

PART 3 - EXECUTION

3.1 PIPE SIZES

- A. Refrigerant pipe sizes which may be shown on drawings are nominal. Provide sizes not less than sizes indicated and in compliance with size recommended by the manufacturer(s) at the connected equipment. Provide change in sizes if such change is in accord with manufacturer's recommendation and with Architect/Engineer's approval. Size piping to maintain minimum velocity of 500-fpm in horizontal lines and 1000 fpm in vertical risers for proper oil return; provide double suction risers and hot gas risers as may be necessary to accomplish this.

3.2 REFRIGERANT SPECIALTIES

- A. Refrigerant valves, driers, expansion valves, and similar items shall be provided with each system. Where refrigerant access valves are not furnished by the manufacturer, they shall be field installed to enable charging and checking the system.

3.3 JOINTS AND CONNECTIONS

- A. General: All joints and connections shall be made permanently refrigerant tight.
- B. Solder Joints: Cut tubing square using tubing cutters, with sharp cutting wheels, so as not to crimp the tubing ends. Remove all burrs using a pipe reamer and taking care not to flare the ends of the tube. Thoroughly clean the outside of the pipe and the inside of the fitting using a fine sand cloth. Apply non-corrosive paste flux to the cleaned surfaces immediately and apply silver solder and heat in accordance with manufacturer's instructions. Use care not to damage equipment or refrigerant specialty items when making up joints (protect from excessive heat).
- C. Scale Prevention: During brazing, keep pipe system full of inert gas to prevent scale formation.
- D. Mechanical Joints: Where the Contractor uses refrigerant tubing sets, follow the manufacturer's installation instructions explicitly, including the use of special tools, when making up the joints. Where precharged tubing and equipment is provided, do not cut into the system to install access valves.

3.4 HANGERS AND SUPPORTS

- A. Refer to other sections describing hangers and supports. Isolate copper tubing from contact with any dissimilar metals.

3.5 EVACUATION AND CHARGING

- A. When other than completely factory charged equipment and piping systems are used, they shall be evacuated and charged as follows: Charge the system with dry nitrogen and refrigerant and leak test all joints including factory piping within the units. Repair all leaks by disassembling and remaking the joint. After all leaks are corrected, evacuate the system to an absolute pressure of 0.2" mercury. System shall hold this vacuum for two hours with no noticeable rise in pressure. After passing vacuum test, break vacuum twice using refrigerant and re-evacuate for a minimum of two hours each time. Charge the system in the manner and with the type and amount of refrigerant recommended by the manufacturer and in accordance with accepted refrigeration practice.

3.6 REFRIGERANT PIPING CONDUIT

- A. Install any refrigerant piping which is below slab or grade in Schedule 40 PVC piping. Size conduit as necessary to properly install piping. Provide long bend sweeps. Install so that conduit will drain and not trap water. Protect ends of conduit from entry by vermin, insects and water.

3.7 OTHER REQUIREMENTS

- A. Arrange piping generally as shown and such that service access is facilitated. Keep refrigerant lines as short and direct as possible with a minimum number of joints. Provide sleeves through floors, walls or ceilings, sized to permit installation of full-thickness insulation; seal air tight after installation of piping and insulation.
- B. Provide flexible piping arrangement in hot gas discharge line of compressor. Such arrangement shall consist of a piping loop or similar measure to prevent transmission of objectional vibration.
- C. Provide a removable core filter-drier in liquid line. In-line filter-driers are acceptable in individual circuits of less than 10-ton nominal capacity. Provide a full size valved bypass around this filter-drier. Provide shut-off valves to isolate the filter drier while flow is through the bypass and also a shutoff valve in the bypass so that filter-drier can be put into use.
- D. Provide a refrigerant charging connection in the liquid line upstream from the filter-drier.
- E. Provide a moisture indicating sight glass in the liquid line downstream from the filter-drier. Install in vertical line if possible and a sufficient distance downstream from any valve such that the resulting disturbance does not appear in the glass.

- F. Provide a filter-drier with isolating shut-off valves and with valved bypass only if compressor is not equipped with a suction line filter or screen.
- G. Keep piping free from traps unless otherwise indicated. Install vertical pipe plumb. Pitch horizontal piping only where slope is desirable.
- H. Provide shut-off valves at inlet and outlet to all condensers, receivers and evaporators to permit isolation for service. If possible, use angle valves to minimize pressure drop. Use angle valves in all cases at receivers. Use globe valves only when angle valves are impractical.
- I. Provide solenoid valves upright in horizontal lines only, unless their design allows installation in vertical pipe.
- J. Where compressor(s) do not have pump down control and the compressor(s) associated evaporator coil(s) do not have bottom suction header connections and the evaporator coil(s) are located above the compressor(s), then loop suction lines(s) to top level of coil to prevent liquid slugging.
- K. To prevent erratic operation of thermal expansion valve, provide a suction line trap next to evaporator coil suction outlet with expansion valve bulb located between coil and trap. Provide only in suction lines which are level leaving coil outlet or which rise on leaving coil outlet. Trap not required when evaporator coil outlet suction line drops to compressor or suction header immediately after expansion valve bulb.

END OF SECTION 15062

SECTION 15151 - HANGERS AND SUPPORTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SCOPE

- A. Provide all angles, brackets, clamps, anchors, inserts, rods, braces, frames, hangers nuts and bolts, and other miscellaneous steel and hardware items as may be required for the proper support of equipment, piping systems, HVAC systems, plumbing systems and fire protection systems.

1.3 RELATION TO OTHER WORK

- A. Refer to the section, "General Mechanical Provisions", for related requirements. Refer to other sections of Division-15 and to all other applicable portions of the Drawings and Specifications.
- B. This section directly relates in particular to sections (which may or may not be included in this division) which describe the following:
 - 1. Piping systems.
 - 2. Duct systems.
 - 3. Equipment items.

1.4 SHOP DRAWINGS

- A. Refer to Section entitled "General Mechanical Provisions". Provide specific data on hangers, stands, clamps, rollers, guides, shields, anchors and their proposed application. Submit detailed shop drawings, showing method of support and anchoring for all piping and equipment as follows:
 - 1. Piping Systems:
 - 2. Scaled single line piping plans superimposed on structural construction drawings. Scale shall be minimum $1/4" = 1'-0"$. Piping which is three inch (3") diameter and smaller may be omitted from these shop drawings. Drawings shall clearly indicate the location and type of each and every insert, hanger, stand, support, guide, isolator and anchor; and shall also indicate the size, type locations and method of attachment for all miscellaneous structural steel required.
 - 3. Sectional drawings, sketches and other details as may be required to clearly communicate the method of support, anchoring, guiding and vibration isolation.

4. Show details of any typical floor or wall penetrations including: riser clamp, pipe sleeve, and provisions for water stop to prevent the water travel between penetrations.

1.5 INDUSTRY STANDARDS

- A. Where compliance with an industry, society or association standard is specified or indicated, certification of such compliance shall be submitted with shop drawings.

1.6 MANUFACTURER

- A. Products listed in this Section or on the plans are based on a specific manufacturer to establish the desired style, quality and type. Equivalent products, complying with the requirements of this Section and the installation requirements of the plans, by the following manufacturers are acceptable:
 1. F&S Manufacturing Corp.
 2. Fee and Mason Manufacturing Co.

PART 2 - PRODUCTS

2.1 HANGERS

- A. Hangers In Contact With Copper Piping: Shall be copper plated or teflon coated. Hangers shall be Fed. Spec. WW-H-171E, Type 9. Acceptable: Grinnell Fig. 97 or 97C, or equivalent.
- B. Hangers (other than in Contact With Copper Piping): Shall have manufacturer's standard finish. Hangers shall be of the following types:
 1. Pipe 3" and Larger: Fed. Spec. WW-H-171E, Type 1. Acceptable: Grinnell Fig. 260 or equivalent.
 2. Pipe 2-1/2" and Smaller: Fed. Spec. WW-172E, Type 6. Acceptable: Grinnell Fig. 104 or equivalent.

2.2 ISOLATORS:

- A. Refer to the Section, if included in this Division, which describes vibration isolation.

2.3 PIPE ROLLER STANDS

- A. Shall be Fed. Spec. WW-H-171D, Type 47. Acceptable: Grinnell Fig. 171, or equivalent.

2.4 PIPE ROLLER HANGERS

- A. Pipe Roller Hangers: Shall be Fed. Spec. WW-H-171E, Type 42. Acceptable: Grinnell Fig. 171, or equivalent.

HANGERS AND SUPPORTS

2.5 PIPE ALIGNMENT GUIDES

- A. Acceptable: Grinnell Fig. 256, or equivalent.

2.6 PIPE RISER CLAMPS

- A. Pipe Riser Clamps: Shall be Fed. Spec. WW-H-171D, Type 8.

2.7 INSULATION SHIELDS

- A. Shall be Fed. Spec. WW-H-171D, Type 41. Acceptable: Grinnell Fig. 167, or equivalent.

2.8 BEAM CLAMPS

- A. Fed. Spec. WW-H-171D, Type 29. Acceptable: Grinnell Fig. 292 with links, or equivalent.

2.9 INSERTS

- A. Preset Type: Malleable iron with removable interchangeable nuts having lateral adjustment of not less than one and five-eighths inches. Continuous inserts shall have a capacity of 2,000 lb. per foot and shall be hooked over reinforcing. Acceptable: C-B Universal Fig. 282; Unistrut Products Co., P3200 or P3300; B-Line Systems, Inc., Series B- 32.1, or equivalent.

2.10 ROD

- A. Carbon steel, black threaded bolt ends or continuous thread, sized with safety factor of five (5). Acceptable: Grinnell Fig. 140 or 146, or equivalent.

PART 3 - EXECUTION

3.1 GENERAL

- A. Refer to Section entitled "General Mechanical Provisions". All inserts, fasteners, hangers and supports shall be installed in strict accordance with manufacturer's instructions.

3.2 PIPE

- A. General: Hangers shall be spaced to prevent sag and to permit proper drainage. All piping shall be run parallel with the lines of building, unless otherwise indicated on drawings. The hanger spacing and placement shall be such that after the covering (insulation and finish) is applied, there will be not less than 1/2" clear space between finished covering and other surfaces, including the finished covering of parallel adjacent pipes. Hangers for insulated pipes shall be sized to encompass the insulation, finish and metal insulation shield (a metal insulation shield shall be provided for each hanger or support). Vertical piping shall be supported with pipe riser clamps at every floor penetration, unless specifically indicated otherwise on the drawings. Hangers and supports shall not be placed at greater than the following intervals:

- B. Pipe 1" and Smaller: Eight foot (8') centers and not more than two feet (2') from a change in direction (offsets, elbows, and tees).

- 1. Pipe 1-1/4" through 2-1/2": Ten foot (10') centers and not more than two feet (2') from a change in direction (offsets, elbows and tees).
- 2. Pipe 3" and Larger: Fourteen foot (14') centers and not more than two feet (2') from a change in direction (offsets, elbows, and tees).

3.3 EQUIPMENT

- A. Equipment supports shall be as otherwise indicated on the drawings or in the specifications.

3.4 DUCTWORK

- A. Refer to Sections describing ductwork.

3.5 POWDER (GUNPOWDER) ACTUATED FASTENERS

- A. Not allowed.

3.6 STEEL DECKING

- A. On projects where floor or roof slabs are installed over steel decking, drill or punch web of steel decking and insert hangers with washers before the concrete fill is poured in place. Hangers shall be plumb within one-half inch (1/2") in four feet (4') and spaced as required for service intended.

END OF SECTION 15151

SECTION 15201 - VIBRATION ISOLATION EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SCOPE

- A. Provide vibration isolation supports for all equipment and piping as may be required to prevent transmission of vibration to building structure. This shall include air handling units, fans, piping, and similar items.

1.3 RELATION TO OTHER WORK

- A. Refer to the section, "General Mechanical Provisions", for related requirements. Refer to other sections of Division-15 and to all other applicable portions of the drawings and specifications.

1.4 SHOP DRAWINGS

- A. Refer to Section entitled "General Mechanical Provisions". Submittal data shall show type, point loading information, size and deflection of each isolator proposed and any other information as may be required for the Architect/Engineer to check isolator selections for compliance with specifications. Include clearly outlined procedures for installing and adjusting the isolators.

1.5 MANUFACTURERS

- A. Products of the following manufacturers will be acceptable, provided they comply with all of the requirements of this specification: Consolidated Kinetics; Mason Industries; Amber-Booth; Keflex; Flexonics; Vibration Eliminator Company or equivalent. Any model numbers listed are from one or more of these manufacturers and are given to provide an example of item(s) required.

1.6 OTHER REQUIREMENTS

- A. All vibration isolation equipment shall be both recommended by the manufacturer and approved by the Architect/Engineer for each particular application on this project.

PART 2 - PRODUCTS

2.1 BASIC REQUIREMENTS

- A. Unless otherwise noted, spring type vibration isolators shall be used for all motor driven equipment. It shall be the responsibility of isolation manufacturer to determine the amount of

spring deflection required for each isolator to achieve optimum performance, prevent the transmission of objectionable vibration and meet noise criteria referenced herein.

2.2 CORROSION PROTECTION

- A. Steel components shall be phosphated and painted. All nuts, bolts and washers shall be zinc-electroplated. Structural steel bases shall be thoroughly cleaned of welded slag and primed with zinc-chromate or metal etching primer.
- B. All isolators exposed to weather shall have steel parts PVC coated or hot-dip galvanized. Aluminum components shall be etched and painted. Nuts, bolts and washers may be zinc-electroplated.

2.3 BASIC ISOLATORS

- A. General: Unit designations indicated are Architect/Engineer designations. Each of the following basic isolators may not be applicable to a specific installation application. See PART 3, "EXECUTION".
- B. Spring Mounts, Open Type, Unrestrained (Unit SMOU): Free standing springs; laterally stable; minimum horizontal-to-vertical spring rate (K_x/K_y) of 1.0: 1/2-inch neoprene acoustical friction pads between bottom baseplate and the supporting surface; leveling bolts; provision for bolting the mount to the equipment (unless otherwise specified); spring diameters not less than 0.8 of the compressed height of the spring at rated load; springs shall have a minimum additional travel to full compression of 50% of the rated deflection; 1-inch minimum static deflection (unless otherwise specified); submittals shall include spring diameters, deflections, free spring heights, solid spring heights and operating heights. Be similar to Mason Type SLF; Korfund Series L; Amber-Booth Type SW.
- C. Neoprene and Spring Hangers, Vertical Deflection (Unit NSHV): Steel housing for undampened support of the spring; Provisions for attachment of hanger rods; reinforced neoprene washer and grommet to break up metal to metal contact; free standing spring; 1 inch minimum static deflection (unless otherwise specified) spring diameters not less than 0.8 of the compressed height of the spring at rated load; springs shall have a minimum additional travel to full compression of 50% of the rated deflection. Submittals shall include spring diameters, solid spring heights, free spring heights, deflections, overall hanger dimensions and maximum hanger rod diameter which can be accommodated by the hanger. Be similar to Mason Type DNHS: Amber-Booth Type BSR.
- D. Neoprene-In-Shear Hangers (Unit NH): Steel housing for undampened support of the neoprene; provisions for attachment of hanger rods; neoprene-in-shear isolator; similar to Mason Type HD, Amber-Booth Type HRD.

PART 3 - EXECUTION

3.1 GENERAL

- A. All isolators shall be installed in strict accordance with the manufacturer's instructions and shall be properly adjusted prior to requesting final inspection or the performance of any vibration testing specified.
- B. Each item of equipment (machinery, piping, etc.) which is provided with vibration isolation equipment shall rest in its intended, proper operating position (i.e; exactly level, etc.) after installation of vibration isolation equipment. Approval of such vibration isolation equipment by Architect/Engineer shall not relieve the Contractor of this responsibility.

3.2 AIR HANDLING UNITS, FANS

A. Roof Mounted Fan, EF-10:

- 1. Spring mounted (Unit SMOU) with 1 inch minimum static deflection.
- 2. Flexible duct connections as specified in "Duct System Accessories" section.

B. Air Handling Units Suspended from Building Structure:

- 1. Spring hangers (Unit NSHV) with 1-inch minimum static deflection when motor is 5-HP or less; spring hangers (Unit NSHV) with 2-inch minimum static deflection when motor is 7-1/2 HP or greater.
- 2. Flexible duct connectors as specified in Section entitled "Ductwork".

3.3 CEILING EXHAUST FANS

- A. Flexible duct connectors as specified in "Ductwork".
- B. Neoprene-in-shear hangers (Unit NH).

END OF SECTION 15201



SECTION 15400 - PLUMBING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Special Conditions and Division-1 Specification sections, apply to work of this section.

1.2 SCOPE

- A. The work pertaining to this Division occurs within the confines of the building line, and within a boundary outside of the building line for a distance of five (5) feet, measured normal to the building line, or as indicated on the drawings.
- B. Alternates may or may not substantially change scope and general character of the work; and must not be confused with "change orders", "substitutions", and other similar provisions.

1.3 RELATION TO OTHER WORK

- A. Refer to the section, "General Mechanical Provisions", for related requirements. Refer to other sections of Division 15 and to all other applicable portions of the Drawings and Specifications.

1.4 SUBMITTALS

- A. Submit manufacturer's data for review before any work is commenced.

PART 2 - PRODUCTS

2.1 PIPING SPECIALTIES

- A. Where it is desirable or necessary to support the pipe hangers to concrete, inserts shall be placed in the forms by the Mechanical Contractor prior to the time concrete is poured.
- B. Lead tamp-ins may be used when installed in a concrete or masonry wall or other like vertical surface to support a vertical hanger. Lead tamp-ins will not be permitted to support hangers to the underside of concrete slab.
- C. For parallel runs of above ground suspended piping, an acceptable trapeze-type hanger may be used. Provide permanent, non-conductive type wrapping between copper pipe and steel trapeze hangers.

- D. Pipes passing through walls, floors shall have sleeves of the same materials as the pipe. Sleeves shall allow insulated pipes to pass without changing the insulation thickness. Clearance around sleeves shall be packed with glass fiber after completion of pipe work. Sleeves in all floor slabs except slabs on grade shall have pipe sleeves extended 1 inch above finish floor to prevent water from running through sleeves to area below. Make watertight, caulk with sealant around each sleeve.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. The contractor shall furnish all labor, materials, equipment and instruments required to conduct tests of piping systems. Tests shall be as herein called for.
- B. Tests shall be conducted and the inspection of the piping shall be made in the presence of the Architect and/or Engineers.
- C. Material and/or joints found defective shall be replaced and/or corrected and additional tests shall be conducted after correction of work.

3.2 PIPE SIZING, DRAWINGS AND SPECIFICATIONS

- A. It is intended that work covered by these specifications and drawings include everything requisite and necessary to make the various systems complete and operative, irrespective of whether or not every item is specifically provided for. Any omission of direct reference herein to any essential item shall not excuse contractor from complying with the above intent.
- B. Figured dimensions supercede scaled ones. Contractor shall take no advantage of, and shall promptly call the Owner's Representative's attention to any error, omission or inconsistency in specifications and drawings.
- C. Special attention is directed to requirements that equipment and materials stated in specifications and/or indicated on drawings shall be furnished, except if otherwise noted, completely installed, adjusted and left in safe and satisfactory operating condition. Accessories, appliances and connections necessary for operation of equipment shall be provided to satisfaction of the Owner's Representative.
- D. Materials, apparatus or equipment specified or otherwise provided for on drawings, addenda, or change orders issued subsequent to award of contract shall be same brand, type, quality and character originally specified unless otherwise provided.
- E. Layout of equipment, accessories, specialties and suspended, concealed or exposed piping systems are diagrammatic unless dimensioned. In preparing shop drawings, contractor shall check project conditions before installing work. If there are any interferences or conflicts, they shall be called to attention of the Owner's Representative immediately for clarification.

- F. The drawings indicate required size and points of termination of pipes and ducts and suggest proper routes to conform to structure, avoid obstructions and preserve clearances. However, it is not intended that drawings indicate all necessary offsets, and it shall be the work of this contractor to make the installation in such a manner as to conform to structure, avoid obstructions, preserve headroom and keep openings and passageways clear, without further obstruction or cost to the Owner.
- G. Shop drawings shall be furnished by this contractor, indicating all changes to meet space requirements, code requirements and as necessary to resolve all space conflicts.
- H. It is intended that all apparatus be located symmetrical with architectural elements, and shall be installed at exact height and locations as shown on the architectural drawings. Refer to architectural details in completing and correlating work.
- I. The contractor shall fully inform himself regarding any and all peculiarities and limitations of the spaces available for the installation of all work and materials furnished and installed under the contract, prior to submitting his bid. He shall exercise due and particular caution to determine that all parts of his work are made quickly and easily accessible.
- J. The contractor shall carefully examine any existing conditions, existing piping and ducts and premises and compare the drawing with the existing conditions, prior to submitting his bid.
- K. It cannot be too strongly emphasized that, except for work specifically excluded herein, every system shall be turned over to Owner installed completed, with components, ready for normal operation.
- L. In addition to work shown on mechanical drawings, see Architectural Drawings for existing work to be removed, relocated and/or modified. Modify existing systems by rerouting for systems to remain or remove the abandoned systems as required to accommodate new general construction, plumbing, electrical and mechanical work.
- M. Pipe sizes shall be minimum as allowed by local codes or as shown on the drawings, whichever is larger.

END OF SECTION 15400



SECTION 15401 - SANITARY SEWER, STORM WATER & SANITARY VENT PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Special Conditions and Division-1 Specification sections, apply to work of this section.

1.2 SCOPE

- A. The work pertaining to this Division occurs within the confines of the building line, and within a boundary outside of the building line for a distance of five (5) feet, measured normal to the building line, or as indicated on the drawings.
- B. Alternates may or may not substantially change scope and general character of the work; and must not be confused with "change orders", "substitutions", and other similar provisions.

1.3 RELATION TO OTHER WORK

- A. Refer to the section, "General Mechanical Provisions", for related requirements. Refer to other sections of Division 15 and to all other applicable portions of the Drawings and Specifications.

1.4 SUBMITTALS

- A. Submit manufacturer's data for review before any work is commenced.

PART 2 - PRODUCTS

2.1 MATERIAL

- A. The following schedule covers materials unless otherwise specified under a particular System Section.

2.2 PIPE

- A. Cast-iron soil pipe service weight, centrifugally cast, ANSI A112.5.1. 2" Through 15" size, bell and spigot joint.
- B. Cast-iron soil pipe service weight, centrifugally cast, ANSI A112.5.1. 1-1/2" through 10" size, "non-hub" joint.
- C. Reinforced concrete pipe (RCP) 12" through 144" bell and spigot pattern with O-ring rubber gaskets, ASTM C76.

- D. Copper type DWV.
- E. Brass pipe or tube, chrome plated.
- F. PVC Type DWV, ASTM D2665-78.

2.3 FITTINGS

- A. Cast-Iron Soil Pipe:
 - 1. Underground: Provide fittings of same weight and manufacture as pipe in which installed. Joints shall be bell and spigot push-on type neoprene gasket or "NO HUB" type conforming to CIPI Standard 301 unless noted otherwise on drawings.
 - 2. Above ground and in buildings: "NO-HUB" type conforming to CIPI Standard 301 unless noted otherwise on the drawings.
- B. Threaded Drainage Pipe: Cast-iron, recessed.
- C. Copper DWV: Cast or wrought solder joint DWV drainage fittings.
- D. PVC Type DWV: ASTM D-2665, NSF Seal of Approval, Solvent-cement joint.

2.4 PIPE JOINTS

- A. Bell and spigot type joint shall be made with push-on compression type, neoprene gasket conforming to ASTM A-74.
- B. No-hub type joints shall be constructed of 24 gage type 304 stainless steel, with gasket guides, type 304 stainless steel screw clamp, and matching neoprene (ASTM C-564) gasket that shall interlock with housing.
- C. Joints in copper piping shall be made with tin-antimony solder (95-5) silver solder and non-acid flux.
- D. Joints in threaded piping shall be made with teflon tape or non hardening pipe compound (Seal-tite).

2.5 VENT FLASHING

- A. Refer to roofing section for vent flashing and boot specifications.

2.6 IDENTIFICATION

- A. Below grade piping identification and warning tape shall be 0.004 inch thick polyethylene, printed with a continuous two line message. Tapes used for non magnetic piping materials shall have a metallic core. Acceptable manufacturer is Seton Name Plate Corporation or approved equal.

PART 3 - EXECUTION

3.1 GENERAL

- A. The design drawings are generally diagrammatic. They do not show every bend, off-set, elbow or other fitting which may be required in the piping for installation in the space allotted. Careful coordination of the work is necessary to avoid conflicts.
- B. PVC piping, fittings and other PVC materials shall not be installed in air conditioning plenums or equipment rooms used as air conditioning plenums.
- C. Joints and connections shall be made permanent and watertight.
- D. Run piping to sewer connection point outside of building or as indicated on drawings.
- E. Install 3" and larger horizontal soil and waste piping to 1/8" per foot slope. Piping 2" and smaller shall be installed at a slope of 1/4" per foot. Run horizontal vent lines to a minimum grade back to stacks and vertical vent lines as direct and free from bends as possible.
- F. For piping requiring insulation, lay out and carefully install piping with sufficient clearances to permit proper application of the insulation. If the piping is such that a neat insulation job cannot be obtained with reasonable effort, the piping subcontractor shall relocate piping.
- G. Separate underground water piping and building sewer with undisturbed or compacted earth at least 10' horizontally if installed at the same level or lower than the sewer. Where water piping is closer than 10' to a sewer, place the bottom of the water pipe at least 18" above the top of the sewer, or the sewer shall be encased in a concrete envelope as required by the Department of Health & Rehabilitative Services (State of Florida).
- H. Minimum cover for exterior underground piping is three feet over conduit unless otherwise noted on plans. Carefully excavate trench to smooth finished surface; if cut is too deep, backfill with clean earth and hand tamp to compact bottom. Make depression at joints to receive bells, collars, and couplings. Provide continuous support for pipe or conduit. Backfill to be clean earth, free of rocks and debris completely enveloping pipe or conduit on both sides and top to a minimum thickness of 6". Carefully hand tamp backfill in 6" layers until 18" has been deposited over pipe or conduit.
- I. Place color coded 6" wide 0.004" thickness polyethylene printed plastic identification tape directly above all underground piping systems approximately 12" below finished grade. Tapes shall be continuously printed with "CAUTION" in large bold letters. Printed second line with type of service below. Red tape is to be used for sewer, (Print type of water on tape; i.e., storm water.)

3.2 HANGERS AND SUPPORTS

- A. Vertical Piping shall be supported at its base and no greater than every story height, not to exceed 20 foot intervals.

- B. Horizontal Piping (Suspended) shall be supported at each bend; at not more than five (5) foot intervals; except that pipe exceeding five (5) feet in length may be supported at not more than ten (10) foot intervals. Supports shall be adequate to maintain alignment and prevent sagging and shall be made directly behind the bell or coupling, where possible, not near the center of the pipe.
- C. Supports shall be connected to the building structure not from other equipment, ducts or conduits.
- D. Horizontal pipe and fittings six inches and larger shall be suitably braced to prevent horizontal movement. This should be done at every branch opening or change of direction by the use of braces, blocks, rodding or other suitable method, to prevent movement.
- E. Where components are suspended in excess of eighteen inches by means of non-rigid hangers, they should be suitably braced against movement horizontally, often called sway bracing.

3.3 LINE AND GRADE

- A. Install gravity lines at uniform grade to low point after field verification of low point invert.
- B. Run piping straight, plumb and grade in the direction indicated on the drawings.

3.4 JOINTING PIPE

- A. All pipe lines shall be correctly aligned before joints are made.
- B. Squarely cut pipe and properly ream to remove all constriction and burrs before making up the joints.
- C. Threaded Pipe: Ream all pipe after cutting and before threading. Use non-hardening pipe compound on male threads only at each joint and tighten joint to leave not more than 3 threads exposed.
- D. Copper Tube: Ream all pipe after cutting squarely, clean outside of tube ends and inside of fittings and tin end to be soldered. Apply non-acid solder flux to joint areas of both tubes and fittings. Insert tube full depth into fitting, and solder in manner which will draw solder full depth and circumference of joint. Wipe excess solder from joint before it hardens.
- E. Joining "NO-HUB" cast iron soil pipe and fittings shall be in accordance with recommended practices described by the coupling manufacturers.
- F. Provide nipples of same material and weight as pipe used. Provide extra strong nipples when length of unthreaded part of standard weight nipple is less than 1-1/2".
- G. Provide reducing fittings (reducing bushings shall not be used) where changes in pipe sizes occur.
- H. Provide dielectric unions or flanges between copper and steel piping and between brassware and steel. Do not use steel and copper piping in the same system without such isolation.

3.5 PIPE PROTECTION

- A. Paint all uninsulated piping underground (except cast iron) with two coats of asphaltic paint. (Manual wiping is not acceptable).
- B. Wrap soil pipe that touches metal or is exposed to masonry with a layer of 6 mil polyene film or 15 lb. roofing felt.
- C. Spirally wrap all pipe lines embedded in concrete with two layers of 30 lb. roofing felt.

3.6 TESTS

- A. A water test shall be applied to the sanitary and storm drainage systems either in its entirety or in sections. If applied to the entire system, all openings in the piping shall be tightly closed, except the highest opening and the system filled with water to point of overflow. If the system is tested in sections, each opening shall be tightly plugged except the highest openings of the section under test, and each section shall be filled with water, but no section shall be tested with less than 10 ft. head of water. In testing successive sections at least the upper 10 ft of the next preceding section shall be tested, so that no joint or pipe in the building (except the uppermost 10 ft of the system) shall have been submitted to a test of less than a 10 ft head of water. The water shall be kept in the system, or in the portion under test, for at least 30 minutes before inspection starts; the system shall then be tight at all points.
- B. An air test shall be made by attaching an air compressor or testing apparatus to any suitable opening and after closing all other inlets and outlets to the system, forcing air into the system until there is a uniform gauge pressure of 5 psi or sufficient to balance a column of mercury ten inches in height. This pressure shall be held without introduction of additional air for a period of at least 30 minutes.
- C. Complete all field testing prior to insulation, wrapping and/or backfill.

3.7 VENT FLASHING

- A. Refer to roofing section for vent flashing and boot.

END OF SECTION 15401



SECTION 15402 - DOMESTIC COLD & HOT WATER SUPPLY PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Special Conditions and Division-1 Specification sections, apply to work of this section.

1.2 SCOPE

- A. The work pertaining to this Division occurs within the confines of the building line, and within a boundary outside of the building line for a distance of five (5) feet, measured normal to the building line, or as indicated on the drawings.
- B. Alternates may or may not substantially change scope and general character of the work; and must not be confused with "change orders", "substitutions", and other similar provisions.

1.3 RELATION TO OTHER WORK

- A. Refer to the section, "General Mechanical Provisions", for related requirements. Refer to other sections of Division 15 and to all other applicable portions of the Drawings and Specifications.

1.4 SUBMITTALS

- A. Submit manufacturer's data for review before any work is commenced.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Provide valves and specialties as specified under additional Sections of this Specification.

2.2 PIPE

- A. The following schedule covers materials unless otherwise specified under a particular System Section.
 - 1. Galvanized steel pipe, Schedule 40, ANSI B 125.2.
 - 2. Copper tube, Type L, hard drawn, ASTM B 88.
 - 3. Brass pipe or tube, chrome plated.

2.3 FITTINGS

- A. Steel Pipe: Malleable iron 150 lb. banded, galvanized to match pipe.

- B. Copper Tube: Wrought or cast brass solder joint.
- C. The 'T' drill extruded fitting method may be used in conjunction with silver solder with written approval of the Architect/Engineer.
- D. Service material shall be brass compression fittings-angle ball cocks, ball corporations, etc. Flared fittings are acceptable under controlled conditions.

2.4 PIPE JOINTS

- A. Joints in copper piping shall be made with tin-antimony solder (95-5) and non-acid flux. Contractor shall furnish manufacturers literature documenting that the lead content (trace quantities) are within the guidelines of the local codes having jurisdiction as well as the Safe Drinking Water Act Amendment (SDWAA).
- B. Joints in threaded piping shall be made with teflon tape or non hardening pipe compound (seal-tite).

PART 3 - EXECUTION

3.1 GENERAL

- A. The design drawings are generally diagrammatic. They do not show every bend, off-set, elbow or other fitting which may be required in the piping for installation in the space allotted. Careful coordination of the work is necessary to avoid conflicts.
- B. Run all water lines parallel or perpendicular to building lines.
- C. For piping requiring insulation, lay out and carefully install piping with sufficient clearances to permit proper application of the insulation. If the piping is such that a neat insulation job cannot be obtained with reasonable effort, the piping subcontractor shall relocate piping.
- D. Separate underground water piping and building sewer with undisturbed or compacted earth at least 10' horizontally if installed at the same level or lower than the sewer. Where water piping is closer than 10' to a sewer, place the bottom of the water pipe at least 18" above the top of the sewer, or the sewer shall be encased in a concrete envelope as required by the Department of Health & Rehabilitative Services (State of Florida).
- E. Minimum cover for exterior underground piping is three feet over insulation or conduit unless otherwise noted on plans. Carefully excavate trench to smooth finished surface; if cut is too deep, backfill with clean earth and hand tamp to compact bottom. Make depression at joints to receive flanges, collars, and couplings. Provide continuous support for pipe or conduit. Backfill to be clean earth, free of rocks and debris completely enveloping pipe or conduit on both sides and top to a minimum thickness of 6". Carefully hand tamp backfill in 6" layers until 24" has been deposited over pipe or conduit.

- F. Place color coded 6" wide 0.004" thickness polyethylene printed plastic identification tape directly above all underground piping systems approximately 12" below finished grade. Tapes shall be continuously printed with "CAUTION" in large bold letters. Printed second line with type of service below. Yellow tape is to be used for water, (Print type of water on tape; i.e., domestic cold water.)

3.2 HANGERS AND SUPPORTS

- A. Vertical Piping shall be supported at its base and no greater than every story height.
- B. Horizontal Piping (Suspended) shall be supported at not more than eight (8) foot intervals. Supports shall be adequate to maintain alignment and prevent sagging.
- C. Supports shall be connected to the building structure not from other equipment, ducts or conduits.

3.3 JOINTING PIPE

- A. All pipe lines shall be correctly aligned before joints are made.
- B. Squarely cut pipe and properly ream to remove all constriction and burrs before making up the joints.
- C. Threaded Pipe: Ream all pipe after cutting and before threading. Use non-hardening pipe compound or tape on male threads only at each joint and tighten joint to leave not more than 3 threads exposed.
- D. Copper Tube: Ream all pipe after cutting squarely, clean outside of tube ends and inside of fittings and tin end to be soldered. Apply solder flux to joint areas of both tubes and fittings. Insert tube full depth into fitting, and solder in manner which will draw solder full depth and circumference of joint. Wipe excess solder from joint before it hardens.
- E. Provide nipples of same material and weight as pipe used. Provide extra strong nipples when length of unthreaded part of standard weight nipple is less than 1-1/2".
- F. Run water supply main to point indicated on plans.

3.4 WATER HAMMER ARRESTERS

- A. Water hammer arresters (shock stops) shall be installed at the locations on the plans and in accordance with PDI Standard WH-201. Provide access panels so located to permit ease of service.

3.5 VALVES

- A. Provide valves to isolate each riser, and branch line. See also Section 15460 for requirements.

3.6 REDUCERS

- A. Screwed bushings are prohibited, except where available space prevents use of reducing couplings. Pipe reductions on horizontal, hot water piping shall be made with eccentric reducers. Top of hot water piping shall be flat for venting.

3.7 TESTS

- A. Apply a water pressure test to all parts of the water supply system before the piping is concealed and before the fixtures and equipment are connected. Use a hydrostatic pressure of not less than 100 psig or 150% of system operating pressure, applied to the system for a period of four hours. There shall be no leaks at any point in the system at this pressure.
- B. Leave concealed work uncovered until required tests have been completed, but if necessary, make tests on portions of the work and those portions of the work may be concealed after being inspected and approved. Make repairs of defects that are discovered as a result of inspection or tests with new materials. Caulking, welding or other such sealing methods of screwed joints, cracks or holes will not be accepted. Repeat tests after defects have been eliminated.
- C. Complete all field testing prior to insulation, wrapping and/or backfill.

3.8 STERILIZATION

- A. As soon as the water piping has been thoroughly flushed out, sterilize the lines by introducing into them a solution of calcium hypochlorite or chloride of lime. Open and close all valves while system is being chlorinated. After the sterilizing agent has been applied for 24 hours, test for residual chlorine at the ends of the lines. If less than 10 parts per million is indicated, repeat the process. When tests show at least 10 parts per million of residual chlorine, flush out the system until all traces of the chemical used are removed. Make necessary connections to sterilized piping.

3.9 PIPE PROTECTIONS

- A. Paint all uninsulated piping underground with two coats of asphaltic paint. (Manual wiping is not acceptable)
- B. Wrap pipe that touches metal or is exposed to masonry with a layer of 6 mil polyethylene film or 15 lb. felt.
- C. Spirally wrap all pipe lines embedded in concrete with two layers of 30 lb. felt.
- D. Coat all exposed threads on galvanized steel pipe after assembly with two coats of zinc chromate. Remove pipe thread lubricants prior to applying paint.

END OF SECTION 15402

SECTION 15421 - FLOOR DRAINS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Special Conditions and Division-1 Specification sections, apply to work of this section.

1.2 SCOPE

- A. Furnish and install floor drains including strainers and trap primers.
- B. Alternates may or may not substantially change scope and general character of the work; and must not be confused with "change orders", "substitutions", and other similar provisions.

1.3 RELATION TO OTHER WORK

- A. Refer to the section, "General Mechanical Provisions", for related requirements. Refer to other sections of Division 15 and to all other applicable portions of the Drawings and Specifications.

1.4 SUBMITTALS

- A. Submit manufacturer's data for review before any work is commenced.

PART 2 - PRODUCTS

2.1 DRAINS

- A. Drains shall be of the type and materials as scheduled on the drawings.
- B. Provide all necessary bolts, clamping rings and appurtenances to effect a complete installation.
- C. The strainer size shall be as recommended by the manufacturer unless otherwise indicated on the drawings. The strainers shall be nickel alloy or polished brass. Provide tapped boss and trap primer floor drains as indicated on the drawings.

2.2 TRAP PRIMERS

- A. Provide for all floor drains.
- B. Units shall be cast bronze, with removable top cover, threaded or sweat pattern, and integral vacuum breaker.
- C. Acceptable manufacturers are; Wade, Josam, Smith and Zurn.

PART 3 - EXECUTION

3.1 DRAINS

- A. Install all drains in accordance with the manufacturers instructions.

3.2 TRAP PRIMERS

- A. Trap primer outlet should extend vertically a minimum of 12" before a change in direction to horizontal is made. The horizontal line to the trap primer connection shall be installed sloping to the trap it serves. Provide a minimum size of 12" x 12" stainless steel access cover for each trap primer.

END OF SECTION 15421

SECTION 15423 - CLEANOUTS AND CLEANOUT ACCESS COVERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Special Conditions and Division-1 Specification sections, apply to work of this section.
- B. Alternates may be or may not substantially change scope and general character of the work; and must not be confused with "change orders", "substitutions", and other similar provisions.

1.2 SCOPE

- A. Furnish and install cleanouts as shown on drawing or specified herein.

1.3 RELATION TO OTHER WORK

- A. Refer to the section, "General Mechanical Provisions", for related requirements. Refer to other sections of Division 15 and to all other applicable portions of the Drawings and Specifications.

1.4 SUBMITTALS

- A. Submit manufacturer's data for review before any work is commenced.

PART 2 - PRODUCT

2.1 MATERIALS

- A. Cleanouts and cleanout access covers shall be equal to Jonespec Model 61000 for carpeted areas and 61040 in other floor areas. Wall cleanouts shall be equal to Jonespec 63150 with stainless steel access cover in finished areas.
- B. Provide all necessary bolts, and appurtenances to effect a complete installation.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install all cleanouts and cleanout access covers in accordance with the manufacturers instructions.
- B. Exterior cleanouts below grade shall be extended to finish grade. Pour a concrete pad 18" x 18" x 6" thick around cleanout; slope top down approximately 2" from cleanout to edge of pad so that edge of pad is flush with grade.

- C. Cleanouts shall be of the same nominal size as the pipes to which they are connected up to 4" in diameter; and not less than 4" for larger pipes.
- D. Cleanouts shall be provided at not more than 50 feet apart in horizontal drainage lines of 4" nominal diameter, and at not more than 75 feet apart for larger diameter pipe.
- E. At change in direction: Cleanouts shall be provided at each change of direction of the building drain when the angle of change is 90 degrees.
- F. At base of stacks: Cleanouts shall be provided at or near the base of each vertical stack.
- G. Direction of cleanout: All cleanouts shall be installed so that the cleanout opens in a direction opposite to the flow of the drainage line, or at a right angle to the line.
- H. Concealed cleanouts in wall shall be provided with removable access panel.
- I. Where access cleanout boxes or covers are installed in the floor, the top surface shall be scoriated and the cover secured, but removable when necessary. Polished brass. Install carpet type covers in carpeted areas.

END OF SECTION 15423

SECTION 15450 - PLUMBING FIXTURES AND TRIM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Special Conditions and Division-1 Specification sections, apply to work of this section.

1.2 SCOPE

- A. Furnish and install plumbing fixtures indicated on drawings or specified herein.
- B. All plumbing fixtures shall be "First Quality" as defined and set forth in Commercial Standard CS77-28 as promulgated by the U.S. Department of Commerce. All fixtures are to be white vitreous china unless otherwise specifically noted. Where enameled iron fixtures are specified, they shall be furnished with acid resisting enamel.
- C. Fixtures shall be properly protected from damage during construction and shall be cleaned in accordance with manufacturer's instruction under this section of the specifications.
- D. Fixtures and fittings proposed shall be from one manufacturer and of similar character in any room or location. Escutcheons, handles, etc., on the different fixtures shall be of the same design.
- E. The fixture numbers and types are scheduled on the drawings, and are used to indicate type and quality of fixtures desired. Acceptable fixture manufacturers are as follows: American Standard, Eljer and Kohler. Fixture manufacturers not listed herein will be considered subject to the general requirement outlined in Section 15010 Mechanical General Provisions.
- F. Alternates may or may not substantially change scope and general character of the work; and must not be confused with "change orders", "substitutions", and other similar provisions.

1.3 RELATION TO OTHER WORK

- A. Refer to the section, "General Mechanical Provisions", for related requirements. Refer to other sections of Division 15 and to all other applicable portions of the Drawings and Specifications.

1.4 SUBMITTALS

- A. Submit manufacturer's data for review before any work is commenced.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Flush valves and water closet seats shall be as scheduled on the drawings.
- B. All exposed metal not otherwise specified shall be polished chromium on brass or bronze. All supply valves shall have renewable seats and discs. All hot and cold water supply to fixtures shall be provided with stops. Provide P-trap with cleanout for each lavatory and sink except as specifically noted.
- C. All seats shall be solid, white, open front seat with checking and self sustaining, stainless steel hinge.
- D. Chair carriers and combination chair carriers and fittings shall be as scheduled on the drawings.
- E. Chrome-plated. Provide where exposed piping passes through finished surfaces. Escutcheons for extended sleeves shall be of the type designed for that purpose.
- F. Provide a concealed hanger type lavatory chair carrier with short foot mounted in the chase to support lavatories shown on walls of a chase.
- G. Provide through toggle bolts, 1/8" thickness steel backing plate, and wall hangers for support of lavatories on 6" or thicker concrete block walls.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Layout fixtures as indicated on the drawings.
- B. Carefully install fixtures in accordance with manufacturer's data with sufficient clearances to coordinate with accessories, specialties and equipment specified in other divisions of these specifications and/or as shown on the drawings.
- C. Hangers and carriers shall be installed in accordance with manufacturer's recommendations and in accordance with good practice and workmanship.
- D. Clean all exposed metal surfaces from grease, dirt, paint or other foreign material.
- E. Fixtures shall be properly protected from damage during construction and shall be cleaned in accordance with manufacturer's instruction under this section of the specification.

- F. Fixtures, chrome-plated piping, fittings and trim shall be polished before requesting acceptance of the system.

END OF SECTION 15450



SECTION 15460 - VALVES, COCKS AND SPECIALTIES FOR PLUMBING SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Special Conditions and Division-1 Specification sections, apply to work of this section.

1.2 SCOPE

- A. Furnish and install valves, cocks and specialties as indicated on drawings or specified herein.
- B. Valves, cocks and specialties may not be indicated in every instance on the drawings, but whether or not shown, all valves, cocks and check valves necessary to the proper operation of the system shall be furnished and installed by subcontractor in an approved manner and location. Pressure ratings given for valves are steam working pressure. Valves shall have rising stems except in locations where space is limited; in these locations non-rising stem valves of equal material and pressure class will be accepted.
- C. Alternates may or may not substantially change scope and general character of the work; and must not be confused with "change orders", "substitutions", and other similar provisions.

1.3 RELATION TO OTHER WORK

- A. Refer to the section, "General Mechanical Provisions", for related requirements. Refer to other sections of Division 15 and to all other applicable portions of the Drawings and Specifications.

1.4 SUBMITTALS

- A. Submit manufacturer's data for review before any work is commenced.

PART 2 - PRODUCTS

2.1 WATER MAIN VALVES

- A. Water main valves are to be AWWA approved, gate valve, double disc, iron body, bronze trim, non-rising stem, flanged end, with 2" square wrench nut. Valve boxes are to be cast iron adjustable type for top flush with ground surface. Furnish a box for each underground valve shown on drawings.

Valves

Mueller No. A2380-6
Stockham Fig. G-745
Crane No. 462

Valve Boxes

Alabama Pipe Co. E2602
James B. Clow F2450
Mueller H10360

2.2 GATE VALVES (THREADED)

- A. 3" and smaller threaded valves and 4" and smaller solder pattern valves, rising stem, iron wheel, rough brass body, solid wedge disc, screwed or union bonnet and finished gland nut - 150 psi class.

<u>Threaded Pattern</u>	<u>Soldered Pattern</u>
Crane 431	---
Powell 514S	1842S
Walworth 56	---
Lunkenheimer 2151	3150
Stockham B-122	B-124

2.3 GATE VALVES (FLANGED)

- A. 3-1/2" and larger; except for solder valves as noted above shall be flanged type with cast iron body, brass trim, brass seats, rising stem and iron wheel - 125 psi class.

Flanged Pattern
Crane 465-1/2
Powell 1793
Walworth 726F
Lunkenheimer 1430
Stockham G-623
or approved equivalent

2.4 CHECK VALVES (SWING)

- A. Check valves 3" and smaller shall have a pressure rating of not less than 200 psi threaded pattern and 125 psi solder pattern, wye pattern swing check with rough brass body, finished gland nut and regrinding bronze disc.
- B. Check valves larger than 3" shall be flanged pattern, 125 psi iron body swing check with renewable brass seat, disc and trim. Check valves on primary heating hot water or chilled water piping system shall be 200 psi WP brass or ferrosteel body swing check valves, with renewable brass seat, disc and trim.

	<u>Flanged Pattern</u>	
	125 psi	200 psi
Crane	373	39E
Powell	559	576
Walworth	M-928F	M-970F
Lunkenheimer	1790	323
Stockham	G-931	---

2.5 COCKS

- A. Provide tight shut off balancing cocks at locations indicated on drawings.
- B. Cocks 2" and smaller, square head bronze cocks 125 psi class with check.

Crane 254
Powell 955
Walworth 554
Lunkenheimer 454,
or approved equal

- C. Cocks over 2", lubricated plug valves with semi-steel body 175 psi class.

<u>Screwed 2" and 3"</u>	<u>Flanged 4" and over</u>
Powell F 2200	Powell F 2201
Walworth 1700	Walworth 1700F
ACF R 1430	ACF R 1431
or approved equivalent	

- D. Lubricated plug cocks over 6" shall have a geared or worm drive operator.
- E. Lubricated plug cocks may be used in lieu of globe or gate valves on heating hot water or chilled water steel piping systems to facilitate installation of insulation. All 6" or smaller chilled water piping valves located above finished ceilings (unless located over drip pan), or below ceiling in a finished area of the building shall be lubricated plug cocks. Provide handle or operator for each valve.

2.6 BACK FLOW PREVENTER (REDUCED PRESSURE)

- A. 3/4" to 4" size; ASSE Std. 1013, AWWA Std. C-506; unit shall have all bronze construction, stainless steel internal parts, test cocks and suitable for 175 psi supply water pressure. Unit shall be furnished with factory mounted bronze inlet strainer, union and non-rising stem gate valves (on inlet and outlet). Watts Series 900 Beeco or approved equal.

2.7 DIELECTRIC UNIONS

- A. Epco Sales, Inc., 3204 Sackett Avenue, Cleveland, Ohio; Capitol Manufacturing & Supply Company, Columbus; Patrol Valve Company, Cleveland, Ohio, or approved equal.

2.8 ACCESS PANELS

- A. Access panels (Milcor) Inland-Ryerson Construction Products Co., (Boico) Birmingham Ornamental Iron Co., or approved equal. Steel panels and frames shall be furnished with prime coat of rust inhibitor enamel. See plans for sizes (12 x 12) min.). Access panel styles as follows:

Milco
Fire rated 1-1/2 hr. B. Label

Boico
1-1/2 hr. B. Label

2.9 SAFETY VALVES

- A. Safety Valves to be Manning, Maxwell & Moore, Watts Regulator, or Bell & Gossett Co., ASME rated as shown on the drawings and/or required by applicable codes.
- B. Protect water heaters with Watts, Beaton Cadwell or McDonnell Miller, combination automatic temperature and pressure relief valves (with manual lift lever). Relief capacity shall exceed input energy at 125 psig pressure and 210°F temperature.

2.10 WATER HAMMER ARRESTERS

- A. Water hammer arresters (shock stops) shall be equal to those manufactured by Josam Manufacturing Company, Zurn Industries, Inc., Wade, Inc., or Jay R. Smith Manufacturing Company.

PART 3 - EXECUTION

3.1 GENERAL

- A. Install valves and cocks in horizontal piping with the valve stem in the vertical upright position.
- B. Install valves and cocks to provide adequate clearance to permit easy operation of the valve hand wheel and permit servicing of the valve packing.

3.2 ACCESS PANELS

- A. Furnish adequate number of properly sized access panels (12" x 12" minimum size) to adequately service and maintain systems installed under each section of specifications.
- B. Access panels shall be installed and painted under other divisions of these specifications. Exact panel location shall be designated by the subcontractor performing the work of this Section.
- C. Access panels are not required in exposed grid or other types of readily removable ceilings.
- D. Access panels shall not compromise the fire rating of the wall.

3.3 SAFETY VALVES

- A. Safety valves to have valve spindle enclosure with gland seal to minimize leakage and manual lift lever to check discharge required. Cut discharge pipe from safety valve on a 45 degree angle, pipe to floor and direct toward or into floor drain (unless noted otherwise on the drawings).

3.4 WATER HAMMER ARRESTERS

- A. Install water hammer arresters (shock stops) at the locations indicated on the plans and in accordance with size and placement recommendations given in Plumbing and Drainage Institute Standard PDI-WH201.

3.5 BACKFLOW PREVENTERS

- A. Water service back flow preventers shall be installed above grade and in such a manner to prevent the discharge relief opening from becoming submerged by ground water. Provide suitable protection to prevent assembly from freezing.

END OF SECTION 15460



SECTION 15465 - INSULATION FOR PLUMBING SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SCOPE

- A. Above grade domestic hot water supply piping.
- B. Above grade domestic cold water piping in vented attic, vented ceiling spaces and vented soffits with 3/4" fiberglass and all service jacket.
- C. Above grade exterior domestic cold water piping.
- D. Handicap lavatory exposed hot water and waste piping.
- E. Above grade water piping exposed in unheated areas.
- F. Alternates may or may not substantially change scope and general character of the work; and must not be confused with "change orders", "substitutions", and other similar provisions.

1.3 RELATION TO OTHER WORK

- A. Refer to the section, "General Mechanical Provisions", for related requirements. Refer to other sections of Division-15 and to all other applicable portions of the Drawings and Specifications.

1.4 SUBMITTALS

- A. Submit manufacturer's data for review before any work is commenced.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Materials listed in subsequent paragraphs of this specification are those used as basis of design; alternate manufacturer's equivalent projects as listed herein will be accepted. The insulation contractor shall verify materials and comply with requirements of NFPA 90, with regard to a flame spread rating of 25 or less and; a smoke developed/fuel contributed value of less than 50.

2.2 MATERIALS

A. Insulation and accessory materials to be as manufactured by the listed manufacturers or approved equal:

1. Fiberglass: Owens Corning, Knauf, CertainTeed, or Manville.
2. Foamed Plastic Insulation: Armstrong "Armaflex", U.S. Rubber "Ensolex", Gustin Bacon "Ultra-Foam", Owens Corning "O-C" Halstead Industrial Products, or approved equal.
3. Extruded Polyethylene Insulation: Nomaco Inc. "Thermacell, Sentinel Energy Savings Products Division of Packaging Energy Groups, Inc., "Senflex" or approved equal.
4. Insulating Finish Cement: JM No. 301, BH Improved Super Powerhouse Cement, The Ruberoid Co., No. 412, or approved equal.
5. Mastics, Sealers and Adhesives:

	<u>Benjamin Foster</u>	<u>Insulcoustic</u>	<u>Childers</u>	<u>J-M</u>
General purpose mastic	35-00 Series Vi AC Mastic		CP-10	375
Vapor barrier sealant (indoor)	30-35	IC-501	CP-30	
Adhesive	85-20		CP-89	
Fire retardant sealer (outdoor)	60-35	IC-531		
Foamed Plastic & Adhesive				57
Extruded Polyethylene	Therma-Cel 950 Adhesive			

6. Pipe Jacketing and Valve Covers (Ultra Violet Resistant): Zeston PVC, CEEL-Tite, Proto Corp. (Lo Smoke), or approved equal.
7. Molded Fiberglass Fitting Insulation: Molded Acoustical Products, Inc., West Easton, PA, 18042 or approved equal.

PART 3 - EXECUTION

3.1 GENERAL

- A. Insulation is not to be installed until the piping systems have been checked and found free of all leaks. Surfaces shall be clean and dry before attempting to apply insulation. A professional insulator with adequate experience and ability shall install insulation.
- B. Provide hanger or pipe support shields of 16 gage (minimum) galvanized steel over or embedded in the insulation. Shield shall extend halfway up the pipe insulation cover and at least 6" on each side of the hanger. Securely fasten shield with pipe straps at each end. Insulate pipe anchors adequately to prevent moisture condensation problems.
- C. Insulation installed in exposed locations such as water heater rooms, equipment rooms, air handling unit rooms, all exterior above grade areas, kitchens, laundries, power houses, utility buildings, energy building or similarly identified locations where the insulation would be subject to physical damage shall be covered with metal jacketing. Elbows may be covered with fire rated and ozone resistant (for exterior locations) PVC covers in lieu of metal jacket.

3.2 ABOVE GROUND DOMESTIC COLD WATER AND DOMESTIC HOT WATER PIPING

- A. Shall be insulated with ASJ fiberglass pipe insulation. Prior to installing the insulation, the pressure release paper shall be removed from the jacket laps. The insulation shall be secured in place by applying pressure to the pressure sensitive closure system. All fittings shall be insulated with molded fiberglass pipe insulation segments and finished with Foster's 30-35 vapor barrier coating or equal, reinforced with a layer of white open weave glass fabric.
- B. Main pipe sizes 2-1/2" and smaller shall have 1" thickness insulation unless noted on the drawings.
- C. Pipe sizes 2-1/2" and larger shall have 1-1/2" thickness insulation.
- D. Branch runouts up to 2" shall have 1/2" thickness insulation.

3.3 HANDICAP LAVATORY EXPOSED HOT WATER AND WASTE PIPING

- A. Shall be insulated with foamed plastic insulation or extruded polyethylene, one-half inch thickness.
- B. Mitre cut insulation to fit the pipe, fittings and stops.
- C. Use approved cement to seal all joints, seams, and end in the insulation.

END OF SECTION 15465



SECTION 15672 - AIR COOLED CONDENSING UNITS, SEMI-HERMETIC

PART 1 - GENERAL

1.1 SCOPE

- A. Provide packaged semi-hermetic air cooled condensing units of the capacity, operating characteristics, and electrical characteristics indicated on drawings and specified herein.

1.2 SHOP DRAWINGS

- A. Refer to Section entitled "General Mechanical Provisions". Include complete data on: Unit dimensions; minimum operating and service clearances; capacities and rating conditions; maximum operating weights; power consumption; power and control wiring (both factory and field); and operating and safety controls.

1.3 MANUFACTURER

- A. Acceptable: Carrier, Trane, McQuay, Weatherking, York or equal.

1.4 COMPATIBILITY

- A. Each unit must be compatible with evaporator coil arrangements and associated controls to which connected equipment is interfaced.

PART 2 - PRODUCTS

2.1 FRAME

- A. Unit shall be completely factory assembled with all components mounted on a structural steel frame. Compressor and condenser fan drives shall be mounted on structural support members.

2.2 COMPRESSOR HOUSING

- A. The compressor(s) shall be completely housed in a separate compartment with access panels arranged to allow easy access to all components.

2.3 FINISH

- A. The frame, all structural members, and sheet metal panels shall be properly cleaned, painted with a zinc rich primer, and finished with alkyd enamel.

2.4 COMPRESSOR

- A. The unit compressor(s) shall be of the semi-hermetic (serviceable) reciprocating type with: forced feed oil system, with magnetic plug and wire strainer; crankcase heater; foam breaker; and removable cylinder heads. Compressor shall operate at not more than 1750 RPC and shall incorporate unloaded start and multiple step capacity control.

2.5 COMPRESSOR MOTOR

- A. Suction gas cooled and sized for continuous operation over the full range of operating conditions indicated and with voltage variations indicated in the National Electric Code. Motor running protection shall be provided by temperature sensors embedded in the motor windings and by three phase thermal overload relays.

2.6 STARTER

- A. Shall be across-the-line type or as otherwise indicated.

2.7 CONDENSER

- A. Seamless copper tubes with mechanically bonded aluminum fins, tested at 425 psig, and incorporating built-in, separate circuit, sub-coolers.

2.8 CONDENSER FANS

- A. Direct drive, propeller type with fan guards. Fan motors shall have three phase thermal overload relays for running protection.

2.9 REFRIGERANT CONTROLS

- A. The unit shall be equipped with the following: Short cycle protection; low pressure failure switch; electrically operated compressor unloaders; low ambient starting control; low ambient operating controls as required to operate down to the indicated ambient.

2.10 OPERATING CONTROLS

- A. Provide capacity control by actuating unloader solenoids to activate unloaders in cylinder liners of the compressor in response to suction pressure unloader or as otherwise indicated.

2.11 FACTORY PREWIRING

- A. Unit shall be factory wired with power connections brought out to a single set of terminal lugs for field connection. Compressor crank case heaters shall be brought out to a separate set of terminals for field connection to a 120 volt power source. Unit controls shall be 120 volts with power supplied from the 120 volt circuit.

PART 3 - EXECUTION

3.1 UNIT PLACEMENT

- A. The unit location shall be essentially as shown on drawings; however, actual placement shall be verified using field measurements and data relating to the equipment approved for actual installation on this project.

3.2 COORDINATION

- A. Refer to Sections describing refrigerant piping systems and air handling units with DX refrigerant coils. Provide all piping, hangers, supports, valves, and specialty items as required for a complete and operable system.

3.3 VIBRATION CONTROL

- A. Refer to Section entitled "Vibration Isolation" for vibration control.

3.4 MANUFACTURER'S FIELD SUPERVISION

- A. The Contractor shall provide an authorized representative of the unit manufacturer who shall personally supervise: the checkout of all field wiring; unit startup; and unit test and balance including control calibration. The manufacturer shall furnish the Owner with a letter certifying that the unit is properly installed, adjusted, balanced, and will perform in accordance with the requirements of plans and specifications.

3.5 TEST AND BALANCE

- A. Refer to Sections describing tests and balancing.

END OF SECTION 15672



SECTION 15852 - AIR HANDLING UNITS, SPLIT SYSTEM

PART 1 - GENERAL

1.1 SCOPE

- A. Furnish and install medium duty factory packaged air handling units with direct expansion refrigerant coils of the types, sizes, and capacities indicated.

1.2 SHOP DRAWINGS

- A. Refer to Section entitled "General Mechanical Provisions". Include complete performance data at the scheduled operating conditions, dimensions; weights; fan performance curves, airside pressure losses; waterside pressure losses; coil descriptions; and fan discharge and radiated sound power levels, by octave bands, at the stated conditions.

1.3 CERTIFICATION

- A. Equipment performance ratings shall be certified as follows:
 - 1. Fans: AMCA Bulletin 210 or ARI Standard 430.
 - 2. Coils: ARI Standard 210-79.

1.4 MANUFACTURER

- A. Basis of design: As scheduled on the drawings.
- B. Acceptable: As scheduled on drawings.

1.5 COMPATIBILITY

- A. Each unit must be compatible with the condensing units(s) to which it is matched. This includes unit arrangement/configuration, capacity, associated controls, piping and all other connected equipment to which the unit and its components are interfaced.

PART 2 - PRODUCTS

2.1 CASING

- A. Unit casings shall be fabricated of mill galvanized steel reinforced with formed "hat" channels or steel angle iron frames and bracing to provide a rigid assembly. Casing shall be provided with removable panels for access to and removal of coils, dampers and fans in external units. Provide hinged access door for access to and removal of fans and drives in internal drive units.

2.2 DRAIN PAN

- A. Unit drain pan shall be of the double wall internally insulated type with welded seams. Drain pan in draw-thru units shall extend under both the fan and coils sections and in blow-thru units under the entire coil and plenum section.

2.3 DIRECT EXPANSION REFRIGERANT COOLING COILS

- A. Provide direct expansion refrigerant cooling coil of copper tubes with aluminum fins mechanically bonded thereto, circuited to provide proper refrigerant velocities, properly matched with compressor-condenser assembly for proper operation, with expansion valves selected for optimum refrigerant flow from 20% to 100% full load.

2.4 ELECTRIC HEATING COILS

- A. Where electric heating coils are shown or scheduled to be integral with the air handling unit, each such coil shall be as follows:
 - 1. Factory assembled and prewired. Heater capacities, sizes and operating characteristics shall be as scheduled on drawings or as indicated in other sections.
 - 2. Meet all applicable requirements of the current NEC.
 - 3. UL listed including all built-in components.
 - 4. Coordinated with the specified requirements of the mechanical system control system.
 - 5. Provided in capacity control steps indicated or scheduled. If not otherwise indicated, heaters over 10 KW shall have heating elements sequenced on and off in 5 KW increments, and shall be wired for 2 stage operation. All heaters shall be equipped with both thermal and current overload devices, and the required heating and cooling system controls.

2.5 FANS

- A. Fans shall be individually selected to best suit the air quantities and pressures scheduled. Fans handling less than eighteen thousand (18,000) cubic feet per minute, at four and one-half (4-1/2) inches or less static pressure may be of the forward curved blade centrifugal type. Fans handling eighteen thousand (18,000) cubic feet per minute or more or operating at more than four and one-half (4-1/2) inches static pressure shall be of the backward inclined airfoil blade centrifugal type. All fans shall be double width, double inlet type. Fans and shafts shall be selected to operate not less than twenty-five percent (25%) below their first critical speed, statically and dynamically balanced, and keyed to the shafts. Shafts shall be of the hollow large diameter type with tapered and strengthened ends where they extend entirely through the casing and shall be solid steel for fans having drives within the casing. Shafts shall be turned and shall be ground and polished at bearing and fan mounting points.

2.6 BEARINGS

- A. Provide regreaseable ball types selected for an average life of 200,000 hours at design operating conditions. Bearings shall have grease line extended to the drive side of the fan casing of the drive side of the fan scroll for internal drive fans.

2.7 DRIVES AND MOTORS

- A. Provide guards for internal and external drive fans.

2.8 INSULATION

- A. The entire air handling unit casing (including accessory sections), including structural frame and channels shall be insulated from contact with the air stream. Insulate using one inch (1") thick, three (3) pound per cubic foot density fiberglass duct liner having a neoprene stabilized face toward the air stream. The insulation shall be secured using a full coverage insulation and adhesives shall comply with the requirements of NFPA 90A as to flame spread and smoke developed ratings.

2.9 FILTERS

- A. See section describing air filters.

2.10 OVERALL CONSTRUCTION

- A. Shall be as recommended by the manufacturer for operation at the indicated conditions.

2.11 OTHER REQUIREMENTS

- A. Be horizontal or vertical configuration (as applicable).
- B. Cooling coils shall not have face velocities in excess of 500 fpm unless otherwise indicated on drawings schedule (in such case, velocity obtained from drawing schedule (in such case, velocity obtained from drawings schedule shall be upper limit).
- C. Units shall be provided which will perform as indicated with proper consideration of any correction factors which are applicable to system unit casing configuration.
- D. Heating coils, if required, shall be located in reheat position unless otherwise indicated.
- E. Provide with low Voltage wall thermostat.

PART 3 - INSTALLATION

3.1 EQUIPMENT PLACEMENT

- A. Air handling equipment shall be located essentially as shown on drawings; however, actual placement of the unit shall be verified using field measurements and data relating to the units approved for actual installation on this project.

3.2 WIRING

- A. Where units utilize internal drives, conduit penetrations shall be provided by the manufacturer. The conduit openings shall be located on the drive side and positioned so as not to compromise access to any portion of the unit. The opening shall be provided with effective seals and the edges of the internal insulation shall be properly sealed.

3.3 SOUND AND VIBRATION CONTROL

- A. Refer to other sections for airside sound control and vibration control. Mount isolators using height saving brackets where required to reduce operating height of unit to suit space available.

3.4 DUCT CONNECTIONS

- A. Supply and return ducts and combination filter mixing boxes shall be connected to their respective air handler using flexible connectors. Connectors shall be properly installed so that they are not in tension and are aligned with their respective ducts.

3.5 HOUSEKEEPING PAD

- A. Provide 4 inch high reinforced concrete (with 10 x 10 WWP) housekeeping pad for each floor mounted unit. The housekeeping pad shall extend 6 inches beyond the unit base in all directions and shall be continuous beneath the base. Pads shall have chamfered edges and shall be poured and finished smooth and level.

3.6 OTHER REQUIREMENTS

- A. Properly connect all piping.
- B. Allow adequate space for all service and operational clearances necessary.

END OF SECTION 15852

SECTION 15866 - FANS: CENTRIFUGAL, CEILING MOUNTED

PART 1 - GENERAL

1.1 SCOPE

- A. Provide ceiling mounted light duty centrifugal fans with characteristics indicated.

1.2 SHOP DRAWINGS

- A. Refer to requirements of Section entitled "General Mechanical Provisions".

1.3 CERTIFIED PERFORMANCE

- A. Be AMCA certified as to both sound and performance ratings.

1.4 MANUFACTURER

- A. Design Basis: Basis of design is similar to Acme Master-ette Model V Series and Greenheck CSP Series or as scheduled on drawings.
- B. Acceptable Manufacturers: Greenheck Fan and Ventilator Corporation; Ilg Industries, Inc.; Powerline, Inc.; Power Ventilator Company, Loren Cook Company; Acme Engineering and Manufacturing Corporation; Penn Ventilator Company or equal.

PART 2 - PRODUCTS

2.1 FAN HOUSING

- A. Fan housing including longitudinal, traverse, and diagonal stiffeners, motor mounts, bearing and drive supports shall be constructed of steel. Entire fan housing shall be internally lined with 1/2-inch thick or greater, three pound per cubic foot density fiberglass acoustical duct liner with a stabilized surface. Liner shall be held in place with adhesive and mechanical fasteners. All insulation and adhesives shall meet requirements of NFPA 90A as to flame spread and smoke developed ratings. Housing, including all bracing, stiffeners and motor mounted assembly shall be factory finished with a baked on alkyd enamel finish over a corrosion resistant primer. Removable panel in bottom of housing for complete access to motor and fan.

2.2 CEILING INLET GRILLE

- A. Steel or aluminum: baked enamel finish.

2.3 FAN WHEEL

- A. Shall be centrifugal type and shall be statically and dynamically balanced. Single or twin impeller as necessary to provide indicated performance.

2.4 FAN MOTOR

- A. Permanently lubricated shaded pole motor mounted on resilient isolators to minimize vibration and noise.

2.5 BACK DAMPER

- A. Mounted in throat of fan discharge.

2.6 DRIVE ASSEMBLY

- A. Drive shall be direct drive type as indicated on drawings, and shall conform with the requirements of Section entitled "General Mechanical Provisions".

2.7 DISCONNECT SWITCH

- A. Fans shall include factory mounted disconnect switches prewired to the drive motor.

2.8 SPEED CONTROL

- A. Solid state speed controller for speed reduction to 40% Mounted on housing or as otherwise indicated.

PART 3 - EXECUTION

3.1 PLACEMENT AND MOUNTING

- A. Fan locations shall be essentially as shown on drawings; however, actual fan placement shall be verified using field measurements and data relating to equipment approved for actual installation on this project. Mount fan in strict accordance with manufacturer's instructions.

3.2 TEST AND BALANCE

- A. All fan performance shall be certified by test and balance procedures as specified in section describing test and balance procedures.

END OF SECTION 15866

SECTION 15890 - DUCTWORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SCOPE

- A. Provide complete duct systems as indicated. Systems shall include, but not be limited to, the following: outside air, exhaust air, and air conditioning supply and return air duct systems as shown on drawings. Drawing scales prohibit the indication of all offsets, fittings, and like items; however, these items shall be installed as required for the actual project conditions at no change in contract price.
- B. Items Included: This section generally includes, but is not limited to, the following major items:
 - 1. Low pressure fiberglass ductwork.
 - 2. Low pressure flexible ducts.

1.3 RELATION TO OTHER WORK

- A. Refer to the section, "General Mechanical Provisions" for related requirements. Refer to other sections of Division 15 and to other applicable portions of the Drawings and Specifications.
- B. This section is directly related in particular to sections (which may or may not be included in this division) which describe the following:
 - 1. Sections describing air handling equipment and fans.
 - 2. Air distribution devices.
 - 3. Duct system accessories.
 - 4. Insulation.
- C. Coordinate shop drawings, ordering, delivery, and placement of all items affecting the duct systems including, but not limited to, the following items: air handling units, exhaust fans, supply fans, access panels, air distribution devices, filters, structural framing, roof construction, roofing, and the work of all trades to insure an orderly and timely progression of the work. Refer to the requirements of Section entitled "General Mechanical Provisions".
- D. Refer to other sections which may describe additional sound attenuation measures which may relate to this section.

1.4 SHOP DRAWINGS

- A. Refer to Section entitled "General Mechanical Provisions". Include complete data as applicable to this project on: all prefabricated duct and fittings; duct liner including mechanical fasteners and adhesives; duct sealing materials; duct joining and seaming methods; and all other items. If required by Architect, prepare and submit for approval completely detailed shop drawings of supply and return ductwork from any or each air handling unit through its transitions, bends and elbows until such ducts are extended beyond the air handling unit equipment area and/or congested areas; these shop drawings will not be required unless specifically called for elsewhere or unless significant deviation from the Drawings is necessitated by the equipment provided.

1.5 OTHER REQUIREMENTS

- A. Provide all ductwork and components thereof in accord with manufacturer's recommendations. All ductwork dimensions indicated are nominal free clearance internal dimensions which do not include insulation thickness.

1.6 DEFINITIONS

- A. "SMACNA" means "Sheet Metal and Air Conditioning Contractors National Association, Inc."
- B. Low Pressure Ductwork: Any and all ductwork conveying air or other gases at velocities less than 2500 fpm and static pressure less than 2.0 inches wg. This ductwork may also be referred to in these specifications as "Low Velocity Ductwork". SMACNA "HVAC Duct Construction Standards, Metal and Flexible", First Edition, 1985, shall govern construction of this ductwork unless otherwise specified.

1.7 PRESSURE/VELOCITY CLASSIFICATIONS

- A. Pressure and velocity classifications (hereinafter called "P/VC") for ducts are defined as follows:

P/VC Desig.	SMACNA Pressure Class	Static Pressure Rating	Positive or Negative Pressure	SMACNA Seal Class	Maximum Velocity (fpm)
2	Low	2"	+ or -	C	2500 dn
1	Low	1"	+ or -	C	2500 dn
1/2	Low	1/2"	+ or -	C	2000 dn

- B. See Part 3, EXECUTION, of this section for duct sealing requirements.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Materials shall comply with current SMACNA standards.

DUCTWORK

2.2 LOW PRESSURE FIBERGLASS DUCTWORK

- A. Material: One inch (1-1/2") thick glass fiber ductboard, meeting requirements of NFPA 90A and shall have a factory applied UL 181, Class 1 air duct listing label. Board shall be faced with aluminum foil.
1. Fabricated from or lined with non-corrosive, non-hygroscopic, permanently odorless, resilient, long staple, fabric grade glass fibers preformed into semi-rigid or rigid board.
 2. Flexural rigidity rating of 800EI per ASTM test number D 1037 64 where neither width nor depth or duct exceeds 48 inches.
 3. Flexural rigidity rating of 1400EI per ASTM test number D 1037 64 where width or depth exceeds or equals 48 inches.
 4. Non-erosive when conveying air at velocities equal to or less than 2000 fpm.
 5. Approved, fire retardant, moisture sealing, factory-applied jacket made of kraft paper and 2 mil minimum thickness aluminum foil.
 6. Maximum thermal conductivity of 0.23 at 75°F mean temperature.
- B. Fabrication: Ductwork fabrication shall be in accordance with SMACNA Fibrous Glass Manual, Duct Construction Standards, and current manufacturer's literature on approved fabrication methods.
- C. Closure Systems: Closure systems shall be as specified by manufacturer of the ductboard to maintain the UL Class 1 duct label. Provide closure of all joints using 9/16" outward clinch staples, approximately two inches (2") wide pressure sensitive tape. Use factory molded male-female joints wherever possible. Use appropriate UL and SMACNA approved tapes.
- D. Acceptable Products: Johns-Manville Micro-Aire Type 475 or 800 as applicable; Owens Corning Fiberglass Type 800FR or 1400FR as applicable; or approved equal.

2.3 LOW PRESSURE FLEXIBLE DUCTS

- A. General:
1. The inclusion of flexible ducts in this specification shall not be construed as approval of use on the project unless specifically shown on the Drawings.
 2. Where used, provide in factory finished lengths not in excess of lengths required to make kink-free connections with minimum air pressure drop.
- B. Insulated flexible ducts: Flexible duct shall be factory-fabricated preinsulated type with seamless vapor barrier. Duct shall bear UL 181 Class 1 Air Duct label and shall comply with NFPA 90A and 90B. Fiberglass insulation nominal 1" thickness with thermal conductance of 0.23 BTU/hr-ft²-

°F maximum at 75°F mean temperature. Flexible duct shall have an operating range of minus 0.5" w.g. to plus 2" w.g. Core shall be continuous and consist of aluminized mylar laminated to corrosion resistant steel wire helix. Vapor barrier perm rating shall be 0.17 maximum per ASTM E96-A. Maximum working velocity shall be 4000 FPM. Flexible duct shall be Genflex SLR-25, Clevaflex Type KQ, Wire Mold type WG or approved equal.

- C. Un-insulated flexible ducts, steel: Flexible ductwork shall be constructed of all metal one ply hot-dipped galvanized steel, closely corrugated for strength and flexibility, with seams interlocked, folded flat, and knurled to insure tightness. Duct shall be listed as #UL181 "Flexible Air Duct", Class 1, and NFPA 90A. Products equal to Clevaform Type GS are acceptable.
- D. Round branch take-off fittings for flexible duct:
 - 1. Round duct branch take-off fitting shall be made of galvanized sheet metal designed for twist-in installation and to assure minimum air loss at the take-off. The fittings shall be of the conical converging type to reduce the pressure drop through the fittings. Provide a raised bead on the throat of the fitting to assure a tight positive connection.
 - 2. Provide each fitting with the following:
 - a. Lockable quadrant damper.
 - b. 45-degree extractor scoop.
 - c. Insulation guard where used with internally lined ductwork.
 - 3. Provide these "spin-in" type fittings at all connections between rigid sheet metal duct and flexible duct at the upstream end of the flexible duct.

PART 3 - EXECUTION

3.1 GENERAL

- A. All duct systems shall be free of noise, chatter, vibration and pulsation under all conditions of operation. Remove, replace or reinforce as directed by the Architect/Engineer if necessary to correct such conditions.
- B. If field conditions are determined to exist which would limit the guarantee of air delivery or system performance, due notice in writing shall be submitted to the Architect/Engineer of such conditions prior to starting fabrication.
- C. Properly support and align ductwork. Ducts to be free of sag and bulge. Hang ductwork below concrete floors or roof deck with hangers set prior to pouring concrete, or from self drilling screw anchors. GUN POWDER SET ANCHORS ARE NOT PERMITTED.

- D. Where it is necessary that ducts be divided due to pipes or other obstructions which must pass through these ducts, the Contractor shall, at locations as noted or directed, provide air-stream deflectors in the duct and the duct shall be increased in size to maintain equivalent area around deflectors. Such changes shall be in accord with standard SMACNA details and shall be shown on Contractor's As-Built Drawings.
- E. Interior of ductwork visible through registers, grilles, or diffusers shall be painted flat black.
- F. Do not route ductwork through transformer vaults and electrical equipment spaces and enclosures.
- G. Construct all ductwork and accessories in accord with the latest indicated editions of applicable SMACNA construction standards. Sheet Metal and Air Conditioning Contractors' National Association.
- H. Streamline all ductwork to the full extent practical and equip with proper and adequate devices to assure proper balance and quiet draftless distribution of indicated air quantities.
- I. Protect all ductwork and system accessories from damage during construction until Architect/Engineer's final acceptance of project.
- J. Prior to ductwork fabrication, verify if all ductwork as dimensioned and generally shown will satisfactorily fit allocated spaces. Take precautions to avoid space interferences with beams, columns, joists, pipes, lights, conduit, other ducts, equipment, etc. Notify Architect/Engineer if any spatial conflicts exist, and then obtain Architect/Engineer's approval of necessary routing. Make any such necessary revisions which are minor at no additional cost.
- K. Carefully correlate all duct connections to air handling units and fans to provide proper connections, elbows and bends which minimize noise and pressure drop.
- L. Provide all curved elbows with radius ratios of not less than 1.5 unless otherwise shown or approved by Architect/Engineer. Provide all mitered elbows with turning vanes.
- M. Properly suspend all ductwork so that no objectionable conditions result (such as vibration, sagging, etc.).
- N. Coordinate any and all dimensions at interfaces of dissimilar type of ductwork and at interfaces of ductwork with equipment so that proper overlaps, interfaces, etc., of insulation and continuity of vapor barriers are maintained.
- O. If necessary where ducts interface and have different types of insulation, provide transitions so that internal free-clear dimensions of duct remain unchanged.
- P. Install horizontal low pressure ductwork at a level which maximizes length of any vertical, rectangular or round rigid duct connections to rectangular diffuser necks; however, such vertical duct connections are not required to be over 24 inches in length.

- Q. Make connections from any low pressure ductwork to terminal units (fan terminal units, variable volume boxes, etc.) with appropriate lengths of flexible duct unless other type of connection is indicated.
- R. Install all flexible round duct without kinks or similar obstructions so that pressure drop is minimized. Cut and remove excess lengths as necessary.
- S. Install horizontal rigid ductwork as high as practical above suspended ceilings so that movable light fixtures may be relocated without interference to meet any future partition relocation requirements.

3.2 FIBERGLASS DUCT

- A. Provide all reinforcement, bracing, suspension, workmanship and construction details for this ductwork and its accessories in strict accord with the recommendations of the Sheet Metal and Air Conditioning Contractors' National Association Fibrous Glass Duct Construction Standards or in accord with the manufacturer's recommendations, whichever is more stringent. Completed duct system(s) shall be stable and airtight at 2 inches w.g. internal static pressure. Comply with the reinforcement schedule for rectangular fiber glass air ducts as published in the SMACNA Standard.
- B. Entirely comply with NFPA Bulletin 90A and be Class I by UL-181.
- C. Miter all longitudinal corners (except seams) with jacket undisturbed.
- D. Provide ship lap construction with 1-1/2 inch minimum tape overlap on all sides of all longitudinal seams and transverse joints.
- E. All joints shall be fiber glass tape and mastic providing a UL-181 Duct Systems Class I rating.
- F. Round cross-section ducts shall be factory molded.
- G. Square and rectangular ducts shall be shop or field fabricated from flat ductboard.
- H. Metallic duct reinforcement support, and duct heater sleeves shall be galvanized steel.
- I. Fabricate offsets, turns and elbows with centerline radius equal to 1- 1/2 times diameter when possible. No mitered offsets will be allowed. Provide double turning vanes to assist in smooth flow of air in square elbows or elbows with centerline radius less than duct width or diameter.
- J. Taped joints on fiber glass ductwork shall be made by first taping the joint, then stapling through the tape on both sides of the joint interface, and then adding another layer of tape over the stapled and taped joint. Staples shall be in pairs with one staple on each side of the joint interface and with a distance between staple pairs of not greater than 3 inches as measured around the perimeter of the taped joints. Staples shall be minimum 1/2" x 1/2".

3.3 LOW PRESSURE FLEXIBLE DUCTS

- A. Flexible ducts shall not be used unless specifically indicated on drawings.

B. If flexible duct is indicated for use on this project, it must comply with the following requirements.

1. The extent of the use of flexible ductwork shall be limited to that shown on the drawings.
2. Flexible duct installation shall be per SMACNA Flexible Duct Installation Standards, and manufacturers latest printed instructions, whichever is stricter. In addition the following shall apply:
 - a. Flexible duct between rigid duct and diffusers shall be a MAXIMUM of 8 feet in length and shall be fully extended with a maximum equivalent of (2) 90 degree bends (no bend shall be made with centerline radius of less than one duct diameter). No additional flexible duct shall be provided for future terminal device relocation unless otherwise specified.
 - b. Flexible duct shall be supported at ends and at each 90 degree bend. Maximum permissible sag is 1/2 inch per foot of spacing between supports.
 - c. Hanger or saddle material in contact with the flexible duct shall be of sufficient width to prevent any restriction of the internal diameter of the duct when the weight of the supported section rests on the hanger or saddle material. In no case will the material contacting the flexible duct be less than 1 inch wide. Narrower hanger material may be used in conjunction with a sheet metal saddle which meets the foregoing specifications. This saddle must be formed to cover one-half the circumference of the outside diameter of the flexible duct and must be rolled to fit neatly around the lower half of the duct's outer circumference.
 - d. Factory installed suspension systems integral to the flexible duct are an acceptable alternative hanging method when manufacturers recommended procedures are followed.
 - e. Hangers shall be adequately attached to the building structure (not pipe, conduit, etc.).
 - f. To prevent tearing of vapor barrier, do not support entire weight of flexible duct on any one hanger during installation. Avoid contact of flexible duct with sharp edges of hanger material. Damage to vapor barrier may be repaired with approved tape. If internal core is penetrated, replace flexible duct or treat as a connection.

3.4 MISCELLANEOUS DUCT SYSTEM COMPONENTS

- A. Spin-In Take-Off Fittings: Install around duct branch takeoff fittings according to manufacturer's installation instruction. Additionally seal fitting to rectangular duct with a thin bead of mastic sealant.

3.5 HANGERS AND SUPPORTS

- A. General: Comply with latest applicable SMACNA construction standard. Where sprayed fireproofing occurs, install hangers before application of such treatment and withhold installation of ducts until after application.
- B. Supports: Vertical risers and other duct runs where the method of support specified above is not applicable shall be supported by substantial angle brackets designed to meet field conditions and installed to allow for duct expansion.
- C. Fasteners: Secure hangers to steel beams or metal deck with beam clamps or drop through connections from the metal or concrete deck.

3.6 CHANGES IN SHAPE OR DIMENSION

- A. Where duct size or shape is changed to effect a change in area, the following shall apply:
 - 1. Where the area at the end of the transformation results in an increase in area over that at the beginning, the slope of the transformation shall not exceed one inch in seven inches.
 - 2. Where the area at the end of the transformation results in a decrease in area from that at the beginning, the slope of the transformation may be one inch in four inches, but one inch in seven inches is preferable, space permitting.
 - 3. The angle of transformation at connections to heating coils or other equipment shall not exceed thirty degrees from a line parallel to the air flow on the entering side of the equipment, nor fifteen degrees on the leaving side. The angle of approach may be increased to suit limited space conditions when the transformation is provided with vanes approved by the Architect/Engineer.

3.7 CHANGES IN DIRECTION

- A. Changes in direction shall be basically as indicated on the drawings and the following shall apply:
 - 1. Supply duct turns of ninety degrees in low pressure duct shall be made with mitered elbows fitted with closely spaced turning vanes designed for maintaining a constant velocity through the elbow.
 - 2. Return and exhaust duct turns of ninety degrees in low pressure duct shall be made with mitered elbows, as specified hereinbefore for supply ducts, unless radius elbows are indicated in which case they shall be constructed with a turning radius one and one-half (1-1/2) times the width (with width considered as the dimension in the plane of the turn) as measured to the duct centerline.
 - 3. Tees in low pressure duct shall conform to the design requirements specified hereinbefore for elbows.

4. Branch take-offs in low pressure supply duct shall be made with extractors or splitter dampers, as indicated, in square take-offs.
5. In high pressure duct, branch take-offs and connections to flexible duct supplying air to terminal units shall be made with conical taps.

3.8 IMPROPER MATERIALS OR CONFIGURATION

- A. If ductwork materials or ductwork configurations are installed which do not meet these specifications, Contractor shall remove such ductwork and replace with materials or configurations which are acceptable. Any delay in job progress will be the responsibility of the Contractor.

3.9 OTHER REQUIREMENTS

- A. Insulated Duct: Where ducts will be insulated, make provision for neat insulation finish around damper operating quadrants, splitter adjusting clamps, access doors, and similar operating devices. A metal collar equivalent in depth to insulation thickness and of suitable size to which insulation may be finished shall be mounted on duct.
- B. Control Devices: Properly install all control related devices which are part of the duct systems. See Section(s) describing control systems.

3.10 SEALING OF DUCTS

- A. Duct seal classes are as follows:
 1. Seal class "C": Seal all transverse joints. Use for P/VC-2 (2" w.g.) and lower unless otherwise indicated.
- B. Where sealing is required it shall mean the following:
 1. The use of adhesives, gaskets, tape systems or combinations thereof to close openings in the surface of the ductwork and field-erected plenums and casings through which air leakage would occur; or
 2. The prudent selection and application of sealing methods by fabricators and installers, giving due consideration to the designated pressure class, pressure mode (positive or negative), chemical compatibility of the closure system, potential movement of mating parts, workmanship, amount and type of handling; cleanliness of surfaces, product shelf life, curing time and manufacturer-identified exposure limitations;
 3. That these provisions are applicable to duct connections to equipment and to apparatus but are not for equipment and apparatus;

C. Materials and applications for sealing ducts:

1. General:

- a. Complete product data on all materials used for sealing ducts must be submitted for approval prior to any duct fabrication.
- b. All sealants must be specifically recommended by their manufacturer for the purpose of sealing ducts.

2. Liquid Sealant:

- a. Use only for slip type joints where sealant is to fill small space between overlapping pieces of metal. Do not use where metal clearances exceed 1/32-inch.
- b. Sealant must be specifically manufactured for the purpose of sealing ducts.

3. Mastics:

- a. Use in lieu of liquid sealant at Contractor's option.
- b. Use as a fillet, in grooves and between flanges.
- c. Do not use oil base caulking or glazing compounds.

4. Gaskets:

- a. Use soft elastomer butyl or neoprene rubber or extruded forms of sealants in flanged joints in addition to mastic.

5. Tape:

- a. Tape is not allowed on sheet metal ducts.

6. Combination of mastic and embedded fabric:

- a. Use mastic/mesh/mastic as a sealant where pressure/velocity classification equals and exceed P/VC-3 and where any spaces between metal surfaces at transverse joints or longitudinal seams or duct wall penetrations exceeds 1/16-inch.
- b. Apply glove coat of mastic, then embed a continuous or overlapping strip of not less than 4-inch wide 10 x 10 fiberglass cloth into the mastic, then apply a final glove coat of mastic over the glass cloth.

7. Surface preparation:

- a. Surfaces to receive sealant should be adequately clean (free from oil, dust, dirt, rust, moisture, ice crystals and other substances that inhibit or prevent bonding). Use solvent and/or apply a face primer if necessary to obtain adequately clean surface for adhesion.

END OF SECTION 15890



SECTION 15897 - FILTER ASSEMBLIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SCOPE

- A. Furnish and install complete air filter assemblies of the types, sizes and capacities indicated.

1.3 RELATION TO OTHER WORK

- A. Refer to the section, "General Mechanical Provisions", for related requirements. Refer to other sections of Division 15 and to all other applicable portions of the Drawings and Specifications.

1.4 SHOP DRAWINGS

- A. Include complete performance data at the scheduled operating conditions; dimensions; weights; performance curves; airside pressure losses; quantities; descriptions; and any other necessary information.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Filters shall pass applicable air quantities at velocities and pressure drops which are within manufacturer's recommended operating ranges and as specified and scheduled.
- B. Filter Manufacturers: Continental; American Air Filter; Cambridge; Farr; Flanders; Purafil; or equivalent.
- C. Air Handling Unit Filter Sections: Shall be of adequate size to accept specified filters. Air handling unit filter sections shall be factory made by air handling unit manufacturer or by filter manufacturer to be specifically compatible with applicable air handling unit.

2.2 REPLACEABLE THROWAWAY FILTERS FOR AIR HANDLING UNITS

- A. Filter Housing: Integral part of air handling unit assembly. (If not part of AHU assembly, provide external filter housing.)

- B. Filters: Extended surface, pleated panel type; disposable; double-wall chipboard frame with diagonal support members; 1-inches thick; average efficiency no less than 25-30% based on ASHRAE 52-76 test method; operate at an initial resistance of not more than 0.25-inches w.g.s.p. at 500 fpm face velocity. Design base: Farr 30/30.

PART 3 - EXECUTION

3.1 GENERAL

- A. Arrangement and Access: Arrange, install and make provisions for easy access to and removal and replacement of filters. Provide access doors and/or panels as necessary.
- B. Coordination and Matching: Coordinate assembly components and properly match sizes and quantities of filters with related air moving systems (e.g., air handling units, fan coil units, filter banks) so that filter assemblies will operate in accord with operating conditions, sizes and capacities as listed in this section or as otherwise indicated.

3.2 ORIGINAL AND SPARE FILTER SETS

- A. Provide an original filter set and two (2) spare filter sets for each unit having an air handling equipment filter assembly specified above. Upon initial start-up, each filter assembly shall be provided with a complete original filter set. Prior to or at the time of final test and balance, this original filter set shall be replaced with a complete new spare filter set. However, if at the time of final test and balance there is still useful operating life remaining in the initial filter set (i.e. the filters are still operating within their recommended pressure drop limits for the particular application), then the Contractor (if he is given written approval by the final test and balance agency) may give the spare filter sets to the Owner (at a place of the Owner's selection on the site) in lieu of replacing the original filters with the spare filters.

END OF SECTION 15897

SECTION 15910 - DUCT SYSTEM ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SCOPE

- A. Provide all necessary duct system accessories to assure proper balance, quiet and draftless distribution and conveyance, and minimization of turbulence, noise and pressure drop for all supply return, exhaust and ventilation air quantities indicated.
- B. Items Included: This section generally includes, but is not limited to, the following items as may be applicable to this project:
 - 1. Flexible duct connections.
 - 2. Splitters.
 - 3. Turning vanes.
 - 4. Extractors.
 - 5. Manual volume dampers.
 - 6. Access doors.

1.3 RELATION TO OTHER WORK

- A. Refer to the section, "General Mechanical Provisions", for related requirements. Refer to other sections of Division 15 and to all other applicable portions of the Drawings and Specifications.
- B. This section directly relates in particular to sections (which may or may not be included in this division) which describe the following:
 - 1. Ductwork.
 - 2. Air distribution devices.
 - 3. All types of air handling equipment.

1.4 COORDINATION

- A. Coordinate all items affecting the duct systems including but not limited to the following items: air handling units, exhaust fans, supply fans, sound attenuators, duct mounted coils, access panels air distribution devices, fire dampers, outside air louvers, hoods, filters, roof curbs, structural framing, roof construction, roofing, and the work of all trades to insure an orderly and timely progression of the work.

1.5 SHOP DRAWINGS

- A. Include complete data on: access doors; flexible connectors; manual volume dampers including operating hardware; extractors; turning vanes; automatic shutters and all other items.
- B. See section entitled, "General Mechanical Provisions".

1.6 OTHER REQUIREMENTS

- A. Provide all components in accordance with manufacturer's recommendations.
- B. All ductwork dimensions indicated which may affect items of this section are nominal free clearance internal dimensions which do not include insulation thickness.

1.7 DEFINITIONS

- A. "SMACNA" means "Sheet Metal and Air Conditioning Contractors National Association, Inc.".

PART 2 - PRODUCTS

2.1 GENERAL

- A. Be recommended by the manufacturer for the application.
- B. Products listed in this Section or on the plans are based on a specific manufacturer to establish the desired style, quality and type. Equivalent products, complying with the requirements of this Section and the installation requirements of the plans, by the following manufacturers are acceptable:
 - 1. Ventfabrics
 - 2. Barber-Colman
 - 3. Tuttle & Bailey
 - 4. Dura-Dyne
 - 5. Airsan
 - 6. Titus
 - 7. Anemostat
 - 8. Young
 - 9. Metalaire
 - 10. United McGill
- C. Products which are specified may not necessarily all be required on the projects; provide those products which are applicable.

2.2 FLEXIBLE DUCT CONNECTIONS

- A. Provided where air handlers, fans and blowers connect to their ductwork.
- B. At least 4 inches long.
- C. Connected on each side to metal (either metal ductwork, air handling apparatus, or heavy gauge steel sleeves).
- D. For use in high and/or low pressure duct systems.
- E. Ventfabrics, Inc., "Ventglas Metaledge", or equivalent.

2.3 SPLITTERS

- A. Provide for adjustment of air volume to their respective branches, where indicated. Constructed of at least the same gage galvanized steel as the duct wherein they are used, and in no instance by less than twenty-two (22) US gauge. Use in low pressure duct systems only. Be adequately sized to close off air to applicable branches. Rigidly attached to pivot rod and operating linkage. Install on raised insulated base when used in internally insulated ductwork. Splitter blades; formed in two thicknesses of metal so that entering edge presents rounded nose to air flow; length no less than one and one half times the width of the smaller branch served or twelve inches, whichever is larger. Hardware used for the construction, assembly, and operation of splitter dampers shall be as follows:
 - 1. Operators for exposed splitters and those located above "lay-in" or accessible ceiling shall be Ventlok #690 splitter damper assembly.
 - 2. Operators for concealed splitters shall be Ventlok #691 with #680 miter and #677 concealed regulator.

2.4 LOW PRESSURE METAL TURNING VANES

- A. Provide in all elbows, bends and tees of all low velocity supply air ducts whether or not shown in detail; provide in all elbows, bends and tees of all other low velocity ducts where portions of such ducts convey air at greater than 700 fpm average velocity. Adequate rigidity and strength to be completely flutterproof; properly designed; permanently fixed type. Aluminum, or steel with acid/solvent chemical corrosion resistant coating, or galvanized steel. Air foil type in all mitered elbows, mitered bends and tees. Air foil type must be manufactured by Titus, Tuttle & Bailey, Anemostat, Waterloo, Metalaire, Barber-Colman or other approved manufacturer. Be Barber-Colman "Airturns", Tuttle and Bailey "Ducturns", or Dura-Dyne "VR" with 24 gauge rails and hollow vanes, or equivalent.

2.5 EXTRACTORS

- A. Provide at rectangular branch duct take-offs.

- B. Use in low pressure duct systems only.
- C. Properly designed to deflect, proportion and direct the indicated air quantities to the branch duct and/or to the registers, grilles or other outlets without causing objectionable noise or pressure drop.
- D. Multivaned and adjustable.
- E. Aluminum, or steel with acid/solvent chemical corrosion resistant coating, or galvanized steel.
- F. Provided with devices for adjusting and securing the position of these deflectors; these devices shall allow adjustment of the deflectors from outside the completed ductwork without necessity for puncturing or otherwise penetrating ductwork and/or its vapor barrier.
- G. Made by Titus, Tuttle and Bailey, Metalaire, Anemostat, Waterloo, Barber-Colman, or equivalent.
- H. Be similar to Titus Model AG-45 or AG-225 Volume Extractor, Tuttle & Bailey Type VCL or VLK Vectrol, Waterloo Type DTM or DT2M Extractor, Anemostat "DTB" or "DTA" or Young Regulator "890" or 890A", or equivalent.

2.6 MANUAL VOLUME DAMPERS

- A. These dampers are to be other than those specified as being integral with each register, diffuser and other air outlet or inlet.
- B. Provided where indicated in the complete air distribution system(s) (including ductwork, return air plenums, etc.) to allow complete balancing of the air supply, return, ventilation and exhaust system(s).
- C. Opposed blade type.
- D. 8" maximum blade width.
- E. Made of galvanized steel, steel with acid/solvent chemical resistant coating, or steel with a sprayed or dipped aluminum rust resistant finish; flutterproof.
- F. Provided so that all damper adjustment can be made from outside the completed ductwork without necessity for puncturing or otherwise penetrating the ductwork and/or its vapor barrier.
- G. Fully adjustable and with locking device.
- H. Manufactured by Titus, Tuttle & Bailey, Anemostat, Waterloo, Metalaire, or equivalent.
- I. Provided at a point in the ductwork which is a sufficient distance upstream from an outlet (or downstream from an inlet) to attenuate objectionable noise due to damper throttling and to preclude adverse effects on the distribution device.

J. Based upon location of the duct in which the damper is to be installed, provide the following types:

1. Dampers in ducts which are exposed or located above "lay-in" or "accessible ceilings": Young Regulator Company Model 817 or equivalent.
2. Dampers in ducts concealed above plaster ceilings or behind dry wall construction: Young Regulator Company Model 817A or equivalent.

K. Use in low pressure duct system only.

2.7 LOW PRESSURE DUCT ACCESS DOORS

- A. Provided for: each manual and motorized damper; fire damper; smoke damper; electric duct heater; and where access is otherwise necessary.
- B. Factory prefabricated double wall insulated type of 24 US gauge galvanized steel (of same or thicker gauge than ductwork panel in which installed, whichever is greater).
- C. Minimum size shall be as large as is compatible with duct size but in no case less than the following (provide larger sizes if necessary to permit proper access operation):

<u>Max. Duct Dimensions</u>	<u>Access Door Size</u>
11" and less	10" x 12"
12" through 16"	12" x 16"
17" and over	16" x 24"

- D. Doors shall be provided with and operated adjustable tension catches and shall be completely gasketed around their perimeters. Doors shall be Ventlok "Access Doors". Install in accordance with manufacturers recommendations using Ventlok #360 sealant or equivalent.

PART 3 - EXECUTION

3.1 GENERAL

- A. Construct and install all accessories in accordance with the latest indicated editions of applicable SMACNA construction standards.
- B. Provide all mitered elbows with turning vanes.
- C. Install all duct system accessories in accordance with manufacturers recommendations.

END OF SECTION 15910



SECTION 15936 - AIR DISTRIBUTION DEVICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SCOPE

- A. Provide all air distribution devices as indicated on the drawings and as specified herein for a complete and operable system.

1.3 RELATION TO OTHER WORK

- A. Refer to the section, "General Mechanical Provisions", for related requirements. Refer to other sections of Division 15 and to all other applicable portions of the Drawings and Specifications.
- B. Coordinate with work of the ceiling, drywall and plastering trades as required to insure an orderly progression of work and a first class finished system with respect to placement, alignment, finish, general fit and absence of conflict with lighting systems and fire protection systems.
- C. Insulate air distribution devices to prevent condensation formation.

1.4 DESIGN CONDITIONS

- A. Acoustical: Noise produced at each diffuser, register, grille or other air distribution device shall not exceed a noise criteria level of NC 35 based on sound pressure levels in db re 0.002 microbars unless otherwise indicated. Coordinate air distribution devices, sound attenuation measures and equipment actually provided to insure that this design constraint is not exceeded by the system installed.

Exceptions: Any particular rooms or areas which are normally occupied by other than maintenance staff or service staff and which may be noted on the drawings as requiring lower NC criteria.

- B. Pressure Drop: Pressure drop across any air distribution device shall not exceed 0.15 in wg static pressure unless otherwise indicated.

1.5 SHOP DRAWINGS

- A. Refer to the requirements of Section entitled "General Mechanical Provisions".

1.6 MANUFACTURER

- A. Products listed in this Section or on the plans are based on a specific manufacturer to establish the desired style, quality and type. Equivalent products, complying with the requirements of this Section and the installation requirements of the plans, by the following manufacturers are acceptable:
 - 1. Titus
 - 2. Anemostat
 - 3. Barber Colman Company
 - 4. Tuttle & Bailey
 - 5. Metalaire
 - 6. Krueger
 - 7. Carnes
- B. Manufacturers must be members of the Air Distribution Council unless otherwise indicated.

1.7 OTHER REQUIREMENTS

- A. All aluminum is to be extruded unless otherwise indicated.
- B. Appearance: Each air distribution device which has a portion thereof (frame, core, etc.) exposed to view in the finished area shall have a factory applied finish which matches and is compatible with the color of the surrounding surface on which the device is installed. Colors must be approved by Architect prior to device fabrication.
- C. Integral Components: All dampers, blank-off baffles and other companion devices which form an integral part of air distribution device shall be factory made items produced by the manufacturer of air distribution device.
- D. Door Grilles: Door grilles may be specified in another division but for reference may also be indicated on mechanical drawings.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Provide air distribution devices as shown and noted on drawings.

2.2 OTHER REQUIREMENTS

- A. All devices must each comply with the applicable portions of the Air Diffusion Council (ADC) Equipment Test Code 1062R4 "Certification, Rating and Test Manual", the Air Movement and Control Association, Inc. (AMCA) Standard 500 "Test Method for Louvers, Dampers and Shutters" and the "National Fire Protection Association" (NFPA) Standard 90A "Installation of Air Conditioning and Ventilating Systems".

- B. Provide ceiling and/or linear diffusers with border styles that are compatible with adjacent ceiling systems, and that are specifically manufactured to fit into ceiling module with accurate fit and adequate support. Refer to general construction drawings and specifications for types of ceiling systems which will contain each type of diffuser.
- C. Diffusers, grilles and registers installed in fire rated ceiling, or floor/ceiling assemblies shall be constructed of steel.
- D. Mounting Screws: Where grilles, diffusers or registers are specified which require mounting screws visible from the face of the device these screws shall be furnished with the air distribution equipment and be finished at the factory to match the finish on the grille, diffuser or register in which they are to be used.

PART 3 - EXECUTION

3.1 GENERAL

- A. Install neatly where indicated in accord with manufacturer's recommendations and in accord with SMACNA recommendations and as otherwise indicated.
- B. Properly test, balance and adjust to produce quiet, draftless operation to best degree possible.

3.2 INSTALLATION

- A. Rectangular Diffusers: Where diffusers are the lay-in type, they shall be supported by the inverted T-bar suspension system but all ducts connected thereto shall be supported independently of the ceiling as specified under Section entitled "Ductwork". Surface mounted diffusers shall be supported by the duct runouts or drops where sheet metal ducts are indicated and by separate hangers where flex runouts are indicated. All rectangular ceiling diffusers shall be installed with their lines parallel and perpendicular to the building line and properly aligned with the ceiling.
- B. Ceiling mounted Exhaust and Return Registers/Grilles: Mount as specified hereinbefore for surface mounted ceiling diffusers except use finished screws provided and secure to duct and finished ceiling (or finished ceiling for nonducted returns) in accordance with the manufacturer's instructions. Where required to provide adequate support for nonducted registers or grilles, provide appropriate mounting frame for incorporation into the ceiling system.
- C. Install all outlets and inlets as recommended by the manufacturer; in accordance with recognized industry practices; to insure that products serve intended functions.
- D. Locate ceiling air outlets and inlets as indicated on the drawings. Unless otherwise indicated, locate units in center of acoustical ceiling modules. Install square and parallel with partitions, ceiling grid members, etc.
- E. Spare Parts: Furnish to Owner, with receipt, 3 operating keys for each type of outlet and inlet that require them.

- F. Do not install blank-offs under continuous linear diffuser distribution plenums. Distribution plenums shall cover only active portion of the diffuser.

3.3 PROTECTION OF WORK UNTIL FINAL ACCEPTANCE

- A. Coordinate the installation of the air distribution equipment with related work and finishing of adjacent surfaces to prevent damage to the devices or adjacent finishes. Protect the finish of all air distribution equipment until final acceptance. Replace or repair to the Architect's satisfaction any damaged equipment.

END OF SECTION 15936

SECTION 15981 - PERFORMANCE VERIFICATION, FINAL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SCOPE

- A. Provide the services of an independent test and balance agency to verify the performance of the complete heating, ventilating and air conditioning systems as described by Division 15. Performance verification shall be accomplished by established testing and balancing procedures as described in this section.

1.3 RELATION TO OTHER WORK

- A. Refer to the section, "General Mechanical Provisions", for related requirements. Refer to other sections of Division 15 and to all other applicable portions of the Drawings and Specifications.

1.4 TEST AND BALANCE AGENCY

- A. All performance verification shall be performed by an independent test and balance agency (herein referred to as the "T & B Agency") which is fully certified by and a current member of the Associated Air Balance Council (AABC).

1.5 CONTRACTUAL RELATIONSHIP

- A. Performance verification shall be performed as a service of the T & B Agency directly to the Contractor with no other subcontractors as part of the agreement.
- B. Performance verification is specified in this Division 15 only because it relates predominantly to Division 15 work. However, the inclusion in this Division 15 of this section covering performance verification shall not preclude the contractual agreement of the T & B Agency from contracting directly to the Contractor with no other subcontractors as part of such agreement.

1.6 AGENCY APPROVAL

- A. Submit the name and qualifications of the proposed T & B Agency to the Architect/Engineer for approval within thirty (30) days of Notice to Proceed.
- B. Include AABC National Project Certification Performance Guaranty.

1.7 WORK INCLUDED

- A. The T & B Agency shall provide all labor, supervision, professional services, tools, test equipment and instruments (except as otherwise specified) to perform the following work and all other work of this section:
1. Review the automatic temperature control for effects on the testing and balancing procedures for the air systems.
 2. Where in the opinion of the T & B Agency conditions may exist in the system design or construction that may have the potential of adversely affecting system performance, then the T & B Agency shall identify the condition and submit in writing recommended correctives for consideration by the Architect/Engineer.
 3. During construction, review those shop drawings which have relevance to performance verification to confirm that the required, ductwork and equipment, and their respective specialties and accessories such as gauges, dampers, access doors, etc., are properly selected, sized and located to permit proper and complete testing and balancing to be accomplished.
 4. Perform site inspections to verify compliance with documents, and observe pressure tests on ductwork.
 5. Perform a complete air test and balance of all heating, ventilating, air conditioning and exhaust air systems shown and described on the Construction Documents and as further described herein.
 6. Submit Equipment Test and Systems Balance Report.
 7. Furnish specifications to Contractor for properly sized fixed sheaves on fan systems after proper RPM has been established.

1.8 GUARANTY

- A. The T & B Agency shall include a warranty period of ninety (90) days after completion and acceptance of test and balance work. During the warranty period, the Architect/Engineer may request a re-check or re-setting of any system component requiring testing and balancing. The T & B Agency shall provide technicians, instruments, and tools to assist the Architect/Engineer in conducting any test that he may require during this time. The foregoing shall be in addition to the A.A.B.C. National Project Certification Performance Guaranty which shall also be provided.

PART 2 - PRODUCTS

2.1 GENERAL

- A. The tangible product of this section shall include the reports and documentation necessary to verify the systems' performance.

2.2 REPORT

- A. The T & B Agency shall in the course of his work record the information herein specified. Recorded test data shall be at the final balanced condition for each system. Recorded data shall be arranged by system using the appropriate designation as established on the Construction Documents. Four (4) copies of the final report signed, bound and indexed shall be submitted to the Architect/Engineer for his approval or comments.
- B. Where actual measurements recorded for the final balance show deviations of more than 10% from the design, the T & B Agency shall note same in the report and submit recommendations for corrective action to the Architect/Engineer for his consideration.
- C. In those cases where recorded data can be reasonably interpreted to be inaccurate, inconsistent and/or erroneous, the Architect/Engineer may request additional testing and balancing. The T & B Agency shall at no additional cost perform such retesting and rebalancing as directed by and in the presence of the Architect/Engineer.
- D. Where, in the opinion of the T & B Agency, there is excessive vibration, movement or noise from any piece of equipment, ductwork, pipes, etc., the T & B Agency shall note same in the report and submit recommendations for action to the Architect/Engineer.
- E. The T & B Agency shall verify that each thermostat and the devices it is controlling, such as control valves, motorized dampers, etc., operate in the exact sequence required.
- F. Test Data: Include the following data in the Systems Test and Balance Report:
 - 1. Motors:
 - Manufacturer
 - Model and serial number
 - Rated amperage and voltage
 - Rated horsepower
 - Rated RPM
 - Corrected full load amperage
 - Measured amperage and voltage
 - Calculated BHP
 - Measured RPM
 - Sheave size, type and manufacturer

2. Fans:

Manufacturer

Model or Serial number, BI or Air Foil - number of blades

Rated CFM, measured CFM

Rated RPM, measured RPM

Measured pressures - Inlet and Outlet Static Pressure

Pulley size, type and manufacturer

Belt size and quantity

Rated TSP

Operating TSP & operating ESP (at discharge side of
Supply Fan or suction side of Exhaust/Return Fan)

3. Air Systems (including inlets and outlets):

Provide single line diagrammatic plan locating each air inlet and outlet and its reference number.

Grille or diffuser reference number and manufacturer.

Grille or diffuser location.

Design velocity.

Design CFM.

Effective area factor and size.

Measured velocity.

Measured CFM

G. Other Report Requirements: Where any systems have equipment or components which are not covered by the above, then the Final Test and Balance Report shall include the following data as applicable to such equipment or systems to confirm actual operation:

1. All inlet and outlet areas.
2. All applicable duct, pipe and coil sizes.
3. Outside, inside, mixed and supply air conditions.
4. All fluid velocities, flow rates, temperatures and pressures at appropriate locations.
5. All speeds.
6. All voltage and ampere ranges.
7. Descriptions of each test method used.

2.3 INSTRUMENTATION

- A. All test and balance equipment and instruments to be furnished by the T & B Agency shall have been calibrated within six (6) months of use on this work. A list of equipment and instruments to be used shall be submitted to the Architect/Engineer prior to commencing test and balancing operations and shall include equipment and/or instruments, name, manufacturer, serial number and certification of last calibration date. Instruments without calibration adjustment capability shall be accompanied with manufacturer's certification of accuracy. Test and balance equipment and instruments furnished by the Contractor to the T & B Agency shall be accompanied with certification as required above. The T & B Agency shall be responsible for the protection from damage due to accident, abuse or misuse, all equipment and instruments provided by the Contractor, and shall return same in good working condition at the completion of the test and balance work to the Contractor. The T & B Agency shall repair at his expense to original condition and accuracy or replace with like equipment and instruments damaged in the work.

2.4 DIAGRAMS

- A. Provide a schematic diagram (i.e., one-line) of duct system(s) tested. Indicate on the diagram the relative location of all air distribution devices, heating/cooling coils, points of data measurements (i.e., pitot traverse, temperature, static pressure) fans, air handling units, and similar equipment included in the system. Diagram shall identify each component tested. Said identification shall utilize the conventions shown on the drawings (i.e., AHU-1 or EF-6) and correlate with the data sheets provided in the Test and Balance Report.

2.5 LOGS AND FORMS

- A. Logs and forms shall clearly indicate following:
 - 1. All inlet and outlet areas.
 - 2. All applicable duct, pipe and coil sizes.
 - 3. Outside, inside, mixed and supply air conditions.
 - 4. All fluid velocities, flow rates, temperatures and pressures at significant locations (e.g., fluid pressures before and after each fan, etc.).
 - 5. All fan speeds.
 - 6. All motor ampere ranges.
 - 7. Descriptions of each test method used.
- B. Associated Air Balance Council log and data forms.

PART 3 - EXECUTION

3.1 GENERAL

- A. **Sheaves:** The Contractor shall provide applicable fans with V-belt drives and fixed pitch sheaves. In order to provide the properly sized fixed pitch sheave, the Contractor shall initially provide fans with V-belt drives, variable pitch sheaves. The Contractor, upon completion of system balancing by the T & B Agency, will replace these adjustable pitch sheaves with fixed sheaves of the size and type specified by the T & B Agency. The Contractor shall tag the adjustable sheaves, transmit same to Owner, and receive written receipt by Owner of acceptance of these sheaves.
- B. **Load Conditions:** All testing and balancing of systems shall be undertaken with maximum attainable load. Testing and balancing of all air handling systems shall be accomplished with ceiling tile in place and enclosing partitions and doors erected.
- C. **Observe all equipment and exposed piping for noise, movement or vibrations under normal operating conditions and report excesses to the Architect and Owner.**

3.2 PERFORMANCE VERIFICATION, PRELIMINARY

- A. The Contractor, prior to commencement of the balancing by the T & B Agency, shall verify in writing:
 - 1. That all air filters have been installed and are in clean condition.
 - 2. That all linkages between valves or dampers and their actuators are secure.
- B. The Contractor shall confirm in writing that the systems as scheduled for balancing, are operational and complete and that ductwork has been pressure tested and accepted and all affected systems have been cleaned.

3.3 PROTECTION OF WORK

- A. The Contractor shall protect all mechanical devices during the testing and balancing period. The activities of the T & B Agency will include but not be limited to the adjustments of designated balancing devices including; adjustment of balancing dampers, adjustment of air extractors, air splitters, or manual dampers, the adjustment of adjustable sheaves for fan speed, the adjustment of balancing valves, or similar devices. The existence of the T & B Agency shall not relieve the Contractor of his responsibility for the complete operation of the mechanical systems in conformance with the contract documents.

3.4 CORRECTION OF WORK

- A. The Contractor shall at no additional cost to the Owner rectify discrepancies between the actual installation and contract documents when in the opinion of the T & B Agency the discrepancy will significantly affect system balance and performance.

3.5 COORDINATION AND ASSISTANCE

- A. The Contractor shall assist the T & B Agency by providing all labor, equipment, tools and material required to operate all of the equipment and systems necessary for the testing and balancing of the systems and for the adjustment, calibration or repair of all electric or pneumatic or automated control devices and components. These services shall be available on each working day during the period of final testing and balancing. The Contractor shall assist the T & B Agency by arranging to have all ceilings, partitions, windows, and doors installed prior to the scheduled commencement of balancing within each specified area.
- B. The Contractor shall provide to the approved T & B Agency a complete set of plans and specifications and an approved copy of all heating, ventilating and air conditioning equipment shop drawings. The Contractor shall include the cost of all pulley, belt, and drive changes, as well as balancing dampers required to achieve proper system balance recommended by the T & B Agency.

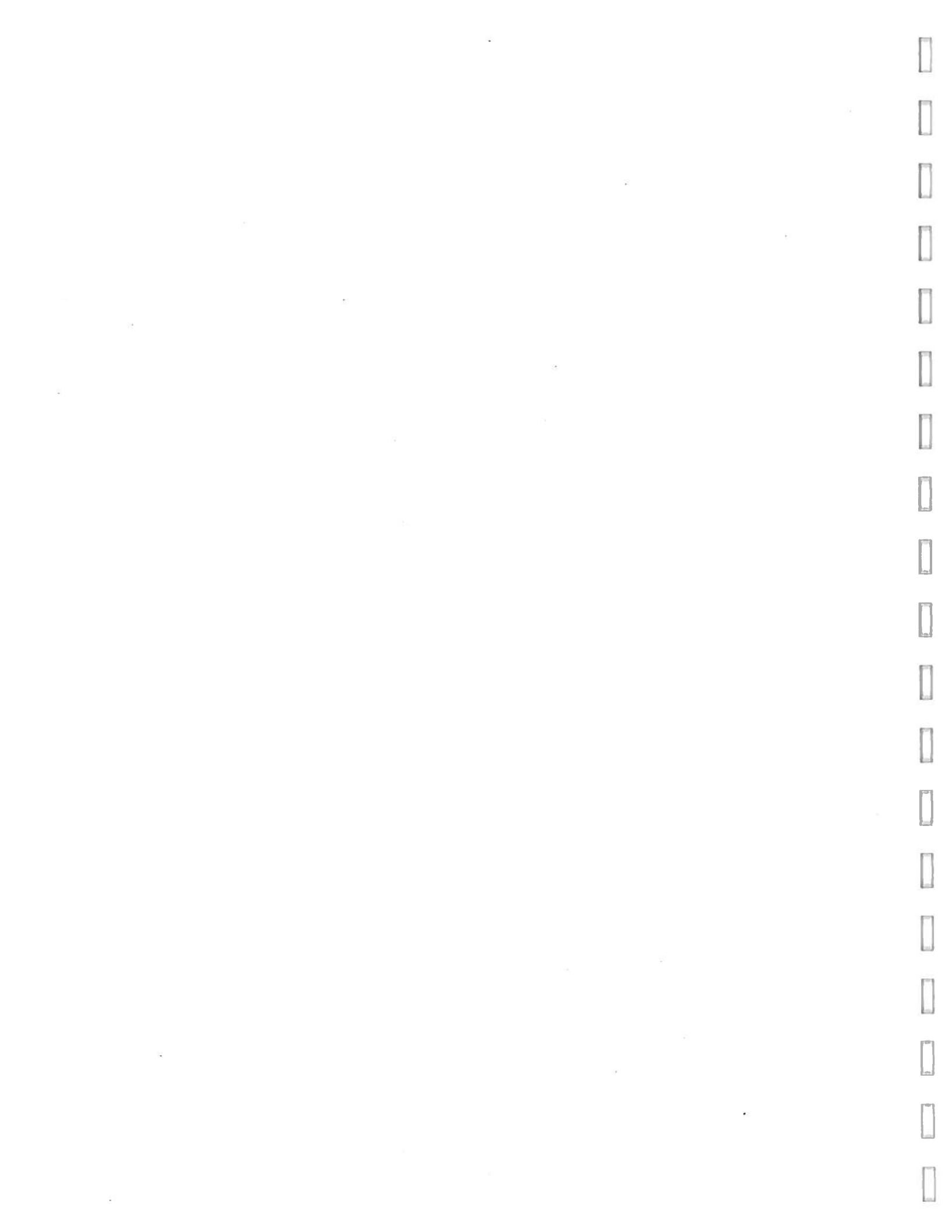
3.6 AIR SYSTEMS

- A. The testing and balancing shall include, but is not limited to, the following requirements:
 - 1. Adjust fan speeds to deliver the required cfm and static pressure, and record rpm and full load amperes.
 - 2. Make pitot tube traverse of main supply ducts to verify design cfm. Seal duct access holes with rubber or metal snap-in plugs.
 - 3. For each supply air system, verify the quantity of outside air and return air when the system is operating in the maximum cooling and full heating modes.
 - 4. Test and adjust each diffuser, grille and register to within 10% of design requirements, and also adjust so as to minimize drafts in all areas.
 - 5. Observe all equipment and exposed ductwork for noise, movement or vibration under normal operating conditions and report excesses to the Architect/Engineer.
- B. After all air distribution devices have been balanced to distribute calculated design indicated air quantities and if temperature in any area (where such area does not have the particular zone temperature control thermostat located therein) of any zone is not maintained within 2 degrees plus or minus of the zone areas which does have the zone temperature control thermostat, then notify Architect/Engineer of such conditions and obtain approval to rebalance devices to obtain air quantities other than those indicated so that air temperature in entire zone will be as even as possible regardless of calculated design air quantities. After obtaining approval to rebalance, perform such necessary rebalancing.

END OF SECTION 15981

DIVISION 16 ELECTRICAL

SECTION	16010	BASIC ELECTRICAL REQUIREMENTS	1 THRU 5
SECTION	16050	BASIC MATERIALS AND METHODS	1 THRU 30
SECTION	16060	GROUNDING AND BONDING	1 THRU 5
SECTION	16073	HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS	1 THRU 5
SECTION	16211	ELECTRIC METERING	1 THRU 2
SECTION	16511	INTERIOR LIGHTING	1 THRU 6
SECTION	16740	TELEPHONE, DATA, TV, AND SECURITY CONDUITE SYSTEMS	1 THRU 3



SECTION 16010 - BASIC ELECTRICAL REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division-1 Specification Sections, apply to work of this Section.
- B. Coordination of work between mechanical and electrical trades is covered in Division-15 Section "GENERAL MECHANICAL PROVISIONS".

1.2 SUMMARY

- A. This Section specifies the basic requirements for electrical installations and includes requirements common to all sections of Division-16. It expands and supplements the requirements specified in sections of Division-1.

1.3 CODES AND STANDARDS

- A. Install all work in accordance with the applicable requirements of the latest edition of the following:
 - 1. National Electric Code (NEC)
 - 2. Local, State, County and City Codes
 - 3. National Fire Protection Association (NFPA)
 - 4. American National Standards Institute (ANSI)
 - 5. NEMA Standards
- B. It is the intent of the Contract Documents to comply with the applicable codes, ordinances, regulations, and standards. Where discrepancies occur, notify the Architect in writing, and ask for interpretation. Correct any installation that fails to comply with the applicable codes and standards at no additional cost to the Owner.
- C. All materials shall be new and free of defects, and shall be U.L. listed, bear the U.L. label or be labeled or listed with an approved, nationally recognized Electrical Testing Agency. Where no labeling or listing service is available for certain types of equipment, test data shall be submitted to prove to the Engineer and Authority Having Jurisdiction that equipment meets or exceeds available standards.

1.4 PERMITS AND INSPECTIONS

- A. Obtain and make all payments for permits and inspections required. At the completion of the project and before final acceptance of the electrical work, provide evidence of final inspection and approval by the authorities having jurisdiction.

1.5 QUALITY ASSURANCE

- A. **Manufacturers:** Firms regularly engaged in manufacture of electrical products specified, whose products have been in satisfactory use in similar service for not less than 5 years.
- B. **Installer's Qualifications:** Firm with at least 5 years of successful installation experience on projects with electrical work similar to that required for this project.

1.6 IDENTIFICATION

- A. The following items shall be equipped with nameplates: All motors, motor starters, motor-control centers, pushbutton stations, control panels, time switches, disconnect switches, panelboards, circuit breakers, contactors.
- B. Nameplates shall adequately describe the function of the particular equipment involved. Nameplates for panelboards and switchboards shall include the panel designation, branch (normal or emergency), voltage and phase of the supply. For example, "Panel A, Emergency Branch, 120Y/208V, 3-phase, 4-wire."
- C. Nameplates shall be laminated phenolic plastic, black front and back with white core, with 3/8" high lettering etched through the outer covering. White engraved letters on black background. Attach with plated self-tapping screws or brass bolts.
- D. All junction box covers shall be hand marked with a 1/8" wide permanent black marking pen, indicating panel and circuit numbers contained, or system contained, i.e., fire alarm, telephone, etc.

1.7 ROUGH-IN

- A. Verify final locations for rough-ins with field measurements and with the requirements of the actual equipment to be connected, and architectural room elevations.

1.8 ELECTRICAL INSTALLATIONS

- A. Coordinate electrical equipment and materials installation with other building components.
- B. Verify all dimensions by field measurements.
- C. Arrange for chases, slots, and openings in other building components to allow for electrical installations.
- D. Coordinate the installation of required supporting devices and sleeves to be set in poured in place concrete and other structural components, as they are constructed.
- E. Sequence, coordinate, and integrate installations of electrical materials and equipment for efficient flow of the Work. Give particular attention to large equipment requiring positioning prior to closing-in the building.

- F. Coordinate the cutting and patching of building components to accommodate the installation of electrical equipment and materials.
- G. Coordinate connection of electrical systems with local utility services. Comply with requirements of governing regulations, franchised service companies, and controlling agencies. Provide required connections for each service.

1.9 CUTTING AND PATCHING

- A. This Article specifies the cutting and patching of electrical equipment, components, and materials to include removal and legal disposal of selected materials, components, and equipment.
- B. Do not endanger or damage installed Work through procedures and processes of cutting and patching.
- C. Arrange for repairs required to restore other work, because of damage caused as a result of electrical installations.
- D. No additional compensation will be authorized for cutting and patching Work that is necessitated by ill-timed, defective, or non-conforming installations.
- E. Perform cutting, fitting, and patching of electrical equipment and materials required to:
 - 1. Uncover Work to provide for installation of ill-timed work;
 - 2. Remove and replace defective Work;
 - 3. Remove and replace Work not conforming to requirements of the Contract Documents;
 - 4. Remove samples of installed Work as specified for testing;
 - 5. Upon written instructions from the Architect/Engineer, uncover and restore Work to provide for Architect/Engineer observation of concealed Work.
 - 6. Install electrical work in existing facilities.

1.10 ELECTRICAL SUBMITTALS

- A. Refer to the Conditions of the Contract (General and Supplementary) and Division-1 Section: SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES for submittal definitions, requirements, and procedures.
- B. Submittal of shop drawings, product data, and samples will be accepted only when submitted by the Contractor. Data submitted from subcontractors and material suppliers directly to the Architect/Engineer will not be processed.

1.11 PRODUCT OPTIONS AND SUBSTITUTIONS

- A. Refer to the Instructions to Bidders and the Division-1 for requirements in selecting products and requesting substitutions. Where a listing of acceptable manufacturers has been given, use one of those manufacturers given only.

1.12 PRODUCT LISTING

- A. Prepare listing of major electrical equipment and materials for the project.
- B. Provide all information requested.
- C. Submit this listing as a part of the submittal requirement specified in Division-1.
- D. When two or more items of the same material or equipment are required they shall be of the same manufacturer, i.e., panelboards, motor starters, transformers, etc. Product manufacturer uniformity does not apply to raw materials, bulk materials, wire, conduit, fittings, sheet metal, steel bar stock, welding rods, solder, fasteners, motors for dissimilar equipment units, and similar items used in Work, except as otherwise indicated.
- E. Provide products which are compatible within systems and other connected items.

1.13 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to project properly identified with names, model numbers, types, grades, compliance labels, and similar information needed for distinct identifications; adequately packaged and protected to prevent damage during shipment, storage, and handling.
- B. Store equipment and materials at the site, unless off-site storage is authorized in writing. Protect stored equipment and materials from damage.
- C. Coordinate deliveries of electrical materials and equipment to minimize construction site congestion. Limit each shipment of materials and equipment to the items and quantities needed for the smooth and efficient flow of installations.

1.14 RECORD DOCUMENTS

- A. Refer to the Division-1 Section: PROJECT CLOSEOUT or PROJECT RECORD DOCUMENTS for requirements. The following paragraphs supplement the requirements of Division-1.
- B. Mark Drawings to indicate revisions to conduit size and location both exterior and interior; actual equipment locations, distribution and branch electrical circuitry; fuse and circuit breaker size and arrangements; support and hanger details.
- C. Mark Specifications to indicate approved substitutions; Change Orders; actual equipment and materials used.

1.15 OPERATION AND MAINTENANCE DATA

- A. Refer to the Division-1 Section; PROJECT CLOSEOUT or OPERATION AND MAINTENANCE DATA for procedures and requirements for preparation and submittal of maintenance manuals.

1.16 WARRANTIES

- A. Refer to individual equipment specifications for warranty requirements.
- B. Compile and assemble the warranties specified in Division-16, into a separate set of vinyl covered, three ring binders, tabulated and indexed for easy reference.
- C. Provide complete warranty information for each item to include product or equipment, date of beginning of warranty or bond; duration of warranty or bond; and names, addresses, and telephone numbers and procedures for filing a claim and obtaining warranty services.

1.17 CLEANING

- A. Refer to the Division-1 Section; PROJECT CLOSEOUT or FINAL CLEANING for general requirements for final cleaning.
- B. Clean all light fixtures, lamps and lenses prior to final acceptance. Replace all inoperative lamps.

1.18 TEMPORARY POWER

- A. Provide and pay for all temporary electrical service as required for construction.
- B. Provide all temporary lighting and power distribution as required for construction. All temporary electrical work shall be in accordance with the N.E.C.

1.19 ELECTRONIC FILES

- A. CADD files will be available on a limited basis to qualified firms at the Architects prerogative. The cost of the files will be \$100 per sheet. Recipients are cautioned that these files may not accurately show actual conditions as constructed. Users are responsible to verify actual field conditions. These files are not intended to be used as shop drawings.
 - 1. A request for CADD files should be delivered in writing along with payment for such files. Files will not be processed until payment is received.

END OF SECTION 16010



SECTION 16050 - BASIC ELECTRICAL MATERIALS AND METHODS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Electrical equipment coordination and installation.
2. Sleeves for raceways and cables.
3. Sleeve seals.
4. Common electrical installation requirements.
5. Building conduits and raceways
6. Building wires and cables rated 600 V and less.
7. Connectors, splices, and terminations rated 600 V and less.
8. Receptacles, receptacles with integral GFCI, and associated device plates.
9. Snap switches and wall-box dimmers.
10. Communications outlets
11. Time switches.
12. Outdoor photoelectric switches.
13. Lighting contactors.
14. Emergency shunt relay.
15. TVSSs for low-voltage power equipment.
16. Fusible switches.
17. Nonfusible switches.
18. Molded-case circuit breakers.
19. Enclosures.
20. AC, enclosed controllers rated 600 V and less.
21. Cartridge fuses rated 600 V and less for use in switches and controllers.
 - a. Across-the-line, manual and magnetic controllers.
22. Distribution panelboards and lighting and appliance branch-circuit panelboards.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Field quality-control test reports.
- C. Shop Drawings:
1. For custom enclosures and cabinets. Include plans, elevations, sections, details, and attachments to other work.
 2. List of legends and description of materials and process used for premarking wall plates.

3. Surge Suppression Devices (TVSS): Include rated capacities, operating weights, operating characteristics, furnished specialties, and accessories
4. For each type of panelboard, overcurrent protective device, accessory, and component indicated. Include dimensions and manufacturers' technical data on features, performance, electrical characteristics, ratings, and finishes.
 - a. Enclosure types and details for types other than NEMA 250, Type 1.
 - b. Bus configuration, current, and voltage ratings.
 - c. Short-circuit current rating of panelboards and overcurrent protective devices.
 - d. Features, characteristics, ratings, and factory settings of individual overcurrent protective devices and auxiliary components.
 - e. Wiring Diagrams: Power, signal, and control wiring.
5. Field quality-control test reports.
6. Operation and maintenance data.

- D. Operation and Maintenance Data: For wiring devices to include in all manufacturers' packing label warnings and instruction manuals that include labeling conditions.

1.3 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Test Equipment Suitability and Calibration: Comply with NETA ATS, "Suitability of Test Equipment" and "Test Instrument Calibration."
- C. Source Limitations: Obtain suppression devices and accessories through one source from a single manufacturer.
 1. Comply with IEEE C62.41, "IEEE Guide for Surge Voltages in Low Voltage AC Power Circuits," and test devices according to IEEE C62.45, "IEEE Guide on Surge Testing for Equipment Connected to Low-Voltage AC Power Circuits."
 2. Comply with NEMA LS 1, "Low Voltage Surge Protection Devices."
 3. Comply with UL 1283, "Electromagnetic Interference Filters," and UL 1449, "Transient Voltage Surge Suppressors."
- D. Product Data: For each type of panelboard, overcurrent protective device, accessory, and
- E. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- F. Panelboards shall comply with NEMA PB 1.

G. Comply with NEMA FU 1.

H. Comply with NFPA 70.

1.4 PROJECT CONDITIONS

A. Service Conditions: Rate surge protection devices for continuous operation under the following conditions, unless otherwise indicated:

1. Maximum Continuous Operating Voltage: Not less than 115 percent of nominal system operating voltage.
2. Operating Temperature: 30 to 120 deg F.
3. Humidity: 0 to 85 percent, noncondensing.
4. Altitude: Less than 20,000 feet above sea level.

1.5 COORDINATION

A. Coordinate arrangement, mounting, and support of electrical equipment:

1. To allow maximum possible headroom unless specific mounting heights that reduce headroom are indicated.
2. To provide for ease of disconnecting the equipment with minimum interference to other installations.
3. To allow right of way for piping and conduit installed at required slope.
4. So connecting raceways, cables, wireways, cable trays, and busways will be clear of obstructions and of the working and access space of other equipment.

B. Coordinate installation of required supporting devices and set sleeves in cast-in-place concrete, masonry walls, and other structural components as they are constructed.

C. Coordinate location of access panels and doors for electrical items that are behind finished surfaces or otherwise concealed. Access doors and panels are specified in Division 8 Section "Access Doors and Frames."

D. Coordinate electrical testing of electrical, mechanical, and architectural items, so equipment and systems that are functionally interdependent are tested to demonstrate successful interoperability.

E. Coordinate features of enclosed controllers and accessory devices with pilot devices and control circuits to which they connect.

F. Coordinate features, accessories, and functions of each enclosed controller with ratings and characteristics of supply circuit, motor, required control sequence, and duty cycle of motor and load.

PART 2 - PRODUCTS

2.1 METAL CONDUIT AND TUBING

- A. Rigid Steel Conduit: ANSI C80.1.
- B. IMC: ANSI C80.6.
- C. EMT: ANSI C80.3.
- D. FMC: Zinc-coated steel.
- E. LFMC: Flexible steel conduit with PVC jacket.
- F. Fittings for Conduit (Including all Types and Flexible and Liquidtight), EMT, and Cable: NEMA FB 1; listed for type and size raceway with which used, and for application and environment in which installed.
 - 1. Conduit Fittings RMC & IMC: Pipe threaded, cast ferrous metal.
 - 2. Fittings for EMT: Steel set-screw or compression type.

2.2 NONMETALLIC CONDUIT AND TUBING

- A. RNC: NEMA TC 2, Type EPC-40-PVC, unless otherwise indicated.
- B. Fittings for ENT and RNC: NEMA TC 3; match to conduit or tubing type and material..

2.3 METAL WIREWAYS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Cooper B-Line, Inc.
 - 2. Hoffman.
 - 3. Square D; Schneider Electric.
- B. Description: Sheet metal sized and shaped as indicated, NEMA 250, Type 3R, unless otherwise indicated.
- C. Fittings and Accessories: Include couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings to match and mate with wireways as required for complete system.
- D. Wireway Covers: Screw-cover type, as indicated.
- E. Finish: Manufacturer's standard enamel finish.

2.4 BOXES, ENCLOSURES, AND CABINETS

- A. Sheet Metal Outlet and Device Boxes: NEMA OS 1.
- B. Cast-Metal Outlet and Device Boxes: NEMA FB 1, aluminum, Type FD, with gasketed cover.
- C. Metal Floor Boxes: Sheet metal fully adjustable, rectangular.
- D. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.
- E. Hinged-Cover Enclosures: NEMA 250, Type 1, with continuous-hinge cover with flush latch, unless otherwise indicated.
 - 1. Metal Enclosures: Steel, finished inside and out with manufacturer's standard enamel.
- F. Cabinets:
 - 1. NEMA 250, Type 1, galvanized-steel box with removable interior panel and removable front, finished inside and out with manufacturer's standard enamel.
 - 2. Hinged door in front cover with flush latch and concealed hinge.
 - 3. Key latch to match panelboards.
 - 4. Metal barriers to separate wiring of different systems and voltage.
 - 5. Accessory feet where required for freestanding equipment.

2.5 CONDUCTORS AND CABLES

- A. Copper Conductors: Comply with NEMA WC 70.
- B. Conductor Insulation: Comply with NEMA WC 70 for Types THW, THHN-THWN, XHHW and SO.
- C. Multiconductor Cable: Comply with NEMA WC 70 for metal-clad cable, Type MC Type SO with ground wire.

2.6 CONNECTORS AND SPLICES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. AFC Cable Systems, Inc.
 - 2. Hubbell Power Systems, Inc.
 - 3. O-Z/Gedney; EGS Electrical Group LLC.
 - 4. 3M; Electrical Products Division.
 - 5. Tyco Electronics Corp.
- B. Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated.

2.7 SLEEVES FOR CABLES

- A. Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, galvanized steel, plain ends.
- B. Coordinate sleeve selection and application with selection and application of firestopping specified in Division 7 Section "Through-Penetration Firestop Systems."

2.8 WIRING DEVICES

A. Manufacturers:

- 1. Manufacturers' Names: Shortened versions (shown in parentheses) of the following manufacturers' names are used in other Part 2 articles:
 - a. Cooper Wiring Devices; a division of Cooper Industries, Inc. (Cooper).
 - b. Hubbell Incorporated; Wiring Device-Kellems (Hubbell)..
 - c. Pass & Seymour/Legrand; Wiring Devices & Accessories (Pass & Seymour).

B. Straight Blade Receptacles:

- 1. Convenience Receptacles, 125 V, 20 A: Comply with NEMA WD 1, NEMA WD 6 configuration 5-20R, and UL 498. Smooth faced decorator style face, heavy-duty specification grade devices, side and back wired.
- 2. Products: Subject to compliance with requirements, provide one of the following:
 - 1) Cooper; 5361 (single), 5362 (duplex)
 - 2) Hubbell; HBL5351 (single), HBL2152(duplex).
 - 3) Pass & Seymour; 26251 (single), 26252 (duplex).

C. GFCI Receptacles:

- 1. General Description: Straight blade, feed-through type. Comply with NEMA WD 1, NEMA WD 6, UL 498, and UL 943, Class A, and include indicator light that is lighted when device is tripped.
- 2. Duplex GFCI Convenience Receptacles, 125 V, 20 A:
- 3. Products: Subject to compliance with requirements, provide one of the following:
 - a. Cooper;XHGF20
 - b. Pass & Seymour; 2094.

D. Isolated-Ground, Duplex Convenience Receptacles, 125 V, 20 A:

- 1. Comply with NEMA WD 1, NEMA WD 6 configuration 5-20R, and UL 498.
- 2. Description: Straight blade; equipment grounding contacts shall be connected only to the green grounding screw terminal of the device and with inherent electrical isolation from

mounting strap. Isolation shall be integral to receptacle construction and not dependent on removable parts.

3. Products: Subject to compliance with requirements, provide one of the following:
 - a. Hubbell; CR 5253IG.
 - b. Leviton; 5362-IG.
 - c. Pass & Seymour; IG6300.
- E. Special Purpose Convenience Outlets; 125, or 250V; NEMA Configuration, Ampere Rating, & Voltage as indicated on Plans.
1. Comply with NEMA WD 1, NEMA WD 6 configuration as indicated on Plans, and with UL 498.
 2. Description: Straight blade; dead front nylon face and reinforced thermoplastic polyester body, side and back wired, equipment grounding contacts shall be connected only to the green grounding screw terminal of the device, strap mounting in standard two-gang outlet boxes.
 3. Provide complete with matching plug, cord grip, and Type SO cord.
 4. Products: Subject to compliance with requirements, provide one of the following:
 - a. Hubbell;
 - b. Leviton;
 - c. Pass & Seymour;
- F. Special Purpose Locking Convenience Outlets; 125, or 250V; NEMA Configuration, Ampere Rating, & Voltage as indicated on Plans.
1. Comply with NEMA WD 1, NEMA WD 6 configuration as indicated on Plans, and with UL 498.
 2. Description: Straight blade, locking; dead front nylon face, side and back wired, equipment grounding contacts shall be connected only to the green grounding screw terminal of the device.
 3. Provide complete with matching plug, cord grip, and Type SO cord.
 4. Products: Subject to compliance with requirements, provide one of the following:
 - a. Hubbell; "Twist-Lock"
 - b. Leviton; "Industrial Locking".
 - c. Pass & Seymour; "Turn-Lock"
- G. Snap Switches:
1. Comply with NEMA WD 1 and UL 20.
 2. Switches, 120/277 V, 20 A:
 3. Products: Subject to compliance with requirements, provide one of the following:
 - a. Cooper; DECB120 (single pole),DECB220 (two pole),DECB320 (three way), DECB420 (four way).

- b. Hubbell; HBL1281 (single pole), HBL1282 (two pole), HBL1283 (three way), HBL1284(four way).
- c. Pass & Seymour; 2621-*(single pole), 2622-*(two pole), 2623-*(three way), 2624-*(four way).

H. Pilot Light Switches, 20 A:

- 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Cooper; 6631* for 120 V and 277 V.
 - b. Hubbell; HBL2121 - * for 120 V and 277 V.
 - c. Pass & Seymour; 2629-* for 120 V.
- 2. Description: Single pole, specification grade, decorator style, illuminated when switch is "ON.", side & back wired

I. Single-Pole, Double-Throw, Momentary Contact, Center-Off Switches, 120/277 V, 20 A; for use with mechanically held lighting contactors.

- 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Cooper; 1995.
 - b. Hubbell; HBL1557*.
 - c. Pass & Seymour; 1251.

J. Single-Pole, Double-Throw, Maintained Contact, Center-Off Switches, 120/277 V, 20 A; for use with message signs.

- 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Cooper; 2225V
 - b. Hubbell; HBL1381*
 - c. Pass & Seymour; 1221-*

K. Wall-box Dimmers:

- 1. Dimmer Switches: Modular, full-wave, solid-state units with integral, quiet on-off switches, with audible frequency and EMI/RFI suppression filters.
- 2. Control: Continuously adjustable slider; with single-pole or three-way switching. Comply with UL 1472.
- 3. Incandescent Lamp Dimmers: 120 V; control shall follow square-law dimming curve. On-off switch positions shall bypass dimmer module.
- 4. 600 W; dimmers shall require no derating when ganged with other devices
- 5. 1000 W; dimmers shall require no derating when ganged with other devices.
- 6. 1500 W; dimmers shall require no derating when ganged with other devices.

L. Fluorescent Lamp Dimmer Switches: Modular; compatible with dimmer ballasts; trim potentiometer to adjust low-end dimming; dimmer-ballast combination capable of consistent dimming with low end not greater than 5 percent of full brightness.

M. Communications Outlets:

1. Telephone Outlet:

a. Products: Subject to compliance with requirements, provide one of the following:

- 1) Cooper; 3560-6.
- 2) Leviton; 40649.
- 3) Pass & Seymour; C5EF-*

b. Description: Single RJ-45 jack for terminating 100-ohm, balanced, four-pair UTP; TIA/EIA-568-B.1 complying with Category 5e. Comply with UL 1863.

N. Wall Plates:

1. Single and combination types decorator style to match corresponding wiring devices:

- a. Plate-Securing Screws: Metal with head color to match plate finish.
- b. Material for Finished Spaces: Smooth, high-impact thermoplastic.
- c. Material for Unfinished Spaces: Galvanized steel
- d. Material for Damp Locations: Cast aluminum with spring-loaded lift cover, and listed and labeled for use in "wet locations."

2. Wet-Location, Weatherproof Cover Plates: NEMA 250, complying with type 3R weather-resistant[, die-cast aluminum with lockable cover.

2.9 FLOOR SERVICE FITTINGS

A. Type: Modular, flap-type, dual-service units suitable for wiring method used.

B. Compartments: Barrier separates power from voice and data communication cabling.

C. Service Plate: Rectangular, die-cast aluminum with satin finish and carpet recess in carpeted areas.

D. Power Receptacle: Two NEMA WD 6 configuration 5-20R, duplex gray finish, unless otherwise indicated.

E. Voice and Data Communication Outlet: Four modular, keyed, color-coded, RJ-45 Category 5e jacks for UTP cable.

F. Security Outlet: One hole cover for installation of security cables.

- G. Manufacturer: Wiremold RFB4 series with #S36CCTCAL or #S36DDTCAL cover, as required by floor finish.

2.10 FINISHES- WIRING DEVICES & PLATES

- A. Color: Wiring device catalog numbers in Section Text do not designate device color.
 - 1. Wiring Devices Connected to Normal Power System: White or As selected by Architect, unless otherwise indicated or required by NFPA 70 or device listing.
 - 2. Wiring Devices Connected to Emergency Power System: Red.
 - 3. TVSS Devices: Blue.

2.11 TIME SWITCHES

- A. Basis-of-Design Product: Subject to compliance with requirements, provide the product indicated on Drawings or a comparable product by one of the following:
 - 1. Paragon Electric Co.; Invensys Climate Controls.
 - 2. TORK.
- B. Electronic Time Switches: Electronic, solid-state programmable units with alphanumeric display; complying with UL 917.
 - 1. Contact Configuration: DPDT
 - 2. Contact Rating: 20-A ballast load, 120/240-V AC.
 - 3. Programs: Two channels; each channel shall be individually programmable with 8 on-off set points on a 24-hour schedule.
 - 4. Circuitry: Allow connection of a photoelectric relay as substitute for on-off function of a program on selected channels.
 - 5. Astronomic Time: Selected channels.
 - 6. Battery Backup: For schedules and time clock.

2.12 OUTDOOR PHOTOELECTRIC SWITCHES

- A. Basis-of-Design Product: Subject to compliance with requirements, provide the product indicated on Drawings or a comparable product by one of the following:
 - 1. Paragon Electric Co.; Invensys Climate Controls.
 - 2. TORK.
- B. Description: Solid state, with SPST dry contacts rated for 1800-VA tungsten or 1000-VA inductive, to operate connected relay, contactor coils, or microprocessor input; complying with UL 773A.
 - 1. Light-Level Monitoring Range: 1.5 to 10 fc, with an adjustment for turn-on and turn-off levels within that range and a directional lens in front of photocell to prevent fixed light sources from causing turn-off.

2. Time Delay: 15-second minimum, to prevent false operation.
3. Surge Protection: Metal-oxide varistor, complying with IEEE C62.41.1, IEEE C62.41.2, and IEEE 62.45 for Category A1 locations.

2.13 LIGHTING CONTACTORS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide the product indicated on Drawings or a comparable product by one of the following:
 1. Allen-Bradley/Rockwell Automation.
 2. Eaton Electrical Inc.; Cutler-Hammer Products.
 3. Square D; Schneider Electric.
- B. Description: Electrically operated and mechanically held, combination type with nonfused disconnect, complying with NEMA ICS 2 and UL 508.
 1. Current Rating for Switching: Listing or rating consistent with type of load served, including tungsten filament, inductive, and high-inrush ballast (ballast with 15 percent or less total harmonic distortion of normal load current).
 2. Fault Current Withstand Rating: Equal to or exceeding the available fault current at the point of installation.
 3. Enclosure: Comply with NEMA 250.
 4. Provide with control and pilot devices as indicated on Drawings, matching the NEMA type specified for the enclosure.

2.14 SURGE SUPPRESSORS (TVSS)

- A. Manufacturers:
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Advanced Protection Technologies, Inc.
 - b. Current Technology, Inc
 - c. LEA International.
- B. Service Entrance Suppressors:
 1. Surge Protection Device Description: Non-modular, sine-wave-tracking type with the following features and accessories:
 - a. LED indicator lights for power and protection status.
 - b. Audible alarm, with silencing switch, to indicate when protection has failed
 - c. Fuses, rated at 200-kA interrupting capacity.
 - d. Integral disconnect switch.
 - e. Redundant suppression circuits.
 - f. Surge-event operations counter.

2. Peak Single-Impulse Surge Current Rating: 240 kA per phase.
3. Connection Means: Permanently wired.
4. Protection modes and UL 1449 suppressed voltage rating for grounded wye circuits with voltages of 208Y/120, 3-phase, 4-wire circuits shall be as follows:
 - a. Line to Neutral: 400 V for 208Y/120.
 - b. Line to Ground: 400 V for 208Y/120.
 - c. Neutral to Ground: 400 V for 208Y/120.
5. Protection modes and UL 1449 suppressed voltage rating for 240/120-V, single-phase, 3-wire circuits shall be as follows:
 - a. Line to Neutral: 400 V.
 - b. Line to Ground: 400 V.
 - c. Neutral to Ground: 400 V.

C. Panelboard Suppressors:

1. Surge Protection Device Description: Non-modular, sine-wave-tracking type with the following features and accessories:
 - a. LED indicator lights for power and protection status.
 - b. Audible alarm, with silencing switch, to indicate when protection has failed.
 - c. Fuses, rated at 200-kA interrupting capacity.
 - d. Integral disconnect switch.
 - e. Redundant suppression circuits.
 - f. Surge-event operations counter.
2. Peak Single-Impulse Surge Current Rating: 120 kA per phase.
3. Protection modes and UL 1449 suppressed voltage rating for grounded wye circuits with voltages of 208Y/120, 3-phase, 4-wire circuits shall be as follows:
 - a. Line to Neutral: 400 V for 208Y/120.
 - b. Line to Ground: 400 V for 208Y/120.
 - c. Neutral to Ground: 400 V for 208Y/120.
4. Protection modes and UL 1449 suppressed voltage rating for 240/120-V, single-phase, 3-wire circuits shall be as follows:
 - a. Line to Neutral: 400 V.
 - b. Line to Ground: 400 V.
 - c. Neutral to Ground: 400 V.

D. Suppressors for Electronic-Grade Panelboards:

1. Surge Protection Device Description: Sine-wave-tracking type, panel-mounted design with the following features and accessories:

- a. LED indicator lights for power and protection status.
 - b. Audible alarm, with silencing switch, to indicate when protection has failed.
 - c. Arrangement with wire connections to phase buses, neutral bus, and ground bus.
- 2. Peak Single-Impulse Surge Current Rating: 120 kA per phase.
- 3. Protection modes and UL 1449 suppressed voltage rating for grounded wye circuits with voltages of 208Y/120, 3-phase, 4-wire circuits shall be as follows:
 - a. Line to Neutral: 400 V for 208Y/120.
 - b. Line to Ground: 400 V for 208Y/120.
 - c. Neutral to Ground: 400 V for 208Y/120.
- 4. Protection modes and UL 1449 suppressed voltage rating for 240/120-V, single-phase, 3-wire circuits shall be as follows:
 - a. Line to Neutral: 400 V.
 - b. Line to Ground: 400 V.
 - c. Neutral to Ground: 400 V.

2.15 FUSIBLE AND NONFUSIBLE SWITCHES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.
 - 1. Manufacturers:
 - a. Eaton Corporation; Cutler-Hammer Products.
 - b. General Electric Co.; Electrical Distribution & Control Division.
 - c. Square D/Group Schneider.
- B. Fusible Switch, 600 A and Smaller: NEMA KS 1, HD, with clips or bolt pads to accommodate specified fuses, lockable handle with capability to accept two padlocks, and interlocked with cover in closed position.
- C. Nonfusible Switch, 600 A and Smaller: NEMA KS 1, HD, lockable handle with capability to accept two padlocks, and interlocked with cover in closed position.
- D. Accessories:
 - 1. Equipment Ground Kit: Internally mounted and labeled for copper and aluminum ground conductors.
 - 2. Neutral Kit: Internally mounted; insulated, capable of being grounded, and bonded; and labeled for copper and aluminum neutral conductors.

2.16 MOLDED-CASE CIRCUIT BREAKERS AND SWITCHES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.
 - 1. Eaton Corporation; Cutler-Hammer Products.
 - 2. General Electric Co.; Electrical Distribution & Control Division.
 - 3. Square D/Group Schneider.
- B. Molded-Case Circuit Breaker: NEMA AB 1, with interrupting capacity to meet available fault currents.
 - 1. Thermal-Magnetic Circuit Breakers: Inverse time-current element for low-level overloads and instantaneous magnetic trip element for short circuits. Adjustable magnetic trip setting for circuit-breaker frame sizes 250 A and larger.
 - 2. Adjustable Instantaneous-Trip Circuit Breakers: Magnetic trip element with front-mounted, field-adjustable trip setting.
 - 3. Current-Limiting Circuit Breakers: Frame sizes 400 A and smaller and let-through ratings less than NEMA FU 1, RK-5.
 - 4. GFCI Circuit Breakers: Single- and two-pole configurations with 5-mA trip sensitivity.
- C. Molded-Case Circuit-Breaker Features and Accessories:
 - 1. Standard frame sizes, trip ratings, and number of poles.
 - 2. Lugs: Mechanical style suitable for number, size, trip ratings, and conductor material.
 - 3. Application Listing: Type SWD for switching fluorescent lighting loads; Type HACR for heating, air-conditioning, and refrigerating equipment.
 - 4. Ground-Fault Protection: Integrally mounted relay and trip unit with adjustable pickup and time-delay settings, push-to-test feature, and ground-fault indicator.
 - 5. Shunt Trip: 120-V trip coil energized from separate circuit, set to trip at 55 percent of rated voltage.

2.17 ENCLOSURES

- A. NEMA AB 1 and NEMA KS 1 to meet environmental conditions of installed location.
 - 1. Outdoor Locations: NEMA 250, Type 3R.
 - 2. Other Wet or Damp Indoor Locations: NEMA 250, Type 4.

2.18 CONTROLLERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. ABB Power Distribution, Inc.; ABB Control, Inc. Subsidiary.
 - 2. Eaton Corporation; Cutler-Hammer Products.
 - 3. Rockwell Automation; Allen-Bradley Co.; Industrial Control Group.

4. Square D.

B. Across-the-line Enclosed Controllers:

1. Manual Controller: NEMA ICS 2, general purpose, Class A, with "quick-make, quick-break" toggle or pushbutton action, and marked to show whether unit is "OFF," "ON," or "TRIPPED."
2. Overload Relay: Ambient-compensated type with inverse-time-current characteristics and NEMA ICS 2, Class 10 tripping characteristics. Relays shall have heaters and sensors in each phase, matched to nameplate, full-load current of specific motor to which they connect and shall have appropriate adjustment for duty cycle.

C. Magnetic Controller: NEMA ICS 2, Class A, full voltage, nonreversing, across the line, unless otherwise indicated.

1. Control Circuit: 120 V; obtained from integral control power transformer with a control power transformer of sufficient capacity to operate connected pilot, indicating and control devices, plus 100 percent spare capacity.
2. Overload Relay: Ambient-compensated type with inverse-time-current characteristic and NEMA ICS 2, Class 10 tripping characteristic. Provide with heaters or sensors in each phase matched to nameplate full-load current of specific motor to which they connect and with appropriate adjustment for duty cycle.

D. Combination Magnetic Controller: Factory-assembled combination controller and disconnect switch.

1. Fusible Disconnecting Means: NEMA KS 1, heavy-duty, fusible switch with rejection-type fuse clips rated for fuses. Select and size fuses to provide Type 2 protection according to IEC 947-4-1, as certified by an NRTL.
2. Nonfusible Disconnecting Means: NEMA KS 1, heavy-duty, nonfusible switch.
3. Circuit-Breaker Disconnecting Means: NEMA AB 1, motor-circuit protector with field-adjustable, short-circuit trip coordinated with motor locked-rotor amperes.

E. Enclosures:

1. Description: Flush- or surface-mounting cabinets as indicated. NEMA 250, Type 1, unless otherwise indicated.
 - a. Outdoor Locations: NEMA 250, Type 3R.

F. Accessories:

1. Devices shall be factory installed in controller enclosure, unless otherwise indicated.
2. Push-Button Stations, Pilot Lights, and Selector Switches: NEMA ICS 2, heavy-duty type.
3. Stop and Lockout Push-Button Station: Momentary-break, push-button station with a factory-applied hasp arranged so padlock can be used to lock control circuit open.
4. Control Relays: Auxiliary and adjustable time-delay relays.

2.19 PANELBOARDS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Eaton Corporation; Cutler-Hammer Products.
2. General Electric Co.; Electrical Distribution & Protection Div.
3. Square D.

- B. Lighting & Appliance Panelboards:

1. Enclosures: Flush- and surface-mounted cabinets. NEMA PB 1, Type 1, as scheduled on plans.
 - a. Rated for environmental conditions at installed location.
 - 1) Outdoor Locations: NEMA 250, Type 3R.
 - 2) Kitchen Areas: NEMA 250, Type 4X, stainless steel.
 - 3) Other Wet or Damp Indoor Locations: NEMA 250, Type 4.
 - b. Front: Secured to box with concealed trim clamps. For surface-mounted fronts, match box dimensions; for flush-mounted fronts, overlap box.
2. Doors: Concealed hinges; secured with flush latch with tumbler lock; keyed alike.
3. Phase and Ground Buses: Hard-drawn copper, 98 percent conductivity.
4. Conductor Connectors: Suitable for use with conductor material.
 - a. Ground Lugs and Bus Configured Terminators: Compression type.
5. Service Equipment Label: UL labeled for use as service equipment for panelboards with main service disconnect switches.
7. Future Devices: Mounting brackets, bus connections, and necessary appurtenances required for future installation of devices.
8. Panelboard Short-Circuit Rating: Fully rated to interrupt symmetrical short-circuit current available at terminals.

- C. Distribution Panelboards:

1. Doors: Secured with vault-type latch with tumbler lock; keyed alike.
2. Main Overcurrent Protective Devices: Circuit breaker.
3. Branch Overcurrent Protective Devices:
 - a. For Circuit-Breaker Frame Sizes Larger Than 125 A: Bolt-on circuit breakers; plug-in circuit breakers where individual positive-locking device requires mechanical release for removal.

D. Overcurrent Protective Devices:

1. Molded-Case Circuit Breaker: UL 489, with interrupting capacity to meet available fault currents.
 - a. Thermal-Magnetic Circuit Breakers: Inverse time-current element for low-level overloads, and instantaneous magnetic trip element for short circuits. Adjustable magnetic trip setting for circuit-breaker frame sizes 250 A and larger.
 - b. GFCI Circuit Breakers: Single- and two-pole configurations with 5-mA trip sensitivity.
 - c. Molded-Case Circuit-Breaker Features and Accessories: Standard frame sizes, trip ratings, and number of poles.
 - 1) Lugs: Compression style, suitable for number, size, trip ratings, and conductor materials.
 - 2) Application Listing: Appropriate for application; Type SWD for switching fluorescent lighting loads; Type HACR for heating, air-conditioning, and refrigerating equipment.
 - 3) Shunt Trip: 120-V trip coil energized from separate circuit, set to trip at 55percent of rated voltage.

2.20 FUSES

- A. Service Entrance: Class RK1, time delay .
- B. Feeders: Class RK5, time delay.
- C. Motor Branch Circuits: Class RK5, time delay.
- D. Other Branch Circuits: Class RK1, time delay.

PART 3 - EXECUTION

3.1 PLACING SYSTEM INTO SERVICE

- A. Do not energize or connect service entrance equipment, panelboards, control terminals, or data terminals to their sources until surge protection devices are installed and connected.

3.2 COMMON REQUIREMENTS FOR ELECTRICAL INSTALLATION

- A. Comply with NECA 300.
- B. Measure indicated mounting heights to bottom of unit for suspended items and to center of unit for wall-mounting items.

- C. Headroom Maintenance: If mounting heights or other location criteria are not indicated, arrange and install components and equipment to provide maximum possible headroom consistent with these requirements.
- D. Equipment: Install to facilitate service, maintenance, and repair or replacement of components of both electrical equipment and other nearby installations. Connect in such a way as to facilitate future disconnecting with minimum interference with other items in the vicinity.
- E. Right of Way: Give to raceways and piping systems installed at a required slope.

3.3 RACEWAY APPLICATION

- A. Outdoors: Apply raceway products as specified below, unless otherwise indicated:
 - 1. Exposed Conduit: Rigid steel conduit, or IMC,.
 - 2. Concealed Conduit, Aboveground: Rigid steel conduit or IMC or EMT.
 - 3. Underground Conduit: RNC, Type EPC-40-PVC, direct buried.
 - 4. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC.
 - 5. Boxes and Enclosures, Aboveground: NEMA 250, Type 3R.
- B. Comply with the following indoor applications, unless otherwise indicated:
 - 1. Exposed, Not Subject to Physical Damage: EMT..
 - 2. Exposed, Not Subject to Severe Physical Damage: IMC or EMT.
 - 3. Exposed and Subject to Severe Physical Damage: Rigid steel conduit or IMC. Includes raceways in the following locations:
 - a. Loading dock.
 - b. Mechanical rooms.
 - 4. Concealed in Ceilings and Interior Walls and Partitions: EMT.
 - 5. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC .
 - 6. Damp or Wet Locations: Rigid steel conduit or IMC.
 - 7. Raceways for Optical Fiber or Communications Cable: EMT.
 - 8. Boxes and Enclosures: NEMA 250, Type 1, except use NEMA 250, Type 4, stainless steel in damp or wet locations.
- C. Minimum Raceway Size: 3/4-inch trade size.
- D. Raceway Fittings: Compatible with raceways and suitable for use and location.
 - 1. Rigid and Intermediate Steel Conduit: Use threaded rigid steel conduit fittings, unless otherwise indicated.

3.4 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS

- A. Service Entrance: Type THHN-THWN, single conductors in raceway or Type XHHW, single conductors in raceway.
- B. Exposed Feeders: Type THHN-THWN, single conductors in raceway .
- C. Feeders Concealed in Ceilings, Walls, Partitions, and Crawlspace: Type THHN-THWN, single conductors in raceway, or Metal-clad cable, Type MC.
- D. Feeders Concealed in Concrete, below Slabs-on-Grade, and Underground: Type THHN-THWN, single conductors in raceway.
- E. Exposed Branch Circuits, Including in Crawlspace: Type THHN-THWN, single conductors in raceway or Metal-clad cable, Type MC].
- F. Branch Circuits Concealed in Ceilings, Walls, and Partitions: Type THHN-THWN, single conductors in raceway or Metal-clad cable, Type MC.
- G. Branch Circuits Concealed in Concrete, below Slabs-on-Grade, and Underground: Type THHN-THWN, single conductors in raceway
- H. Cord Drops and Portable Appliance Connections: Type SO, hard service cord with stainless-steel, wire-mesh, strain relief device at terminations to suit application.
- I. Class 1 Control Circuits: Type THHN-THWN, in raceway.
- J. Class 2 Control Circuits: Type THHN-THWN, in raceway or Power-limited cable, concealed behind accessible building finishes.

3.5 CONTROLLERS - APPLICATION

- A. Select features of each enclosed controller to coordinate with ratings and characteristics of supply circuit and motor; required control sequence; duty cycle of motor, controller, and load; and configuration of pilot device and control circuit affecting controller functions.

3.6 INSTALLATION

- A. Raceway:
 - 1. Comply with NECA 300 for installation requirements applicable to products specified in Part 2 except where requirements on Drawings or in this Article are stricter.
 - 2. Keep raceways at least 6 inches away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.
 - 3. Complete raceway installation before starting conductor installation.
 - 4. Support raceways as specified in Division 16 Section "Electrical Supports ."

5. Arrange stub-ups so curved portions of bends are not visible above the finished slab.
6. Conceal conduit and EMT within finished walls, ceilings, and floors, unless otherwise indicated.
7. Raceways Embedded in Slabs:
 - a. Run conduit larger than 1-inch trade size, parallel or at right angles to main reinforcement. Where at right angles to reinforcement, place conduit close to slab support.
 - b. Arrange raceways to cross building expansion joints at right angles with expansion fittings.
 - c. Change from ENT to RNC, Type EPC-40-PVC, rigid steel conduit, or IMC before rising above the floor.
8. Raceway Terminations at Locations Subject to Moisture or Vibration: Use insulating bushings to protect conductors, including conductors smaller than No. 4 AWG.
9. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb tensile strength. Leave at least 12 inches of slack at each end of pull wire.
10. Raceways for Optical Fiber and Communications Cable: Install as follows:
 - a. 3/4-Inch Trade Size and Smaller: Install raceways in maximum lengths of 50 feet.
 - b. 1-Inch Trade Size and Larger: Install raceways in maximum lengths of 75 feet.
 - c. Install with a maximum of two 90-degree bends or equivalent for each length of raceway unless Drawings show stricter requirements. Separate lengths with pull or junction boxes or terminations at distribution frames or cabinets where necessary to comply with these requirements.
11. Install raceway sealing fittings at suitable, approved, and accessible locations and fill them with listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings at the following points:
 - a. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
 - b. Where otherwise required by NFPA 70.
12. Expansion-Joint Fittings for RNC: Install in each run of aboveground conduit that is located where environmental temperature change may exceed 30 deg F, and that has straight-run length that exceeds 25 feet.
 - a. Install expansion-joint fittings for each of the following locations, and provide type and quantity of fittings that accommodate temperature change listed for location:
 - 1) Outdoor Locations Not Exposed to Direct Sunlight: 125 deg F temperature change.
 - b. Outdoor Locations Exposed to Direct Sunlight: 155 deg F temperature change.

- c. Indoor Spaces: Connected with the Outdoors without Physical Separation: 125 deg F temperature change.
 - d. Attics: 135 deg F temperature change.
 - 13. Install fitting(s) that provide expansion and contraction for at least 0.00041 inch per foot of length of straight run per deg F of temperature change.
 - 14. Install each expansion-joint fitting with position, mounting, and piston setting selected according to manufacturer's written instructions for conditions at specific location at the time of installation.
 - 15. Flexible Conduit Connections: Use maximum of 72 inches of flexible conduit for subject to vibration, noise transmission, or movement; and for transformers and motors.
 - a. Use LFMC in damp or wet locations.
 - 16. Recessed Boxes in Masonry Walls: Saw-cut opening for box in center of cell of masonry block, and install box flush with surface of wall.
 - 17. Set metal floor boxes level and flush with finished floor surface.
- B. Installation of Underground Conduit:
- 1. Direct-Buried Conduit:
 - a. Excavate trench bottom to provide firm and uniform support for conduit. Prepare trench bottom as specified in Division 2 Section "Earthwork" for pipe less than 6 inches in nominal diameter.
 - b. Install backfill as specified in Division 2 Section "Earthwork."
 - c. After installing conduit, backfill and compact. Start at tie-in point, and work toward end of conduit run, leaving conduit at end of run free to move with expansion and contraction as temperature changes during this process. Firmly hand tamp backfill around conduit to provide maximum supporting strength. After placing controlled backfill to within 12 inches of finished grade, make final conduit connection at end of run and complete backfilling with normal compaction as specified in Division 2 Section "Earthwork."
 - d. Install manufactured rigid steel conduit elbows for stub-ups at poles and equipment and at building entrances through the floor.
 - 1) Couple steel conduits to ducts with adapters designed for this purpose, and encase coupling with 3 inches of concrete.
 - 2) For stub-ups at equipment mounted on outdoor concrete bases, extend steel conduit horizontally a minimum of 60 inches from edge of equipment pad or foundation. Install insulated grounding bushings on terminations at equipment.
 - e. Warning Tape: Bury warning tape approximately 12 inches above direct-buried conduits. Align tape along the width and along the centerline of conduit.
- C. Installation of Conductors and Cables:

1. Conceal cables in finished walls, ceilings, and floors, unless otherwise indicated.
2. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.
3. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.
4. Install exposed cables parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.
5. Support cables according to Division 16 Section "Electrical Supports and Seismic Restraints."
6. Identify and color-code conductors and cables according to Division 16 Section "Electrical Identification."
7. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.
8. Make splices and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.
9. Wiring at Outlets: Install conductor at each outlet, with at least 12 inches of slack.

D. Wiring Devices:

1. Comply with NECA 1, including the mounting heights listed in that standard, unless otherwise noted.
2. Coordination with Other Trades:
 - a. Take steps to insure that devices and their boxes are protected. Do not place wall finish materials over device boxes and do not cut holes for boxes with routers that are guided by riding against outside of the boxes.
 - b. Keep outlet boxes free of plaster, drywall joint compound, mortar, cement, concrete, dust, paint, and other material that may contaminate the raceway system, conductors, and cables.
 - c. Install device boxes in brick or block walls so that the cover plate does not cross a joint unless the joint is troweled flush with the face of the wall.
 - d. Install wiring devices after all wall preparation, including painting, is complete.
3. Conductors:
 - a. Do not strip insulation from conductors until just before they are spliced or terminated on devices.
 - b. Strip insulation evenly around the conductor using tools designed for the purpose. Avoid scoring or nicking of solid wire or cutting strands from stranded wire.
 - c. The length of free conductors at outlets for devices shall meet provisions of NFPA 70, Article 300, without pigtails.
 - d. Existing Conductors:
 - 1) Cut back and pigtail, or replace all damaged conductors.
 - 2) Straighten conductors that remain and remove corrosion and foreign matter.

- 3) Pigtailing existing conductors is permitted provided the outlet box is large enough.

4. Device Installation:

- a. Replace all devices that have been in temporary use during construction or that show signs that they were installed before building finishing operations were complete.
- b. Keep each wiring device in its package or otherwise protected until it is time to connect conductors.
- c. Do not remove surface protection, such as plastic film and smudge covers, until the last possible moment.
- d. Connect devices to branch circuits using pigtails that are not less than 12 inches in length.
- e. When there is a choice, use side wiring with binding-head screw terminals. Wrap solid conductor tightly clockwise, 2/3 to 3/4 of the way around terminal screw.
- f. Use a torque screwdriver when a torque is recommended or required by the manufacturer.
- g. When conductors larger than No. 12 AWG are installed on 15- or 20-A circuits, splice No. 12 AWG pigtails for device connections.
- h. Tighten unused terminal screws on the device.
- i. When mounting into metal boxes, remove the fiber or plastic washers used to hold device mounting screws in yokes, allowing metal-to-metal contact.

5. Receptacle Orientation:

- a. Install ground pin of vertically mounted receptacles up, and on horizontally mounted receptacles to the left.

6. Device Plates: Do not use oversized or extra-deep plates. Repair wall finishes and remount outlet boxes when standard device plates do not fit flush or do not cover rough wall opening.

7. Dimmers:

- a. Install dimmers within terms of their listing.
- b. Verify that dimmers used for fan speed control are listed for that application.
- c. Install unshared neutral conductors on line and load side of dimmers according to manufacturers' device listing conditions in the written instructions.

8. Arrangement of Devices: Unless otherwise indicated, mount flush, with long dimension vertical and with grounding terminal of receptacles on top. Group adjacent switches under single, multigang wall plates.

E. Sleeve Installation for Electrical Penetrations:

1. Coordinate sleeve selection and application with selection and application of firestopping specified in Division 7 Section "Through-Penetration Firestop Systems."
2. Concrete Slabs and Walls: Install sleeves for penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of slabs and walls.

3. **Fire-Rated Assemblies:** Install sleeves for penetrations of fire-rated floor and wall assemblies unless openings compatible with firestop system used are fabricated during construction of floor or wall.
4. Extend sleeves installed in floors 2 inches above finished floor level.
5. Size pipe sleeves to provide 1/4-inch annular clear space between sleeve and cable unless sleeve seal is to be .
6. Seal space outside of sleeves with grout for penetrations of concrete and masonry and with approved joint compound for gypsum board assemblies.
7. **Interior Penetrations of Non-Fire-Rated Walls and Floors:** Seal annular space between sleeve and cable, using joint sealant appropriate for size, depth, and location of joint according to Division 7 Section "Joint Sealants."
8. **Fire-Rated-Assembly Penetrations:** Maintain indicated fire rating of walls, partitions, ceilings, and floors at cable penetrations. Install sleeves and seal with firestop materials according to Division 7 Section "Through-Penetration Firestop Systems."
9. **Roof-Penetration Sleeves:** Seal penetration of individual cables with flexible boot-type flashing units applied in coordination with roofing work.

F. Contactor Installation:

1. Mount electrically held lighting contactors with elastomeric isolator pads, to eliminate structure-borne vibration, unless contactors are installed in an enclosure with factory-installed vibration isolators.

G. Enclosure - Wiring Installation:

1. **Wiring within Enclosures:** Comply with NECA 1. Separate power-limited and nonpower-limited conductors according to conductor manufacturer's written instructions.
2. Size conductors according to lighting control device manufacturer's written instructions, unless otherwise indicated.
3. **Splices, Taps, and Terminations:** Make connections only on numbered terminal strips in junction, pull, and outlet boxes; terminal cabinets; and equipment enclosures.

H. Installation of Surge Protection Devices:

1. Install devices at service entrance on load side, with ground lead bonded to service entrance ground.
2. Install devices for panelboard and auxiliary panels with conductors or buses between suppressor and points of attachment as short and straight as possible. Do not exceed manufacturer's recommended lead length. Do not bond neutral and ground.
 - a. Provide multipole, 60-A circuit breaker as a dedicated disconnect for suppressor, unless otherwise indicated.

I. Installation -Enclosed Switches & Breakers:

1. Comply with applicable portions of NECA 1, NEMA PB 1.1, and NEMA PB 2.1 for installation of enclosed switches and circuit breakers.

2. Mount individual wall-mounting switches and circuit breakers with tops at uniform height, unless otherwise indicated.
3. Comply with mounting and anchoring requirements specified in Division 16 Section "Electrical Supports"
4. Temporary Lifting Provisions: Remove temporary lifting eyes, channels, and brackets and temporary blocking of moving parts from enclosures and components.
5. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs as specified in Division 16 Section "Electrical Identification."

J. Installation - Controllers:

1. For control equipment at walls, bolt units to wall or mount on lightweight structural-steel channels bolted to wall. For controllers not at walls, provide freestanding racks.
2. Install freestanding equipment on concrete bases.
3. Comply with mounting and anchoring requirements specified in Division 16 Section "Electrical Supports."

K. Enclosed Controller Fuses: Install fuses in each fusible switch.

L. Installation - Panelboards:

1. Install panelboards and accessories according to NEMA PB 1.1.
2. Comply with mounting and anchoring requirements specified in Division 16 Section "Electrical Supports."
3. Mount top of trim 74 inches above finished floor, unless otherwise indicated.
4. Mount plumb and rigid without distortion of box. Mount recessed panelboards with fronts uniformly flush with wall finish.
5. Install overcurrent protective devices and controllers.
 - a. Set field-adjustable switches and circuit-breaker trip ranges.
6. Install filler plates in unused spaces
7. Stub four 1-inch empty conduits from panelboard into accessible ceiling space or space designated to be ceiling space in the future. Stub four 1-inch empty conduits into raised floor space or below slab not on grade.
8. Arrange conductors in gutters into groups and bundle and wrap with wire .

3.7 FIELD QUALITY CONTROL

A. Perform tests and inspections and prepare test reports.

B. Tests and Inspections Wire & Cable:

1. After installing conductors and cables and before electrical circuitry has been energized, test for compliance with requirements.
2. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.

3. **Infrared Scanning:** After Substantial Completion, but not more than 60 days after Final Acceptance, perform an infrared scan of each splice in cables and conductors No. 3 AWG and larger. Remove box and equipment covers so splices are accessible to portable scanner.
 - a. **Follow-up Infrared Scanning:** Perform an additional follow-up infrared scan of each splice 11 months after date of Substantial Completion.
 - b. **Instrument:** Use an infrared scanning device designed to measure temperature or to detect significant deviations from normal values. Provide calibration record for device.
 - c. **Record of Infrared Scanning:** Prepare a certified report that identifies splices checked and that describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.
- C. **Perform tests and inspections and prepare test reports.**
 1. **Test Instruments:** Use instruments that comply with UL 1436.
 2. **Test Instrument for Convenience Receptacles:** Digital wiring analyzer with digital readout or illuminated LED indicators of measurement.
- D. **Tests for Convenience Receptacles:**
 1. **Line Voltage:** Acceptable range is 105 to 132 V.
 2. **Percent Voltage Drop under 15-A Load:** A value of 6 percent or higher is not acceptable.
 3. **Ground Impedance:** Values of up to 2 ohms are acceptable.
 4. **GFCI Trip:** Test for tripping values specified in UL 1436 and UL 943.
 5. Using the test plug, verify that the device and its outlet box are securely mounted.
 6. The tests shall be diagnostic, indicating damaged conductors, high resistance at the circuit breaker, poor connections, inadequate fault current path, defective devices, or similar problems. Correct circuit conditions, remove malfunctioning units and replace with new, and retest as specified above.
- E. **Tests for Lighting Control Devices:**
 1. **Perform the following field tests and inspections and prepare test reports:**
 - a. After installing time switches and sensors, and after electrical circuitry has been energized, adjust and test for compliance with requirements.
 - b. **Operational Test:** Verify operation of each lighting control device, and adjust time delays.
 2. **Lighting control devices that fail tests and inspections are defective work.**
- F. **Tests for Transient Voltage Suppression Equipment:**
 1. **Perform the following field tests and inspections and prepare test reports:**
 - a. **Complete startup checks** according to manufacturer's written instructions.

- b. Perform each visual and mechanical inspection and electrical test stated in NETA ATS, "Surge Arresters, Low-Voltage Surge Protection Devices" Section. Certify compliance with test parameters.

G. Tests for Controllers:

- 1. Prepare for acceptance testing as follows:
 - a. Inspect mechanical and electrical connections.
 - b. Verify switch and relay type and labeling verification.
 - c. Verify rating of installed fuses.

H. Tests for Enclosed Switches, Circuit Breakers, and Panelboards:

- 1. Prepare for acceptance tests as follows:
 - a. Test insulation resistance for each panelboard bus, component, connecting supply, feeder, and control circuit.
 - b. Test continuity of each circuit.
- 2. Perform the following field tests and inspections and prepare test reports:
 - a. Perform each electrical test and visual and mechanical inspection stated in NETA ATS, Section 7.5 for switches and Section 7.6 for molded-case circuit breakers. Certify compliance with test parameters.
 - b. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.

I. Test Reports: Prepare a written report to record the following:

- 1. Test procedures used.
- 2. Test results that comply with requirements.
- 3. Test results that do not comply with requirements and corrective action taken to achieve compliance with requirements.

J. Remove and replace malfunctioning units and retest as specified above.

3.8 IDENTIFICATION

A. Lighting Control Devices:

- 1. Identify components and power and control wiring according to Division 16 Section "Electrical Identification."
 - a. Identify controlled circuits in lighting contactors.
 - b. Identify circuits or luminaires controlled by photoelectric and occupancy sensors at each sensor.

2. Label time switches and contactors with a unique designation.

B. Identification Panelboards:

1. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs as specified in Division 16 Section "Electrical Identification."
2. Create a directory to indicate installed circuit. Obtain approval before installing. Use a computer or typewriter to create directory; handwritten directories are not acceptable.
3. Panelboard Nameplates: Label each panelboard with engraved metal or laminated-plastic nameplate mounted with corrosion-resistant screws.

C. Identification - Fuses:

1. Install labels indicating fuse replacement information on inside door of each fused switch.

3.9 FIRESTOPPING

- A.** Apply firestopping to electrical penetrations of fire-rated floor and wall assemblies to restore original fire-resistance rating of assembly according to Division 7 Section "Through-Penetration Firestop Systems."

3.10 FIELD QUALITY CONTROL

- A.** Perform tests and inspections and prepare test reports.

B. Tests and Inspections -Wire and Cable:

1. After installing conductors and cables and before electrical circuitry has been energized, test conductors for compliance with requirements.
2. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
3. Infrared Scanning: After Substantial Completion, but not more than 60 days after Final Acceptance, perform an infrared scan of each splice in cables and conductors No. 3 AWG and larger. Remove box and equipment covers so splices are accessible to portable scanner.
 - a. Follow-up Infrared Scanning: Perform an additional follow-up infrared scan of each splice 11 months after date of Substantial Completion.
 - b. Instrument: Use an infrared scanning device designed to measure temperature or to detect significant deviations from normal values. Provide calibration record for device.
 - c. Record of Infrared Scanning: Prepare a certified report that identifies splices checked and that describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.
4. Perform tests and inspections and prepare test reports.
5. Test Instruments: Use instruments that comply with UL 1436.

6. Test Instrument for Convenience Receptacles: Digital wiring analyzer with digital readout or illuminated LED indicators of measurement.

C. Tests for Convenience Receptacles and Other Outlets:

1. Line Voltage: Acceptable range is 105 to 132 V.
2. Percent Voltage Drop under 15-A Load: A value of 6 percent or higher is not acceptable.
3. Ground Impedance: Values of up to 2 ohms are acceptable.
4. GFCI Trip: Test for tripping values specified in UL 1436 and UL 943.
5. Using the test plug, verify that the device and its outlet box are securely mounted.
6. The tests shall be diagnostic, indicating damaged conductors, high resistance at the circuit breaker, poor connections, inadequate fault current path, defective devices, or similar problems. Correct circuit conditions, remove malfunctioning units and replace with new, and retest as specified above.

D. Tests for Controllers:

1. Perform each electrical test and visual and mechanical inspection, except optional tests, stated in NETA ATS, "Motor Control - Motor Starters." Certify compliance with test parameters

E. Tests for Panelboards:

1. Test insulation resistance for each panelboard bus, component, connecting supply, feeder, and control circuit.
2. Test continuity of each circuit.
3. Perform the following field tests and inspections and prepare test reports:
4. Perform each electrical test and visual and mechanical inspection stated in NETA ATS, Section 7.5 for switches and Section 7.6 for molded-case circuit breakers. Certify compliance with test parameters.
5. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.
6. Load Balancing: After Substantial Completion, but not more than 60 days after Final Acceptance, measure load balancing and make circuit changes.
7. Measure as directed during period of normal system loading.
8. Perform load-balancing circuit changes outside normal occupancy/working schedule of the facility and at time directed. Avoid disrupting critical 24-hour services such as fax machines and on-line data processing, computing, transmitting, and receiving equipment.
9. After circuit changes, recheck loads during normal load period. Record all load readings before and after changes and submit test records.
10. Tolerance: Difference exceeding 20 percent between phase loads, within a panelboard, is not acceptable. Rebalance and recheck as necessary to meet this minimum requirement.
11. Infrared Scanning: After Substantial Completion, but not more than 60 days after Final Acceptance, perform an infrared scanning of each panelboard. Remove panel fronts so joints and connections are accessible to portable scanner.
12. Follow-up Infrared Scanning: Perform an additional follow-up infrared scan of each panelboard 11 months after date of Substantial Completion.

13. **Instrument:** Use an infrared scanning device designed to measure temperature or to detect significant deviations from normal values. Provide calibration record for device.
14. **Record of Infrared Scanning:** Prepare a certified report that identifies panelboards checked and describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

F. **Test Reports:** Prepare a written report to record the following:

1. Test procedures used.
2. Test results that comply with requirements.
3. Test results that do not comply with requirements and corrective action taken to achieve compliance with requirements.

G. Remove and replace malfunctioning units and retest as specified

H. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.

3.11 CLEANING

- A. On completion of installation, inspect interior and exterior of panelboards. Remove paint splatters and other spots. Vacuum dirt and debris; do not use compressed air to assist in cleaning. Repair exposed surfaces to match original finish.

END OF SECTION 16050

SECTION 16060 - GROUNDING AND BONDING

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes methods and materials for grounding systems and equipment.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Field quality-control test reports.

1.3 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Comply with UL 467 for grounding and bonding materials and equipment.

PART 2 - PRODUCTS

2.1 CONDUCTORS

- A. Insulated Conductors: Copper or tinned-copper wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction.
- B. Bare Copper Conductors:
 - 1. Solid Conductors: ASTM B 3.
 - 2. Stranded Conductors: ASTM B 8.
 - 3. Tinned Conductors: ASTM B 33.
 - 4. Bonding Cable: 28 kcmil, 14 strands of No. 17 AWG conductor, 1/4 inch in diameter.
 - 5. Bonding Conductor: No. 4 AWG, stranded conductor, minimum.
 - 6. Bonding Jumper: Copper tape, braided conductors, terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.

2.2 CONNECTORS

- A. Listed and labeled by a nationally recognized testing laboratory acceptable to authorities having jurisdiction for applications in which used, and for specific types, sizes, and combinations of conductors and other items connected.

- B. Bolted Connectors for Conductors and Pipes: Copper or copper alloy, bolted pressure-type, with at least two bolts.

- 1. Pipe Connectors: Clamp type, sized for pipe.

- C. Welded Connectors: Exothermic-welding kits of types recommended by kit manufacturer for materials being joined and installation conditions.

2.3 GROUNDING ELECTRODES

- A. Ground Rods: Copper-clad steel, sectional type; 3/4 inch by 10 feet in diameter.

PART 3 - EXECUTION

3.1 APPLICATIONS

- A. Conductors: Install solid conductor for No. 10 AWG and smaller, and stranded conductors for No. 8 AWG and larger, unless otherwise indicated.
- B. Underground Grounding Conductors: Install bare tinned-copper conductor, No. 2/0 AWG minimum. Bury at least 24 inches below grade.
- C. Isolated Grounding Conductors: Green-colored insulation with continuous yellow stripe. On feeders with isolated ground, identify grounding conductor where visible to normal inspection, with alternating bands of green and yellow tape, with at least three bands of green and two bands of yellow.
- D. Conductor Terminations and Connections:
 - 1. Pipe and Equipment Grounding Conductor Terminations: Bolted connectors.
 - 2. Underground Connections: Welded connectors, except at test wells and as otherwise indicated.
 - 3. Connections to Ground Rods at Test Wells: Bolted connectors.
 - 4. Connections to Structural Steel: Welded connectors.

3.2 EQUIPMENT GROUNDING

- A. Install insulated equipment grounding conductors with the following items, in addition to those required by NFPA 70:
 - 1. Feeders and branch circuits.
 - 2. Lighting circuits.
 - 3. Receptacle circuits.
 - 4. Single-phase motor and appliance branch circuits.
 - 5. Three-phase motor and appliance branch circuits.
 - 6. Flexible raceway runs.

7. Metal-clad cable runs.
 8. Computer and Rack-Mounted Electronic Equipment Circuits: Install insulated equipment grounding conductor in branch-circuit runs from equipment-area power panels and power-distribution units.
- B. Water Heater: Install a separate insulated equipment grounding conductor to each electric water heater. Bond conductor to heater units, piping, connected equipment, and components.
- C. Isolated Grounding Receptacle Circuits: Install an insulated equipment grounding conductor connected to the receptacle grounding terminal. Isolate conductor from raceway and from panelboard grounding terminals. Terminate at equipment grounding conductor terminal of the applicable derived system or service, unless otherwise indicated.
- D. Isolated Equipment Enclosure Circuits: For designated equipment supplied by a branch circuit or feeder, isolate equipment enclosure from supply circuit raceway with a nonmetallic raceway fitting listed for the purpose. Install fitting where raceway enters enclosure, and install a separate insulated equipment grounding conductor. Isolate conductor from raceway and from panelboard grounding terminals. Terminate at equipment grounding conductor terminal of the applicable derived system or service, unless otherwise indicated.
- E. Signal and Communication Equipment: For telephone, alarm, voice and data, and other communication equipment, provide No. 2/0 AWG minimum insulated grounding conductor in raceway from grounding electrode system to each service location, terminal cabinet, wiring closet, and central equipment location.
1. Service and Central Equipment Locations and Wiring Closets: Terminate grounding conductor on a 1/4-by-2-by-12-inch grounding bus.
 2. Terminal Cabinets: Terminate grounding conductor on cabinet grounding terminal
- F. Composite or Concrete Poles Supporting Outdoor Lighting Fixtures: Install grounding electrode and a separate insulated equipment grounding conductor in addition to grounding conductor installed with branch-circuit conductors.
- 3.3 INSTALLATION
- A. Grounding Conductors: Route along shortest and straightest paths possible, unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.
- B. Ground Rods: Drive rods until tops are 12 inches below finished floor or final grade, unless otherwise indicated.
1. Interconnect ground rods with grounding electrode conductor below grade and as otherwise indicated. Make connections without exposing steel or damaging coating, if any. Minimum depth of bury is 24" below final grade per NEC.

2. For grounding electrode system, install at least three rods spaced at least two-rod lengths from each other and located at least the same distance from other grounding electrodes, and connect to the service grounding electrode conductor.
- C. Test Wells: Ground rod driven through drilled hole in bottom of handhole. Handholes shall be at least 12 inches deep, with cover.
1. Test Wells: Install at least one test well for each service, unless otherwise indicated. Install at the ground rod electrically closest to service entrance. Set top of test well flush with finished grade or floor.
- D. Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance, except where routed through short lengths of conduit.
1. Bonding to Structure: Bond straps directly to basic structure, taking care not to penetrate any adjacent parts.
 2. Bonding to Equipment Mounted on Vibration Isolation Hangers and Supports: Install so vibration is not transmitted to rigidly mounted equipment.
 3. Use exothermic-welded connectors for outdoor locations, but if a disconnect-type connection is required, use a bolted clamp.
- E. Grounding and Bonding for Piping:
1. Metal Water Service Pipe: Install insulated copper grounding conductors, in conduit, from building's main service equipment, or grounding bus, to main metal water service entrances to building. Connect grounding conductors to main metal water service pipes, using a bolted clamp connector or by bolting a lug-type connector to a pipe flange, using one of the lug bolts of the flange. Where a dielectric main water fitting is installed, connect grounding conductor on street side of fitting. Bond metal grounding conductor conduit or sleeve to conductor at each end.
 2. Water Meter Piping: Use braided-type bonding jumpers to electrically bypass water meters. Connect to pipe with a bolted connector.
 3. Bond each aboveground portion of gas piping system downstream from equipment shutoff valve.

3.4 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections and prepare test reports:
1. After installing grounding system but before permanent electrical circuits have been energized, test for compliance with requirements.
 2. Test completed grounding system at each location where a maximum ground-resistance level is specified, at service disconnect enclosure grounding terminal, and at ground test wells.

- a. Measure ground resistance not less than two full days after last trace of precipitation and without soil being moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance.
 - b. Perform tests by fall-of-potential method according to IEEE 81.
- B. Report measured ground resistances that exceed the following values.
 - 1. Power and Lighting Equipment or System: 3 ohms.
- C. Excessive Ground Resistance: If resistance to ground exceeds specified values, notify Architect promptly and include recommendations to reduce ground resistance without additional cost to the Contract.

END OF SECTION 16060

SECTION 16073 - HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Hangers and supports for electrical equipment and systems.

1.3 DEFINITIONS

- A. EMT: Electrical metallic tubing.
- B. IMC: Intermediate metal conduit.
- C. RMC: Rigid metal conduit.

1.4 PERFORMANCE REQUIREMENTS

- A. Design supports for multiple raceways capable of supporting combined weight of supported systems and its contents.
- B. Rated Strength: Adequate in tension, shear, and pullout force to resist maximum loads calculated or imposed for this Project, with a minimum structural safety factor of five times the applied force.

1.5 QUALITY ASSURANCE

- A. Comply with NFPA 70.

1.6 COORDINATION

- A. Coordinate size and location of concrete bases. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified in Division 3.
- B. Coordinate installation of roof curbs, equipment supports, and roof penetrations. These items are specified in Division 7 Section "Roof Accessories."

PART 2 - PRODUCTS

2.1 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS

- A. Steel Slotted Support Systems: Comply with MFMA-4, factory-fabricated components for field assembly.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Allied Tube & Conduit.
 - b. Cooper B-Line, Inc.; a division of Cooper Industries.
 - c. ERICO International Corporation.
 - d. GS Metals Corp.
 - e. Thomas & Betts Corporation.
 - f. Unistrut; Tyco International, Ltd.
 - 2. Metallic Coatings: Hot-dip galvanized after fabrication and applied according to MFMA-4.
 - 3. Nonmetallic Coatings: Manufacturer's standard PVC, polyurethane, or polyester coating applied according to MFMA-4.
 - 4. Painted Coatings: Manufacturer's standard painted coating applied according to MFMA-4.
 - 5. Channel Dimensions: Selected for applicable load criteria.
- B. Raceway and Cable Supports: As described in NECA 1 and NECA 101.
- C. Conduit and Cable Support Devices: Steel and malleable-iron hangers, clamps, and associated fittings, designed for types and sizes of raceway or cable to be supported.
- D. Support for Conductors in Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug or plugs for non-armored electrical conductors or cables in riser conduits. Plugs shall have number, size, and shape of conductor gripping pieces as required to suit individual conductors or cables supported. Body shall be malleable iron.
- E. Structural Steel for Fabricated Supports and Restraints: ASTM A 36/A 36M, steel plates, shapes, and bars; black and galvanized.
- F. Mounting, Anchoring, and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:
 - 1. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened portland cement concrete, steel, or wood, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.
 - a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- 1) Hilti Inc.
 - 2) ITW Ramset/Red Head; a division of Illinois Tool Works, Inc.
 - 3) MKT Fastening, LLC.
 - 4) Simpson Strong-Tie Co., Inc.; Masterset Fastening Systems Unit.
2. Mechanical-Expansion Anchors: Insert-wedge-type, stainless steel, for use in hardened portland cement concrete with tension, shear, and pullout capacities appropriate for supported loads and building materials in which used.
- a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
- 1) Cooper B-Line, Inc.; a division of Cooper Industries.
 - 2) Hilti Inc.
 - 3) ITW Ramset/Red Head; a division of Illinois Tool Works, Inc.
 - 4) MKT Fastening, LLC.
3. Concrete Inserts: Steel or malleable-iron, slotted support system units similar to MSS Type 18; complying with MFMA-4 or MSS SP-58.
 4. Clamps for Attachment to Steel Structural Elements: MSS SP-58, type suitable for attached structural element.
 5. Through Bolts: Structural type, hex head, and high strength. Comply with ASTM A 325.
 6. Toggle Bolts: All-steel springhead type.
 7. Hanger Rods: Threaded steel.

2.2 FABRICATED METAL EQUIPMENT SUPPORT ASSEMBLIES

- A. Description: Welded or bolted, structural-steel shapes, shop or field fabricated to fit dimensions of supported equipment.
- B. Materials: Comply with requirements in Division 5 Section "Metal Fabrications" for steel shapes and plates.

PART 3 - EXECUTION

3.1 APPLICATION

- A. Comply with NECA 1 and NECA 101 for application of hangers and supports for electrical equipment and systems except if requirements in this Section are stricter.
- B. Maximum Support Spacing and Minimum Hanger Rod Size for Raceway: Space supports for EMT, IMC, and RMC as required by NFPA 70. Minimum rod size shall be 1/4 inch in diameter.
- C. Multiple Raceways or Cables: Install trapeze-type supports fabricated with steel slotted or other support system, sized so capacity can be increased by at least 25 percent in future without exceeding specified design load limits.

1. Secure raceways and cables to these supports with single-bolt conduit clamps using spring friction action for retention in support channel.
- D. Spring-steel clamps designed for supporting single conduits without bolts may be used for 1-1/2-inch and smaller raceways serving branch circuits and communication systems above suspended ceilings and for fastening raceways to trapeze supports.

3.2 SUPPORT INSTALLATION

- A. Comply with NECA 1 and NECA 101 for installation requirements except as specified in this Article.
- B. Strength of Support Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lb.
- C. Mounting and Anchorage of Surface-Mounted Equipment and Components: Anchor and fasten electrical items and their supports to building structural elements by the following methods unless otherwise indicated by code:
 1. To Wood: Fasten with lag screws or through bolts.
 2. To New Concrete: Bolt to concrete inserts.
 3. To Masonry: Approved toggle-type bolts on hollow masonry units and expansion anchor fasteners on solid masonry units.
 4. To Existing Concrete: Expansion anchor fasteners.
 5. Instead of expansion anchors, powder-actuated driven threaded studs provided with lock washers and nuts may be used in existing standard-weight concrete 4 inches thick or greater. Do not use for anchorage to lightweight-aggregate concrete or for slabs less than 4 inches thick.
 6. To Steel: Beam clamps (MSS Type 19, 21, 23, 25, or 27) complying with MSS SP-69.
 7. To Light Steel: Sheet metal screws.
 8. Items Mounted on Hollow Walls and Nonstructural Building Surfaces: Mount cabinets, panelboards, disconnect switches, control enclosures, pull and junction boxes, transformers, and other devices on slotted-channel racks attached to substrate.
- D. Drill holes for expansion anchors in concrete at locations and to depths that avoid reinforcing bars.

3.3 INSTALLATION OF FABRICATED METAL SUPPORTS

- A. Comply with installation requirements in Division 5 Section "Metal Fabrications" for site-fabricated metal supports.
- B. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor electrical materials and equipment.
- C. Field Welding: Comply with AWS D1.1/D1.1M.

3.4 CONCRETE BASES

- A. Construct concrete bases of dimensions indicated but not less than 4 inches larger in both directions than supported unit, and so anchors will be a minimum of 10 bolt diameters from edge of the base.
- B. Use 3000-psi, 28-day compressive-strength concrete. Concrete materials, reinforcement, and placement requirements are specified in Division 3 Section "Cast-in-Place Concrete (Limited Applications)."
- C. Anchor equipment to concrete base.
 - 1. Place and secure anchorage devices. Use supported equipment manufacturer's setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 - 2. Install anchor bolts to elevations required for proper attachment to supported equipment.
 - 3. Install anchor bolts according to anchor-bolt manufacturer's written instructions.

3.5 PAINTING

- A. Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.
 - 1. Apply paint by brush or spray to provide minimum dry film thickness of 2.0 mils.
- B. Touchup: Comply with requirements in Division 9 painting Sections for cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint on miscellaneous metal.
- C. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

END OF SECTION 16073



SECTION 16211 - ELECTRICITY METERING

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes equipment for utility company's electricity metering.

1.2 DESCRIPTION

- A. Underground medium voltage feeder from Utility Company system to pad mounted transformer (by Utility Company) located on site. Metering by C.T.'s located in a current transformer enclosure with meter remotely located as shown on drawings.
- B. Service Characteristics:
 - 1. Secondary: 3 phase, 4 wire, 60 Hertz, 120/208 volts.
- C. Metering: Equipment generally provided by Utility Company and installed by Contractor in strict accordance with the Utility Company's requirements, regulations, and directives. This contractor shall provide and install the meter base.

1.3 SUBMITTALS

- A. Product Data: For each metering component specified.
- B. Shop Drawings for Electricity-Metering Equipment: Include dimensioned plans and sections or elevation layouts. Include wiring diagrams showing power, signal, and control wiring specific to this Project.
- C. Operation and Maintenance Data: For electricity-metering equipment to include in emergency, operation, and maintenance manuals.

1.4 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Provide service-entrance equipment and accessories which are UL-listed and labeled, and marked "SUITABLE FOR USE AS SERVICE EQUIPMENT".
- C. IEEE Compliance: Comply with applicable requirements of IEEE Std 241 pertaining to service entrances.

1.5 COORDINATION

- A. Electrical Service Connections: Coordinate with utility companies and components they furnish.
- B. The Utility Company is Clay Electric, 3600 South First St., Lake City, FL 32055. (Dewitt Law (904)961-0103).

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
 - 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.

2.2 EQUIPMENT FOR ELECTRICITY METERING BY UTILITY COMPANY

- A. Current-Transformer Cabinets: Comply with requirements of electrical power utility company.
- B. Meter Sockets: Comply with requirements of electrical power utility company.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Comply with equipment installation requirements in NECA 1.
- B. Install equipment for utility company metering. Install raceways and equipment according to utility company's written requirements. Provide empty conduits for metering leads and extend grounding connections as required by utility company.

END OF SECTION 16211

SECTION 16511 - INTERIOR LIGHTING

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Interior lighting fixtures, lamps, and ballasts.
 - 2. Emergency lighting units.
 - 3. Exit signs.
 - 4. Lighting fixture supports.
- B. See Division 16 Section "Wiring Devices" for manual wall-box dimmers for incandescent lamps.

1.2 SUBMITTALS

- A. Product Data: For each type of lighting fixture, arranged in order of fixture designation. Include data on features, accessories, finishes.
- B. Product Certificates: For each type of ballast for bi-level and dimmer-controlled fixtures, signed by product manufacturer.
- C. Field quality-control test reports.

1.3 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. In Interior Lighting Fixture Schedule where titles below are column or row headings that introduce lists, the following requirements apply to product selection:
 - 1. Basis-of-Design Product: The design for each lighting fixture is based on the product named. Subject to compliance with requirements, provide either the named product or a comparable product by one of the other manufacturers specified.

2.2 LIGHTING FIXTURES AND COMPONENTS, GENERAL REQUIREMENTS

- A. Recessed Fixtures: Comply with NEMA LE 4 for ceiling compatibility for recessed fixtures.
- B. Incandescent Fixtures: Comply with UL 1598. Where LER is specified, test according to NEMA LE 5A.
- C. Fluorescent Fixtures: Comply with UL 1598. Where LER is specified, test according to NEMA LE 5 and NEMA LE 5A as applicable.
- D. HID Fixtures: Comply with UL 1598. Where LER is specified, test according to NEMA LE 5B.
- E. Metal Parts: Free of burrs and sharp corners and edges.
- F. Sheet Metal Components: Steel, unless otherwise indicated. Form and support to prevent warping and sagging.
- G. Doors, Frames, and Other Internal Access: Smooth operating, free of light leakage under operating conditions, and designed to permit relamping without use of tools. Designed to prevent doors, frames, lenses, diffusers, and other components from falling accidentally during relamping and when secured in operating position.
- H. Reflecting surfaces shall have minimum reflectance as follows, unless otherwise indicated:
 - 1. White Surfaces: 85 percent.
 - 2. Specular Surfaces: 83 percent.
 - 3. Diffusing Specular Surfaces: 75 percent.
 - 4. Laminated Silver Metallized Film: 90 percent.
- I. Plastic Diffusers, Covers, and Globes:
 - 1. Acrylic Lighting Diffusers: 100 percent virgin acrylic plastic. High resistance to yellowing and other changes due to aging, exposure to heat, and UV radiation.
 - a. Lens Thickness: At least 0.125 inch minimum unless different thickness is indicated.
 - b. UV stabilized.
 - 2. Glass: Annealed crystal glass, unless otherwise indicated.

2.3 BALLASTS

- A. Electronic Ballasts for Linear Fluorescent Lamps: Comply with ANSI C82.11; programmed-start type, unless otherwise indicated, and designed for type and quantity of lamps served. Ballasts shall be designed for full light output unless dimmer or bi-level control is indicated.
 - 1. Sound Rating: A.
 - 2. Total Harmonic Distortion Rating: Less than 20 percent.

3. Transient Voltage Protection: IEEE C62.41, Category A or better.
 4. Operating Frequency: 42 kHz or higher.
 5. Lamp Current Crest Factor: 1.7 or less.
 6. BF: 0.85 or higher.
 7. Power Factor: 0.95 or higher.
- B. Electromagnetic Ballasts for Linear Fluorescent Lamps: Comply with ANSI C82.1; energy saving, high-power factor, Class P, and having automatic-reset thermal protection.
1. Ballast Manufacturer Certification: Indicated by label.
- C. Ballasts for Temperatures Minus 20 Deg F and Higher for Linear Fluorescent Lamps: Electromagnetic type designed for use with indicated lamp types.
- D. Ballasts for Dimmer-Controlled Lighting Fixtures with Linear Fluorescent Lamps: Electronic type.
1. Dimming Range: 100 to 5 percent of rated lamp lumens.
 2. Ballast Input Watts: Can be reduced to 20 percent of normal.
 3. Compatibility: Certified by manufacturer for use with specific dimming control system and lamp type indicated.
- E. Ballasts for Compact Fluorescent Lamps: Electronic programmed rapid-start type, complying with ANSI C 82.11, designed for type and quantity of lamps indicated. Ballast shall be designed for full light output unless dimmer or bi-level control is indicated:
1. Lamp end-of-life detection and shutdown circuit.
 2. Automatic lamp starting after lamp replacement.
 3. Sound Rating: A.
 4. Total Harmonic Distortion Rating: Less than 20 percent.
 5. Transient Voltage Protection: IEEE C62.41, Category A or better.
 6. Operating Frequency: 20 kHz or higher.
 7. Lamp Current Crest Factor: 1.7 or less.
 8. BF: 0.95 or higher, unless otherwise indicated.
 9. Power Factor: 0.95 or higher.
 10. Interference: Comply with 47 CFR, Chapter 1, Part 18, Subpart C, for limitations on electromagnetic and radio-frequency interference for nonconsumer equipment.
 11. Ballast Case Temperature: 75 deg C, maximum.
- F. Internal-Type Emergency Fluorescent Power Unit: Self-contained, modular, battery-inverter unit, factory mounted within lighting fixture body and compatible with ballast. Comply with UL 924.
1. Emergency Connection: Operate 1 fluorescent lamp continuously at an output of 1100 lumens. Connect unswitched circuit to battery-inverter unit and switched circuit to fixture ballast.
 2. Night-Light Connection: Operate one fluorescent lamp continuously.
 3. Test Push Button and Indicator Light: Visible and accessible without opening fixture or entering ceiling space.

- a. Push Button: Push-to-test type, in unit housing, simulates loss of normal power and demonstrates unit operability.
 - b. Indicator Light: LED indicates normal power on. Normal glow indicates trickle charge; bright glow indicates charging at end of discharge cycle.
- 4. Battery: Sealed, maintenance-free, nickel-cadmium type.
- 5. Charger: Fully automatic, solid-state, constant-current type with sealed power transfer relay.
- G. Electronic Ballast for Metal-Halide Lamps: Include the following features unless otherwise indicated:
 - 1. Lamp end-of-life detection and shutdown circuit.
 - 2. Sound Rating: A.
 - 3. Total Harmonic Distortion Rating: Less than 15 percent.
 - 4. Transient Voltage Protection: IEEE C62.41, Category A or better.
 - 5. Lamp Current Crest Factor: 1.5 or less.
 - 6. Power Factor: .90 or higher.
 - 7. Interference: Comply with 47 CFR, Chapter 1, Part 18, Subpart C, for limitations on electromagnetic and radio-frequency interference for nonconsumer equipment.
 - 8. Protection: Class P thermal cutout.

2.4 EXIT SIGNS

- A. Internally Lighted Signs: Comply with UL 924; for sign colors, visibility, luminance, and lettering size, comply with authorities having jurisdiction.
 - 1. Lamps for AC Operation: LEDs, 70,000 hours minimum rated lamp life.

2.5 LAMPS

- A. Low-Mercury Fluorescent Lamps: Comply with EPA's toxicity characteristic leaching procedure test; shall yield less than 0.2 mg of mercury per liter when tested according to NEMA LL 1.
- B. T8 Rapid-Start low-mercury Fluorescent Lamps: Rated 32 W maximum, nominal length 48 inches, 2800 initial lumens (minimum), CRI 75 (minimum), color temperature 3500 K, and average rated life 20,000 hours, unless otherwise indicated.
- C. Compact Fluorescent Lamps: 4-Pin, low mercury, CRI 80 (minimum), color temperature 3500 K, average rated life of 10,000 hours at 3 hours operation per start, unless otherwise indicated.
 - 1. 13 W: T4, double or triple tube, rated 900 initial lumens (minimum).
 - 2. 18 W: T4, double or triple tube, rated 1200 initial lumens (minimum).
 - 3. 26 W: T4, double or triple tube, rated 1800 initial lumens (minimum).
 - 4. 32 W: T4, triple tube, rated 2400 initial lumens (minimum).
 - 5. 42 W: T4, triple tube, rated 3200 initial lumens (minimum).

- D. Ceramic, Pulse-Start, Metal-Halide Lamps: Minimum CRI 80, and color temperature 4000 K.

2.6 LIGHTING FIXTURE SUPPORT COMPONENTS

- A. Comply with Division 16 Section "Electrical Supports and Seismic Restraints" for channel- and angle-iron supports and nonmetallic channel and angle supports.
- B. Single-Stem Hangers: 1/2-inch steel tubing with swivel ball fittings and ceiling canopy. Finish same as fixture.
- C. Wires: ASTM A 641/A 641M, Class 3, soft temper, zinc-coated steel, 12 gage.
- D. Wires for Humid Spaces: ASTM A 580/A 580M, Composition 302 or 304, annealed stainless steel, 12 gage.
- E. Rod Hangers: 3/16-inch minimum diameter, cadmium-plated, threaded steel rod.
- F. Hook Hangers: Integrated assembly matched to fixture and line voltage and equipped with threaded attachment, cord, and locking-type plug.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Lighting fixtures: Set level, plumb, and square with ceilings and walls. Install lamps in each fixture.
- B. Comply with NFPA 70 for minimum fixture supports.
- C. Suspended Lighting Fixture Support:
 - 1. Pendants and Rods: Where longer than 48 inches, brace to limit swinging.
 - 2. Stem-Mounted, Single-Unit Fixtures: Suspend with twin-stem hangers.
 - 3. Continuous Rows: Use tubing or stem for wiring at one point and tubing or rod for suspension for each unit length of fixture chassis, including one at each end.
- D. Air-Handling Lighting Fixtures: Install with dampers closed and ready for adjustment.
- E. Adjust aimable lighting fixtures to provide required light intensities.
- F. Connect wiring according to Division 16 Section "Conductors and Cables."

3.2 FIELD QUALITY CONTROL

- A. Test for Emergency Lighting: Interrupt power supply to demonstrate proper operation. Verify transfer from normal power to battery and retransfer to normal.

- B. Prepare a written report of tests, inspections, observations, and verifications indicating and interpreting results. If adjustments are made to lighting system, retest to demonstrate compliance with standards.

END OF SECTION 16511

SECTION 16740 - TELEPHONE, DATA, TV, AND SECURITY CONDUIT SYSTEMS

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Provide a system of properly sized and located outlets with associated connecting conduit runs, extending to pullboxes, and/or telephone backboards, where indicated. Provide raceways, or other provisions for new trunk cables throughout the project.
- B. Coordinate work with Owner's installer(s) of telephone outlets and wiring.

PART 2 - PRODUCTS

2.1 OUTLET BOXES

- A. Unless otherwise indicated, all outlets and junction boxes shall be 4-11/16" square steel with single gang box covers of depth required by wall construction.
- B. Floor boxes shall be adjustable type flush cover boxes as noted in Section BASIC MATERIALS AND METHODS.

2.2 OUTLET COVER PLATES

- A. Telephone outlet cover plates shall match those specified for adjacent wiring devices, including those with special finishes. Provide proper opening to match strap mounted receptacle(s), by others.

2.3 RACEWAYS

- A. Materials for raceway system work are specified in Section BASIC MATERIALS AND METHODS. Make installation as specified in that section.

2.4 BACKBOARDS

- A. Marine grade plywood (3/4"thick) finished in two coats of light grey marine enamel over a single compatible primer coat. Size as indicated on drawings.

2.5 PULL CORDS

- A. Equip all empty conduit with a nylon pull line from the furthest outlet to terminal board. Equip all trunk routes with similar pull lines. Tag both ends of each line with a permanent tag indicating location of other end. Minimum strength of pull line shall be 400 pounds.

2.6 SURGE PROTECTION

- A. Equip the entrance conductors with transient voltage surge suppression devices to provide a coordinated system of protection.
- B. Equip all other conductors entering the building from the exterior with surge suppression devices to provide a coordinated system of protection.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Verify location of wall outlets before roughing to insure coordination with the Owner's final intended furniture layout. Do not scale plans for location, unless directed. Where directed by Architect/Engineer before rough-in, relocation of outlets within rooms shall be at no additional cost to the Owner.
- B. Locate outlets and branch conduit runs concealed in structure and finishes. Conduit systems shall route outlets to backboard indicated. The raceway system shall be bonded to provide grounding of all metallic raceways. Use of trunk cable supports in lieu of raceway is permitted only where cabling will remain accessible after completion of project.
- C. Home run layout shall have job site approval of the Owner's designated representative. Coordinate work so that both Owner's representative and Architect/Engineer are present at the same time for approval of change in ample time for any required corrections before completion of project.
- D. Where not shown on drawings, route branch conduit to above nearest accessible ceiling and terminate with grounding bushing and identification tag. Conduits to terminal boards shall terminate within 1" of same with proper grounding bushing and be tagged for identification.
- E. Grounding bushings shall be bonded with #6 AWG stranded copper conductor to form a continuous grounded raceway system. Route ground conductor along cable route to terminal board.
- F. Provide pull boxes in conduit runs in each 100 foot run and for each two 90 degree bends. Locate pull boxes in accessible locations. Boxes are required whether shown or not.
- G. Conduit Sizing (whether not otherwise shown on drawings):
 - 1. Three-quarter inch minimum size. (#6 AWG ground, minimum)
 - 2. Office areas and miscellaneous outlets: for branch runs looping to a maximum of two outlets use three quarter inch size.
 - 3. Inside radius of bends in one inch trade size and larger shall be ten times nominal diameter.
- H. Bond all conduits to form a raceway system that is electrically continuous and properly grounded per N.E.C.

3.2 TERMINAL BOARDS

- A. Verify exact size requirements with installer before installation. Equip each board with two duplex receptacles. Where indicated, receptacles may be mounted through board. Where boards may be subject to condensation forming on the supporting wall, mount the board on 1/4" standoffs, as required by N.E.C.

3.3 GROUNDING

- A. At each terminal board location, provide an independent grounding conductor from the backboard to the main building ground. Minimum size conductor is #2/0 AWG copper in PVC conduit. Route conduit to insure minimum conductor length. Use conduit bends for changes of direction.
- B. Equip the terminal board with a ground bar of hard drawn copper at least 1/4" thick by 2" wide by 24" long, pre-drilled and tapped for ground lugs. Mount bar on FRP standoffs(2 minimum).

END OF SECTION 16740

