DFTG-1352 Structural Drafting

Trung Dao, Instructor

Introduction to Structural Drafting

Update: Jan 12-2013

OBJECTIVES

- Define structural drafting
- Indentify the different types of structural drawings
- List the most common employers of structural drafters
- Demonstrate proper structural drafting techniques in the areas of linework, lettering, and scale use
- Explain the use of CAD in structural drafting

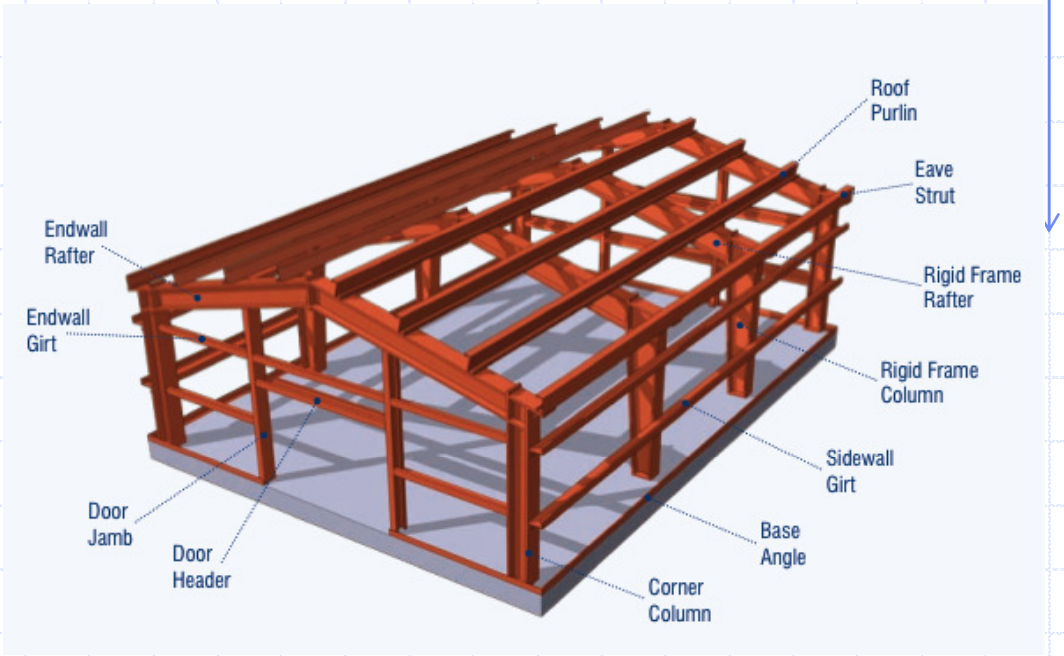
Structural Drafting Defined

→ In heavy construction, anything composed of parts is called ***a structural***

- Bridges, high rise buildings, buildings, towers, and countless other possibilities, are composed of parts, making them structures.

Example 1

- Industrial



Example 2

- High Rise Buildings

Example 3

- Retail Buildings

Types of Structural Drawings

→ Structural drafters are called upon to prepare two separate types of drawings: ***engineer drawings and shop drawings.***

* ***Engineer Drawings** are used to provide an overall pictures of a job for scales, marketing, estimating, or engineer proposes.*

* ***Shop Drawings** are much more detailed and used for designing, fabricating, manufacturing, and erecting the structural products that go into the job.*

Example

LIGHT GAUGE METAL FRAMING:

1. ALL LIGHT GAUGE METAL FRAMING INCLUDING METAL STUDS, METAL JOISTS, TRACK RUNNERS AND BRIDGING (STRAP OR OTHER) SHALL BE AS MANUFACTURED BY U.S.G. OR EQUAL. ALL SIZE GAUGES AND SPACES SHALL BE AS PER THE DRAWINGS.
2. PAINTED METAL STUDS SHALL BE PAINTED TO CONFORM TO ASTM A570 GRADE 50. GALVANIZED METAL STUDS SHALL CONFORM TO ASTM A446 GRADE D, 50 KSI YIELD. PAINTED METAL STUDS SHALL BE PAINTED TO CONFORM TO FEDERAL SPECIFICATION TT-P664. FIELD ABRASIONS TO MEMBERS DUE TO CUTTING OR WELDING SHALL BE TOUCHED UP WITH THE SAME WITH THE SAME GALVANIZED METAL STUDS SHALL BE FORMED FROM STEEL HAVING A G-60 GALVANIZE COATING. FIELD ABRASIONS TO MEMBERS DUE TO CUTTING OR WELDING SHALL BE BE REPAIRED WITH COLD GALVANIZING COMPOUND PER MANUFACTURES SPECIFICATIONS.
3. PROVIDE HORIZONTAL BRIDGING AND PURLIN CONNECTION AS SUGGESTED BY MBMA.
4. PROVIDE 16 GAUGE CONTINUOUS TRACK AT ENDS OF STUDS. STUDS SHALL BE SEATED SQUARELY IN TRACK.
5. UNLESS NOTED OTHERWISE, PROVIDE 2-NO. 12 SCREWS OR 1/8" FILLET WELDS, 2 INCHES LONG FOR STUD TO STUD OR STUD TO TRACK CONNECTIONS.
6. STUD OR TRACK ATTACHMENTS TO STRUCTURAL STEEL SHALL BE ACCOMPLISHED BY FUSION WELDING 1" EACH SIDE OF STUD/TRACK AT EACH SUPPORT AND CONNECTION.
7. FUSION WELDING OF STUDS SHALL CONFORM TO ASTM E80.
8. WALLS VERTICAL STUD SHALL BE 600CSW16 BY UNIMAST INCORPORATED OR APPROVED EQUAL WITH THE FOLLOWING TYPE, GAGE, AND PHYSICAL PROPERTIES. U.N.O. ON DWGS.

WALL STUDS	GAGE:	18
	MOMENT OF INERTIA:	3.129 IN ^{4}/FT
	SECTION MODULUS:	1.022 IN ^{3}/FT
	MINIMUM DEPTHS:	6 IN (NOMINAL)

CONCRETE MASONRY NOTES:

1. ALL CONRETE MASONY UNITS SHALL BE ASTM C- 90 GRADE N TYPE1 , SAND AND GRAVEL AGGREGATE Fm'= 1,600psi.
2. ALL MORTAR SHALL BE ASTM C-270 TYPE S MORTAR, CONSISTING OF PORTLAND CEMENT, LIME ANS FINE AGGREGATE.
3. PORTLAND CEMENT SHALL CONFORM TO ASTM C- 150. AGGREGATE SHALL CONFORM TO ASTM C-144. HYDRATED LIME SHALL CONFORM TO ASTM C- 207
4. NO CALCIUM CHLORIDE OR FLY ASH SHALL BE PERMITTED IN MORTAR MIX.
5. VERTICAL CELLS SHOWN ON PLANS OR IN SECTION AS SOLID SHALL HAVE A VERTICAL ALIGNMENT TO MAINTAIN A CLEAR, UNOBSTRUCTED, CONTINUOUS VERTICAL CELL , MEASURING NOT LESS THAN 2" X 3"
6. ALL CELLS CONTAINING REINFORCEMENT SHALL BE FILLED SOLIDLY WITH 3000 PSI GROUT OR CONCRETE. THE MAXIMUM AGGREGATE SIZE FOR GROUTING SHALL BE 3/8".
7. ALL REINFORCEMENT STEEL BARS SHALL BE IN PLACE PRIOR TO GROUTING.
8. ALL SPLICE IN REINFORCEMENT BARS SHALL LAP A MINIMUM OF 30 BAR DIAMETER.

STEEL DECK :

1. DESIGN, FABRICATION AND ERECTION OF METAL DECK SHALL BE CONFORM TO THE STEEL DECK INSTITUTE "CODE OF RECOMMENDED STANDARD PRACTICE AND BASIC DESIGN SPECIFICATION", LATEST EDITION.
2. WELDED MATERIALS AND PROCEDURES SHAL BE MADE TO ENSURE AGAINST BURNING OF HOLES IN THE DECK. WELDS SHALL CONFORM TO THE FOLLOWING PATTERNS USING STANDARD WELDED WASHERS, WHERE REQUIRED, AT SUPPORTING MEMBERS.
   A. WELD AT EACH SIDE LAP AND TWO EVENLY SPACED AT PANEL SEAMS. CORRIGATIONS BETWEEN SIDE LAPS AT INTERMEDIATE SUPPORTS.
   B. WELD AT 12" MAX. AT THE PERIMETER.
   C. #12" TEK FASTENERSAT 1/3 POINTS OF DECK SPAN AT PANEL SEAMS.

ROOF DECK	GAGE:	22
	MOMENT OF INERTIA:	0.12 IN 4/FT.
	SECTION MODULUS:	1.111 IN 3/FT.
	MINIMUM DEPTHS:	1 1/2 INCH (NOMINAL)
	USE "VULCRAFT 1.5F22 OR APPROVED EQUAL.	

3. MAJOR OPENINGS ARE SHOWN ON THE DRAWINGS. ALL OPENINGS LARGER THAN 12" SQUARE OR ROUND, SHALL HAVE STRUCTURAL STEEL FRAMING AROUND OPENINGS FOR DECK SUPPORT.

GENERAL CONCRETE NOTES:

DESIGN LOADS (IBC 2000)

1. LIVE LOADS ROOF 20PSF
   CEILING PURLINS 3 PSF
   FLOOR 100 PSF
2. WIND LOADS BASIC WIND DESIGN VELOCITY 110 MPH WITH 3 SECONDS GUST. EXPOSURE B IMPORTANCE FACTOR 1
3. ALL CONCRETE REINFORCING BARS SHALL CONFORM TO ASTM, GRADE 60. NO. 3 BARS MAY CONFORM TO ASTM A615, GRADE 40.
4. CONCRETE SHALL BE REGULAR WEIGHT, SAND AND GRAVEL AGGREGATE , WITH TYPE 1 PORTLAND CEMENT . 5 SACK MIX, DESIGNATED MINIMUM COMPRESSIVE (F'C) OF 3000 PSI IN 28 DAYS.
5. ALL MIXING , TRANSPORTING , PLACING AND CURING OF CONCRETE SHALL BE IN ACCORDANCE WITH THE RECOMMENDATIONS OF AMERICAN CONCRETE INSTITUTE.
6. CONCRETE COVERING PROTECTION OF THE REINFORCEMENT BARS SHALL BE :
   DRILLED FOOTING .....3" SIDES & BOTTOM
   SLAB ON GRADE ..... 1" FROM TOP
   GRADE BEAM ..... 1 1/2" TOP , BOTTOM ;3" SIDES 1 1/2"
   THERE SHALL BE NO HORIZONTAL CONSTRUCTION JOINTS IN GRADE BEAM OTHER THAN CONSTRUCTION JOINTS SHALL BE MADE IN QUARTER SPANS BETWEEN FOOTING WITH VERTICAL BULKHEADS .
7. LAP CONTINUOUS UNSCHEDULED REINFORCING BARS AS FOLLOWS : BOTTOM BARS IN MEMBERS SUPPORTED BY FOOTING AT LOCATIONS -12" . TOP BARS SHALL BE LAP AT OR NEAR MID SPAN. LAP SHALL BE 50 BAR DIAMETERS.
8. GROUT UNDER THE BASE PLATES SHALL BE NON SHRINKING TYPE WITH MINIMUM COMPRESSIVE STRENGTH OF 6000 PSI IN 28 DAYS.
9. DETAILING AND PLACING OF CONCRETE REINFORCEMENT BARS AND ITS ACCESSORIES SHALL BE IN ACCORDANCE WITH ACI 315 LATEST EDITION.
10. ALL CONFLICT OR OMISSIONS BETWEEN DRAWING , NOTE , SOIL REPORT AND SITE CONDITIONS SHALL BE IMMDIATELY BROUGHT TO THE ATTENTION OF THE ENGINEER . FAILURE TO DO SO WILL OBLIGATE THE CONTRACTOR TO ANY JOB EXPENSE ARISING DUE ANY ERRORS THAT MAY OCCUR HEREON.

FILL & SUBGRADE PREPARATION

1. THE SITE SHOULD BE STRIPPED TO SUITABLE DEPTH TO REMOVE TOP SOIL, AS PER GEOTECHNICAL REPORT.
2. THE NATURAL SUBGRADE SHOULD BE SCARIFIED TO A MIN. DEPTH OF 6 IN. THE SCARIFIED SOIL SHOULD BE RECOMPACTED TO A MIN. 95% OF THE MAX. DRY DENSITY. THE MOISTURE CONTENT SHALL RANGE 1 TO 3% OF OPTIMUM MOISTURE.
3. SELECT FILL SHOULD CONSIST OF A CLEAN SANDY CLAY WITH LL LESS THAN 35 AND PI BETWEEN 10 & 20.
4. SELECT FILL SHOULD BE PLACED IN 4'-9 IN. LOOSE LIFTS AND COMPACTED TO 95% OF MAX. DRY DENSITY AS PER ASTM D698. (TOTAL 24" SELECT FILL COMPACTED)
5. A BEDDING LAYER OF LEVELING SAND OF 2" MAY BE PLACED UNDER THE FLOOR SLAB. VAPOR BARRIER OF 6 MIL SHEETING SHOULD BE PLACED OVER SAND.
6. SLAB ON GRADE SHALL BE PLACED ON SELECT FILL. REFER TO GEOTECHNICAL REPORT #04-0581 BY GESSNER ENGINEERING , COLLEGE STATION, TX. FOR STRUCTURAL FILL & SUBGRADE PREPARATION. THE EXISTING SUBGRADE AND ADDITIONAL FILL SHALL BE COMPACTED TO A MINIMUM OF NINETY- FIVE PERCENT (95%) OF ITS MAXIMUM DENSITY AS DETERMINED BY THE STANDARD PROCTOR COMPACTION TEST, BY ASTM D-698 PROCEDURE. COVER THE PREPARED GRADE WITH 6 MIL POLYETHYLENE SHEETING. ADDITIONAL FILL MATERIALS SHALL BE SILTY OR SANDY CLAY HAVING A PLASTICITY INDEX (P.I.) OF 10 TO 20 AND A LIQUID LIMIT OF 28 OR MORE. FILL MATERIALS SHALL BE PLACED IN SIX TO EIGHT INCH LOOSE LIFTS.
7. ALL FOOTINGS ARE TO BEAR ON FIRM AND CLEAN SOIL. THE SOIL BEARING AT ALL FOOTING SHALL BE VERIFIED BY AN ACCEPTED METHOD. THE MINIMUM SOIL BEARING PRESSURE FOR THIS PROJECT IS 9,000 PSF FOR TOTAL AND 6,000 PSF FOR DEAD LOAD PLUS SUSTAINED LIVE LOAD. DRILLED FOOTING SHALL BE POURED IMMEDIATELY AFTER DRILLING.

STRUCTURAL AND MISCELLANEOUS STEEL

1. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY ALL DIMENSION, ELEVATION AND REVIEW THESE DRAWINGS BEFORE FABRICATION OR ORDERING MATERIALS.
2. ALL STRUCTURAL & MISC. SHAPES SHALL BE ASTM A-50.
3. ALL DETAILING SHAL BE IN CONFORMANCE WITH THE STANDARDS OF THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC).
4. UNLESS NOTED OTHERWISE, PROVIDE FRAMED BEAM CONNECTIONS IN ACCORDANCE WITH PART 4, AISC MANUAL – 3/4" ASTM A-325 BOLTS. DESIGN FOR SHEARS IN TABLES FOR ALLOWABLE LOADS ON BEAMS, PART 2.
5. FIELD CONNECTIONS SHALL BE EQUIVALENT TO STARDARD BOLTED CONNECTIONS USING 3/4" ASTM A-325 BOLTS UNLESS OTHERWISE SHOWN. IF CONNECTION BOLT ARE IN SINGLE SHEAR BOLTS SHALL BE PLACED IN ONE VERTICAL ROWS. CONNECTION SHALL BOLTED OR WELDED. – SEE DETAILS.
6. WELDING SHALL CONFORM TO THE "CODE OF WELDING IN BUILDING CONSTRUCTION" BY THE AMERICAN WELDING SOCIETY, LATEST EDITION. WELDS NOT CALLED OUT ON DRAWINGS SHALL BE 3/16" CONTINOUS FILLET WELDS. WELDING ELECTRODES SHALL CONFORM TO AWS A5.1 OR A5.5 E70XX.
7. ANCHOR BOLTS SHALL CONFORM TO ASTM A-325 FOR HEADED A.B. AND SHALL BE SET USING RIGID TEMPLATES.

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CHIVINA EXPRESS
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Date: 03/01/2009
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Checked By: DN
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- Design Design
- Design Development
- Const. Doc. 08/07/2010

Revisions:
- Schematic Pricing
- Check Set 06/05/2009
- Pricing Set
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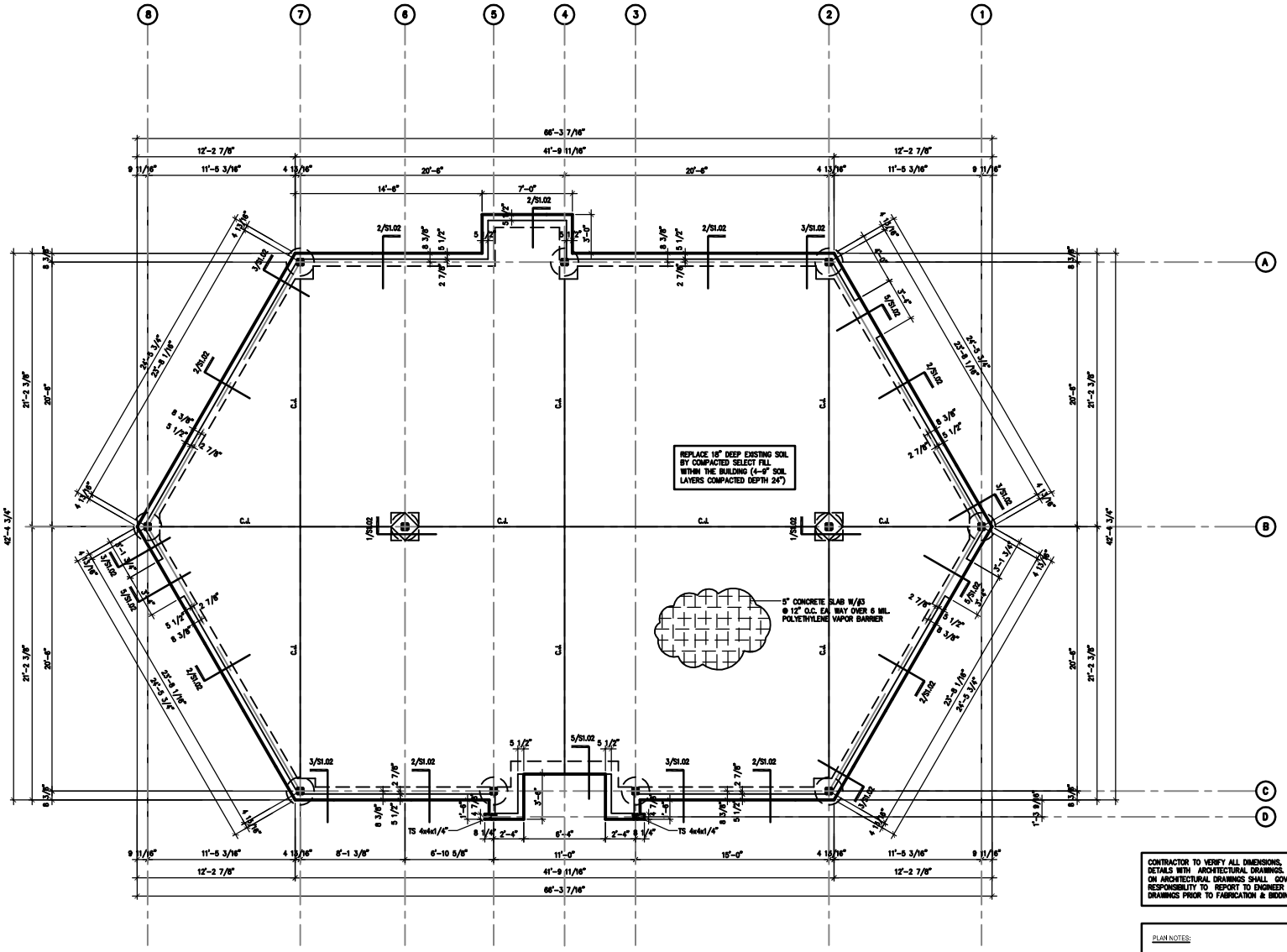
GENERAL NOTES

SHEET
S0.01



CONTRACTOR TO VERIFY ALL DIMENSIONS, ELEVATIONS, AND COORDINATE DETAILS WITH ARCHITECTURAL DRAWINGS. ALL DIMENSIONS & ELEVATION ON ARCHITECTURAL DRAWINGS SHALL GOVERN. IT IS CONTRACTOR'S RESPONSIBILITY TO REPORT TO ENGINEER ABOUT DISCREPANCY IN DRAWINGS PRIOR TO FABRICATION & BIDDING.

PLAN NOTES:

1. ALL FOOTING ARE 14/42 UNLESS NOTED ON PLAN.
2. ALL COLUMNS ARE TS 5x5x1/4 U.N.O.
3. C.J. ON PLAN INDICATES CONTROL JOINT.
4. REPLACE EXISTING SOIL WITHIN BUILDING AS RECOMENDED BY GEOTECHNICAL REPORT.
5. SITE SHOULD BE GRADED TO SHED ALL RAIN WATER AWAY FROM STRUCTURE. NO WATER POND ALLOWED AROUND BUILDING.
6. SOIL REPORT NO. 004--0098, DATED DECEMBER 21, 2004 BY GESSNER ENGINEERING TEXAS, IS A PART OF THE CONSTRUCTION DOCUMENTS. IT IS CONTRACTOR'S RESPONSIBILITY TO REVIEW THIS REPORT FOR SITE PREPARATION AND DRILLED SHAFTS. IN CASE SAND IS ENCOUNTERED AT SITE, CASING MUST BE USED FOR DRILLED SHAFTS INSTALLATION.

FOUNDATION PLAN | 1/4"=1'-0" | 1

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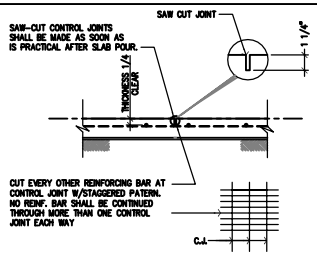
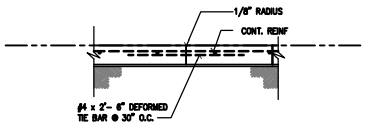
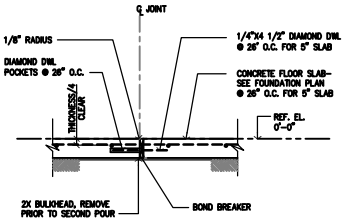
SHEET
S1.01



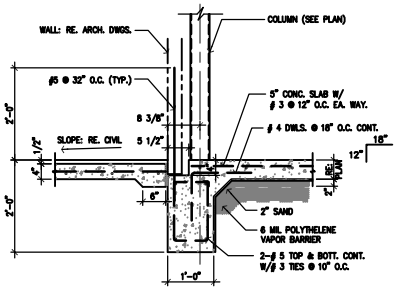
TYP. ISOLATION JOINT | 3/4" = 1'-0" | 13



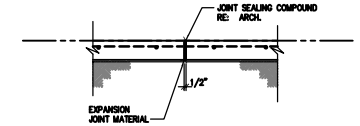
BONED CONST. JOINT | 3/4" = 1'-0" | 10



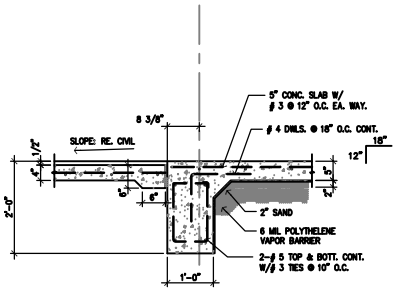
TYP. CONST. JOINT | 3/4" = 1'-0" | 6



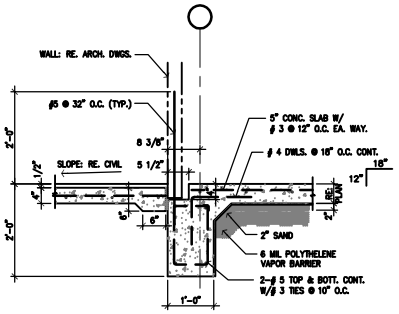
SECTION DETAIL | 3/4" = 1'-0" | 3



TYP. ISOLATION JOINT | 3/4" = 1'-0" | 9

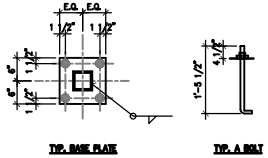


SECTION DETAIL | 3/4" = 1'-0" | 5



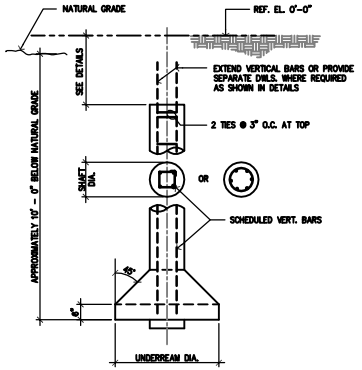
SECTION DETAIL | 3/4" = 1'-0" | 2

3/4" = 1'-0" | 12



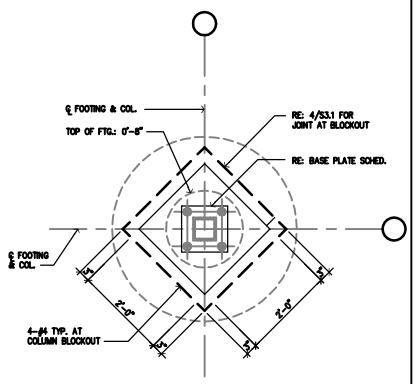
BASE PLATE SCHEDULE	
COLUMN SIZE	BASE PLATE SIZE
TS 4x4	PLATE 3/4"x10"x0'-10"
TS 5x5	PLATE 3/4"x11"x0'-11"

TYP. BASE PLATE & ANCHOR BOLT | 3/4" = 1'-0" | 11

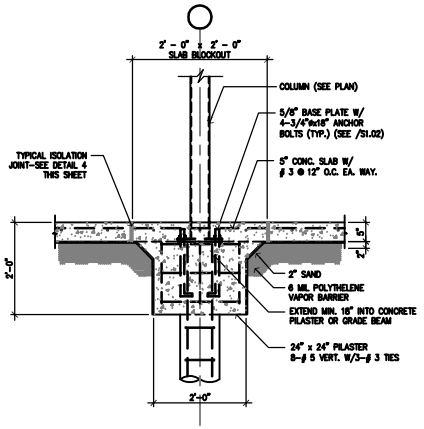


FOOT SCHEDULE		
SHAFT	VERT.REINT.	TIES
12" ø	4 - #4	#3 @ 12" O.C.
14" ø	5 - #4	#3 @ 12" O.C.

TYP. DRILLED PIER DETAIL | 3/4" = 1'-0" | 7



TYP. COLUMN BLOCK OUT | 3/4" = 1'-0" | 4



SECTION DETAIL | 3/4" = 1'-0" | 1

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FOUNDATION DETAILS

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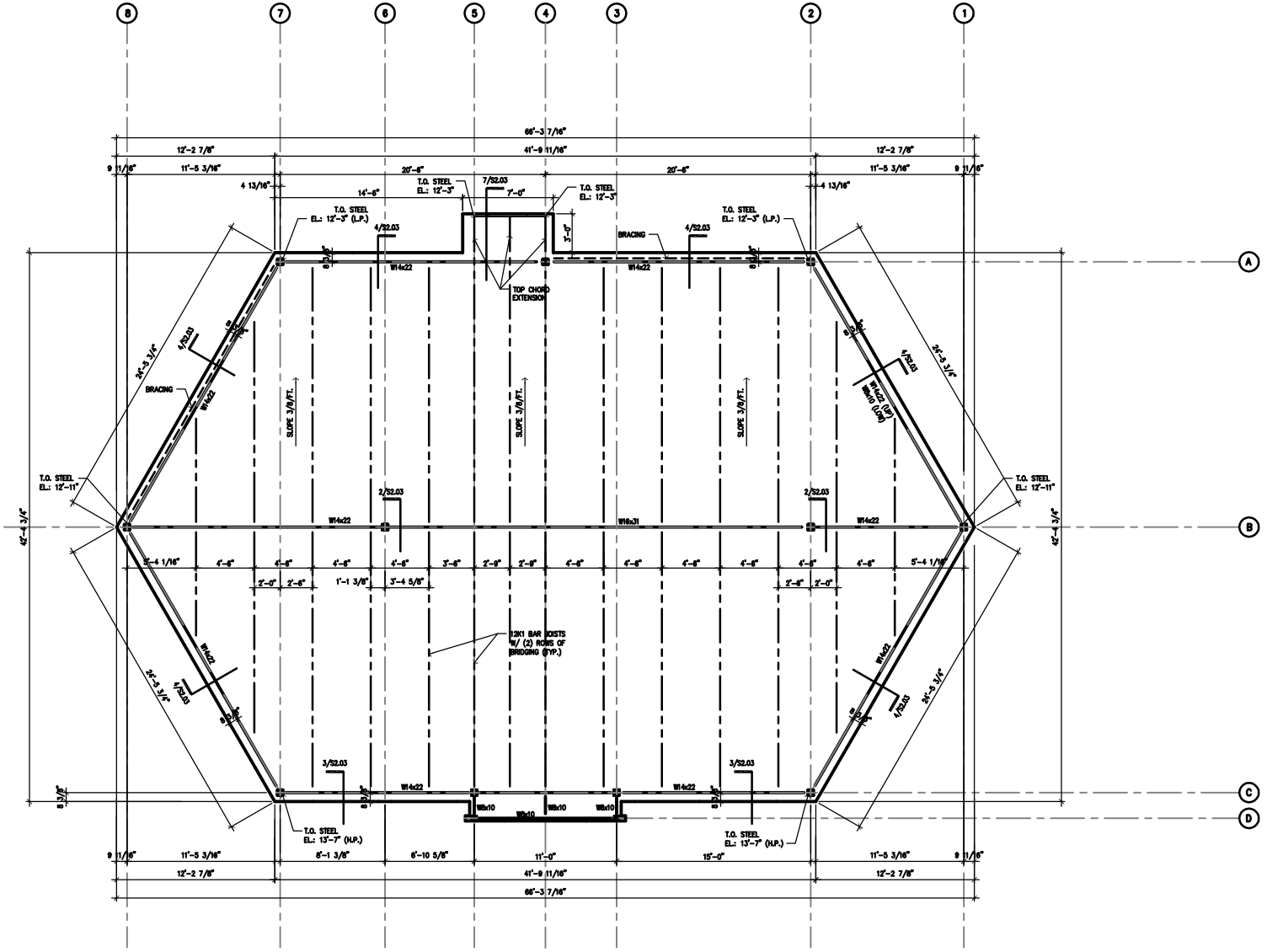
S1.02



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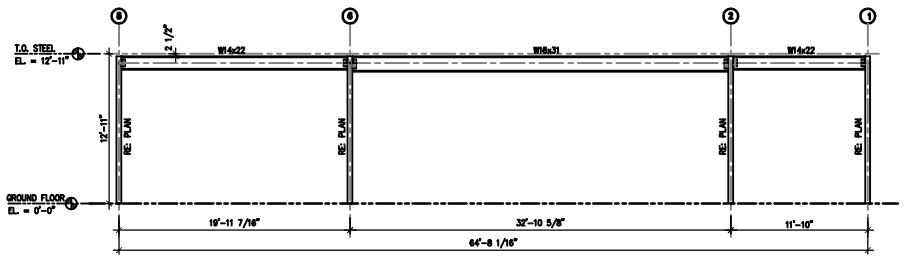
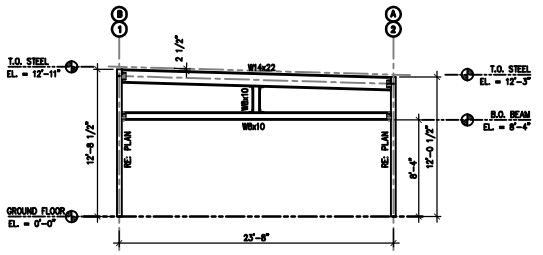
ROOF FRAMING PLAN

SHEET
S2.01

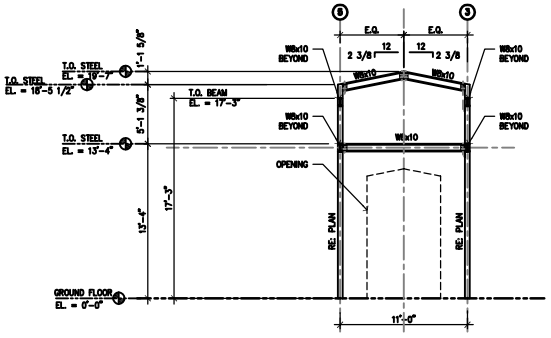
ROOF FRAMING PLAN | 1/4"=1'-0" | 1



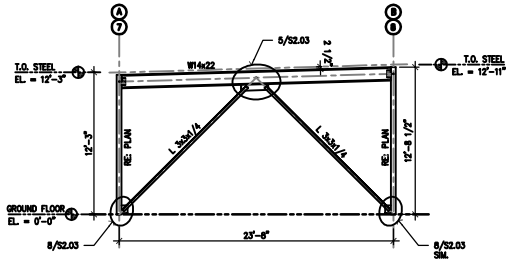
ELEV. ALONG COL. LINE B | 3/16" = 1'-0" | 6



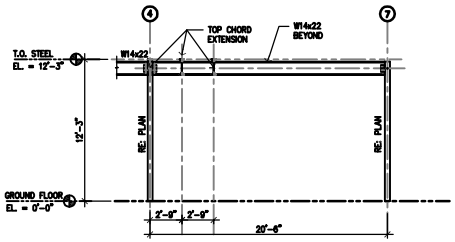
ELEV. ALONG COL. LINE | 3/16" = 1'-0" | 3



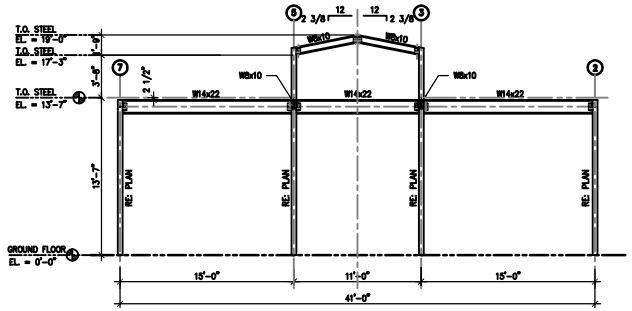
ELEV. ALONG COL. LINE D | 3/16" = 1'-0" | 5



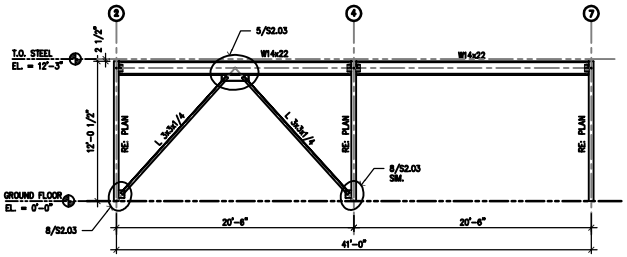
ELEV. ALONG COL. LINE | 3/16" = 1'-0" | 2



ELEV. BETWEEN COL. LINE 4&5 | 3/16" = 1'-0" | 7



ELEV. ALONG COL. LINE C | 3/16" = 1'-0" | 4



ELEV. ALONG COL. LINE A | 3/16" = 1'-0" | 1

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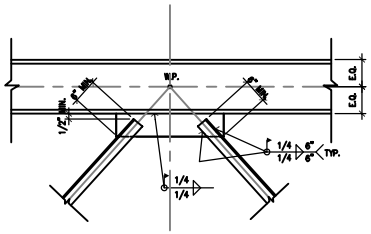
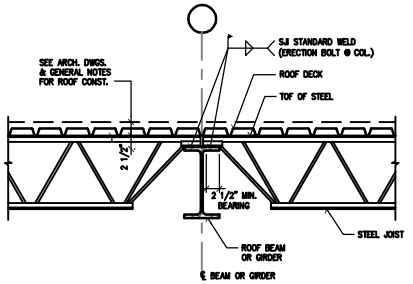
LICENSED PROFESSIONAL ENGINEER
08/07/2010

FRAMING ELEVATIONS

SHEET
S2.02

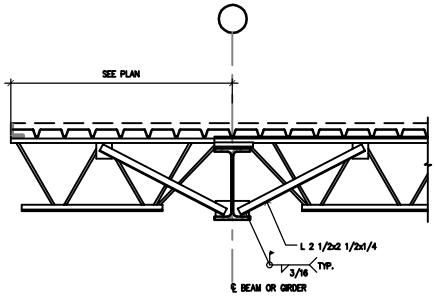


TYP. DETAIL | NTS | 5

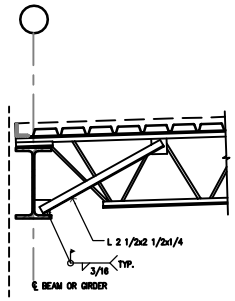


OPEN WEB STEEL JOIST AT
INTERIOR STEEL BEAM,
ROOF (ROOF DECK)

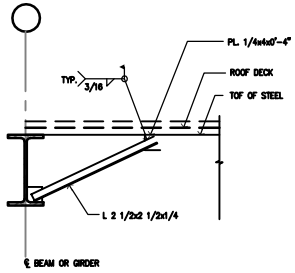
TYP. DETAIL | NTS | 2

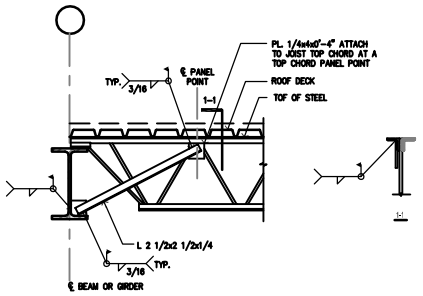


TYP. DETAIL | NTS | 7



TYP. DETAIL | NTS | 4



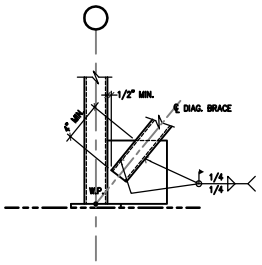


BEAM BOTTOM FLANGE BRACE
(STEEL JOIST CONST.)

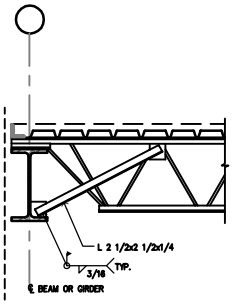
NOTES:

1. SEE PLAN FOR LOCATIONS OF ANGLE BRACES
2. FIELD WELDING OF 1/4" CONNECTION PLATES SHALL BE AT FABRICATION'S OPTION
3. ALL BRACINGS SHALL BE IN PLACE AND WELDED BEFORE DECK INSTALLATION
4. BRACES SIZES SHOW ARE TYPICAL UNLESS OTHERWISE NOTES ON PLAN
5. SEE GENERAL NOTES FOR DECK CONSTRUCTION

TYP. DETAIL | NTS | 1



TYP. DETAIL | NTS | 6



TYP. DETAIL | NTS | 3

SOUTH TEXAS DESIGN BUILD, LLC
16100 Cairnway, Suite 362
Houston, TX 77084
Tel: 281.596.9576
Fax: 281.817.5848
info@stxdebuild.com

STDB

CHIVINA EXPRESS
1990 West State Hwy. 71
La Grange, Texas 78945

Date: 03/01/2009
Job Number: 09-034
Drawn By: TD, DT, NH
Checked By: DN
○ Schematic Design
○ Design Development
● Const. Doc. 08/07/2010

Revisions:
○ Schematic Pricing
○ Check Set 06/05/2009
○ Pricing Set
● Permit Set 08/07/2010
○ Record Set

STATE OF TEXAS
REGISTERED
AHMAD S. ALAYYUBI
85368
LICENSED
PROFESSIONAL ENGINEER
08/07/2010

FRAMING
DETAILS

SHEET
S2.03

GENERAL NOTES

1.1 Fabrication shall be in accordance with R.G.B. standard practices in compliance with the applicable sections, relating to design requirements and allowable stresses of the latest edition of the "AWS Structural Welding Code D1.1 and D1.3". R.G.B. manufacturing procedures are certified by:

Reference	Certification numbers
Houston	R.G.B. #456

1.2 MATERIALS

	ASTM DESIGNATION	MIN. YIELD STRENGTH
Hot Rolled Steel Shapes (W, S, C & L)	A572	Fy = 50 KSI
Steel Pipes	A500	Fy = 42 KSI
Structural Tubing	A500	Fy = 46 KSI
Structural Steel Web Plate	A572/A1011	Fy = 55 KSI
Structural Steel Flange Plates/Bars	A529/A572	Fy = 55 KSI
Cold Formed Light Gage	A653/A1011	Fy = 50, 55 KSI
Roof and Wall Sheets	A792/A653	Fy = 50, 80 KSI
Cable Brace	A475 – TYPE 1	Extra High Strength
Rod Brace	A36	Fy = 36 KSI
		MIN. TENSILE STRENGTH
Machine Bolts & Nuts	A307	Fu = 60 KSI
High Strength Bolts (1"ø and less)	A325–TYPE 1	Fu = 120 KSI
High Strength Bolts (>1"ø to 1 1/2"ø)	A325–TYPE 1	Fu = 105 KSI
Anchor Bolts (if supplied)	A36/A307/F1554	Fu = 60 KSI

1.3 PRIMER
Shop primer paint is a rust inhibitive primer which meets the end performance of Federal Specification SSPC No. 15 and is R.G.B. Red Oxide color. This paint is not intended for long term exposure to the elements. R.G.B. is not responsible for any deterioration of the shop primer paint as a result of improper handling and/or jobsite storage. R.G.B. shall not be responsible for any field applied paint and/or coatings. (Section 6.5 AISC Code of Standard Practice, 9th Edition). Nominal thickness of primer will be 1 mil unless otherwise specified in contract documents.

1.4 GALVANIZED OR SPECIAL COATINGS:
See Contract Documents

1.5 ALL BOLTS ARE 1/2"ø x 0'–1" A307 EXCEPT :
a) Eave strut connection – 1/2"ø x 0'–1 1/4" A307
b) Endwall rafter splice – 5/8"ø x 0'–1 3/4" A325–N
c) Endwall column to rafter connection – 1/2"ø x 0'–1 1/4" A325–N
d) Main frame connections – SEE CROSS SECTION

NOTE: Washers are not supplied unless noted otherwise on drawing

1.6 A325 BOLT TIGHTENING REQUIREMENTS

All high strength bolts are A325–N unless specifically noted otherwise.

Structural bolts shall be tightened by the turn–of–the–nut method in accordance with the 9th Edition AISC "Specification For Structural Joints " using ASTM A325 or A490 Bolts, when specifically required. A325–N bolts are supplied without washer unless otherwise noted on the drawings.

All bolted connections unless noted are designed as bearing type connections with bolt threads not excluded from the shear plane.

1.7 CLOSURE STRIPS ARE FURNISHED FOR APPLICATION:
INSIDE – Under roof panels at eave
OUTSIDE – Between endwall panels and rake trim
– Under continuous ridge vent skirts

1.8 ERECTION NOTE:
All bracing, strapping, & bridging shown and provided by R.G.B. for this building is required and shall be installed by the erector as a permanent part of the structure. If additional bracing is required for stability during erection, it shall be the erector's responsibility to determine the amount of such bracing and to procure and install as needed.

1.9 ERECTION AND UNLOADING NOT BY R.G.B.

1.10 SHORTAGES
Any claims or shortages by buyer must be made to R.G.B. within five (5) working days after delivery, or such claims will be considered to have been waived by the customer and disallowed.

1.11 CORRECTIONS OF ERRORS AND REPAIRS (MBMA 6.10)
Claims for correction of alleged misfits will be disallowed unless R.G.B. shall have received prior notice thereof and allowed reasonable inspection of such misfits. The correction of minor misfits by the use of drift pins to draw the components into line, moderate amounts of reaming, chipping and cutting, and the replacement of minor shortages of material are a normal part of erection and are not subject to claim. No part of the Building may be returned for alleged misfits without the prior approval of R.G.B.

BUYER/END USE CUSTOMER RESPONSIBILITIES

2.1 It is the responsibility of the BUYER/END USE CUSTOMER to obtain appropriate approvals and secure necessary permits from City, County, State, or Federal Agencies as required, and to advise/release R.G.B. to fabricate upon receiving such.

2.2 Rigid Global Buildings (hereafter referred to as R.G.B.) standard specifications apply unless stipulated otherwise in the Contract Documents. R.G.B. design, fabrication, quality criteria, standards, practice, methods and tolerances shall govern the work with any other interpretations to the contrary notwithstanding. It is understood by both Parties that the BUYER/END USE CUSTOMER is responsible for clarification of inclusions or exclusions from the architectural plans and/or specifications.

2.3 In case of discrepancies between R.G.B. structural steel plans and plans for other trades, R.G.B. plans shall govern. (Section. 3 AISC Code of Standard Practices, 9th Edition)

2.4 Approval of R.G.B. drawings and calculations indicates that R.G.B. has correctly interpreted and applied the Contract Documents. This approval constitutes the contractor/owners acceptance of the R.G.B. design concepts, assumptions, and loading. (Section 4 AISC Code and MBMA 3.3.3)

2.5 Once the BUYER/END USE CUSTOMER has signed R.G.B. Approval Package and the project is released for fabrication, changes shall be billed to the BUYER/END USE CUSTOMER including material, engineering and other costs. An additional fee may be charged if the project must be moved from the fabrication and shipping schedule.

RIGID GLOBAL BUILDINGS

DRAWING PACKAGE

SALES NO.	41153	JOB NO.	98744	BLDG.	A (Main)
CUSTOMER	South Texas Design Build LLC				
END USER	Thuy Le				
END USE	Garage				
STREET	23255 Fairlake Dr.				
CITY,ST,ZIP	Huffman, TX 77336				
COUNTY	Harris				

THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH THE FOLLOWING AS INDICATED:

DESIGN LOADS:

Design Code	: IBC 09		
Enclosure	: Closed		
Dead Load (psf)	: Metal building structure only by RGB		
Collateral Load (psf)	: 0		
Wind Load			
Basic Wind Speed	: 110 mph		
Wind Importance Factor, Iw	: 1.00		
Wind Exposure	: B		
Live Load	:		
Primary Framing (psf)	: 20.00		
Trib. Area Reduction	: Yes		
Secondary Framing (psf)	: 20.00		
Snow Load			
Ground Snow Load, Pg (psf)	: 0 psf		
Roof Snow Load, Pf (psf)	: 0		
Snow Exposure Factor, Ce	: 1		
Snow Importance Factor, Is	: 1		
Thermal Factor Ct	: 1		
Seismic Load			
Seismic Importance Factor Ie	: 1		
Site Class	: D		
Mapped Spectral Response Acceleration	: Ss=0.092	S1=0.039	
Spectral Response Coefficient	: Sds=0.098	Sd1=0.062	
Seismic Design Category	: A		

Other Loads/Requirements

BUILDING DESCRIPTION:

Width (ft)	: 19.75
Length (ft)	: 49.75
Eave Ht. at BSW (ft)	: 14
Eave Ht. at FSW (ft)	: 14
Roof Slope at BSW	: 1.0:12
Roof Slope at FSW	: 1.0:12
Bay Spacing (ft)	: 2 at 24.88

COVERING AND TRIMS:

Roof Panels & Trims	
Panel Type	: 26 Ga. PBR
Panel Color	: Spec 2000 CRIMSON RED
Trim Colors	
Eave Trim	: Spec 2000 CRIMSON RED
Eave Gutter	: Spec 2000 CRIMSON RED
Gable Trim	: Spec 2000 CRIMSON RED
Wall Panel & Trims	
Panel Type	: 26 Ga. PBR
Panel Color	: Spec 2000 FERN GREEN
Trim Colors	
Corner Trims	: Spec 2000 CRIMSON RED
Opening Trims	: Spec 2000 CRIMSON RED
Downspouts	: Spec 2000 CRIMSON RED
Base Trim	: N/A
Mas. Flash	: N/A
Special Requirements	: NONE

2.6 The BUYER/END USE CUSTOMER is responsible for overall project coordination. All interface, compatibility, and design considerations concerning any materials not furnished by R.G.B. and R.G.B. steel system are to be considered and coordinated by the BUYER/END USE CUSTOMER. Specific design criteria concerning this interface between materials must be furnished before release for fabrication or R.G.B. assumptions will govern (Section 4 and Commentary, AISC Code of Standard Practice, 9th Edition)

2.7 It is the responsibility of the BUYER/END USE CUSTOMER to insure that R.G.B. plans comply with the applicable requirements of any governing building authorities. The supplying of sealed engineering data and drawings for the metal building system does not imply or constitute an agreement that R.G.B. or its design engineers are acting as the engineer of record or design professional for a construction project. These drawings are sealed only to certify the design of the structural components furnished by R.G.B.

2.8 The BUYER/END USE CUSTOMER is responsible for setting of anchor bolts and erection of steel in accordance with R.G.B. "For Construction" drawings only. Temporary supports such as guys, braces, falsework, cribbing or other elements required for the erection operation shall be determined furnished and installed by the erector. No items should be purchased from a preliminary set of drawings, including anchor bolts. Use only final "FOR CONSTRUCTION DRAWINGS" for this use. (Section 7 AISC Code of Standard Practice, 9th Edition.)

2.9 Rigid Global Buildings is responsible for the design of the anchor bolt to permit the transfer of forces between the base plate and the anchor bolt in shear, bearing and tension, but is not responsible for the transfer of anchor bolt forces to the concrete or the adequacy of the anchor bolt in relation to the concrete.
Unless otherwise provided in the Order Documents, R.G.B. does not design and is not responsible for the design, material and construction of the foundation or foundation embedments. The END USE CUSTOMER should assure himself that adequate provisions are made in the foundation design for loads imposed by column reactions of the building, other imposed loads, and bearing capacity of the soil and other conditions of the building site.
It is recommended that the anchorage and foundation of the building be designed by a Registered Professional Engineer experienced in the design of such structures. (Section A10 1986 MBMA Low Rise Building Systems Manual)

2.10 Normal erection operations include the corrections of minor misfits by moderate amounts of reaming, chipping, welding or cutting, and the drawing of elements into line through the use of drift pins. Errors which cannot be corrected by the foregoing means or which require major changes in member configuration are to be reported immediately to R.G.B. by the BUYER/END USE CUSTOMER, to enable whoever is responsible either to correct the error or to approve the most efficient and economic method of correction to be used by others. (Section 7 AISC Code of Standard Practice, 9th Edition)

2.11 Neither the fabricator nor the BUYER/END USE CUSTOMER will cut, drill or otherwise alter his work, or the work of other trades, to accommodate other trades, unless such work is clearly specified in the contract documents. Whenever such work is specified, the BUYER/END USE CUSTOMER is responsible for furnishing complete information as to materials, size, location and number of alterations prior to preparation of shop drawings. (Section 7 AISC Code of Standard Practice, 9th Edition)

2.12 WARNING In no case should Galvalume steel panels be used in conjunction with lead or copper. Both lead and copper have harmful corrosive effects on the Galvalume alloy coating when they are in contact with Galvalume steel panels. Even run–off from copper flashing, wiring, or tubing onto Galvalume should be avoided.

2.13 SAFETY COMMITMENT Rigid Global Buildings has a commitment to manufacture quality building components that can be safely erected. However, the safety commitment and job site practices of the erector are beyond the control of R.G.B.
It is strongly recommended that safe working conditions and accident prevention practices be the top priority of any job site. Local, State, and Federal safety and health standards should always be followed to help insure workers safety. Make certain all employees know the safest and most productive way of erecting a building. Emergency procedures should be known to all employees.
Daily meetings highlighting safety procedures are also recommended. The use of hard hats, rubber sole shoes for roof work, proper equipment for handling material, and safety nets where applicable, are recommended.

2.14 Roof drainage systems (gutter, downspouts, etc.) must be free of any obstruction to ensure smooth operation at any given time.

2.15 It is recommended by Factory Mutual (Reference: B2.44) that roofs be cleared of snow when half of the maximum snow depth is reached. The maximum snow depth can be estimated based on the design snow load and the density of snow and/or ice buildup. See Chart below.

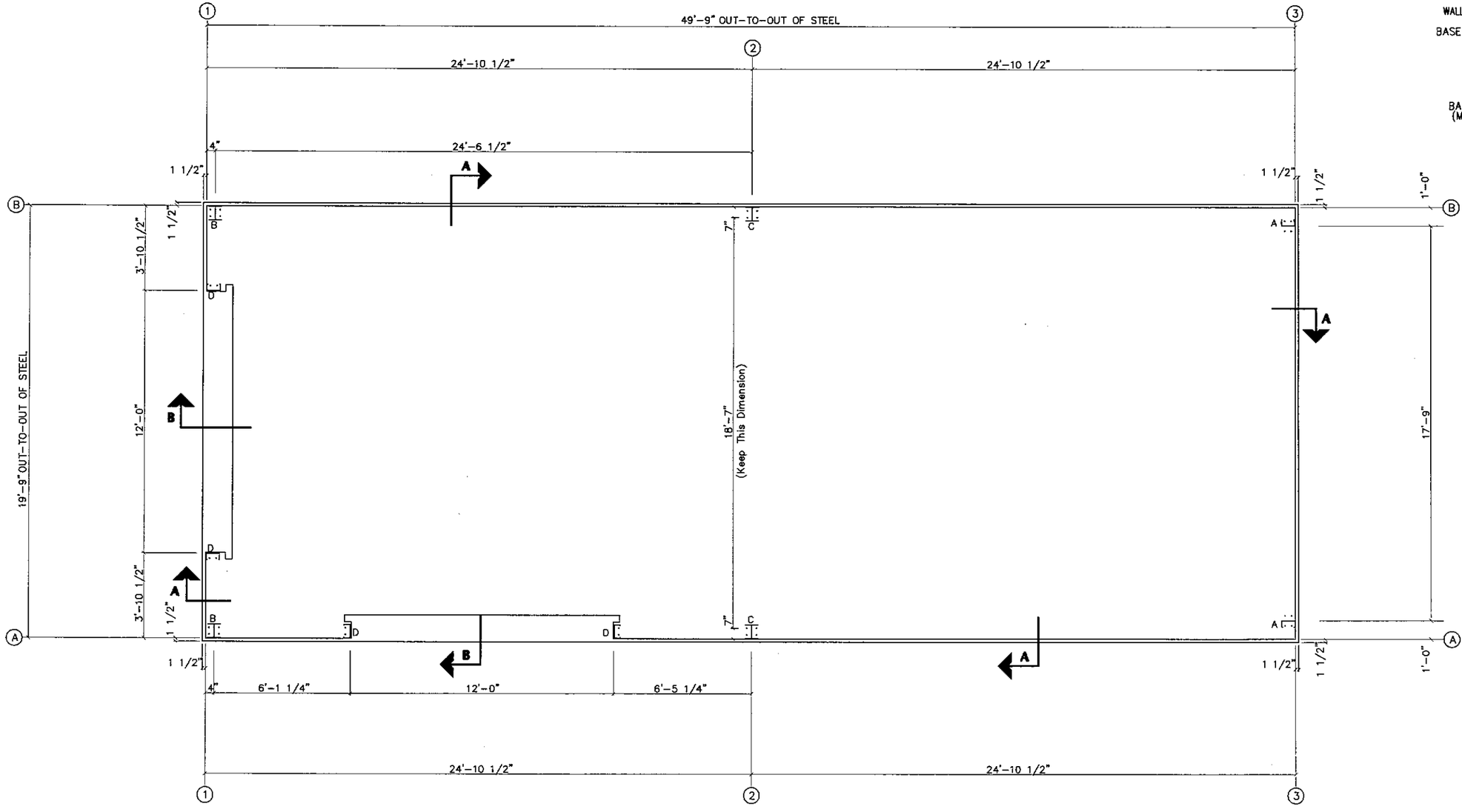
ROOF SNOW LOAD (IN PSF)	EQUIVALENT SNOW HEIGHT AT ROOF (IN INCHES)	RECOMMENDED SNOW HEIGHT WHEN SNOW REMOVAL SHOULD START (IN INCHES)
20	16.60	8.30
25	17.25	8.62
30	17.90	8.95
35	18.55	9.28
40	19.20	9.60
45	19.85	9.92
50	20.50	10.25
55	21.15	10.58
60	21.80	10.90
65	22.45	11.22
70	23.10	11.55
75	23.75	11.88
80	24.40	12.20

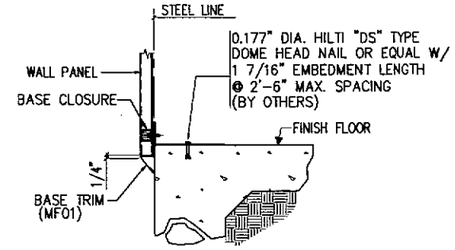
NOTE:
For Snow/Ice Removal Procedure, Refer to Metal Building System Manual 2002 Edition, Section A8.4, Page XI–A8–2.

TBPE FIRM REG. NO: F–3117

SEALING OF THIS DRAWING DOES NOT IMPLY OR CONSTITUTE THAT RIGID GLOBAL ENGINEER IS THE ENGINEER OF RECORD OR THE DESIGN PROFESSIONAL FOR THIS PROJECT. ONLY THE DESIGN OF THE METAL BUILDING SYSTEM AS FURNISHED BY RIGID IS INCLUDED. FOUNDATION ANALYSIS, ELECTRICAL, AND MECHANICAL SYSTEMS, AND/OR OTHER PARTS SUPPLIED BY ANYONE OTHER THAN RIGID ARE SPECIFICALLY EXCLUDED. NO INSPECTION OR SUPERVISION IS IMPLIED.

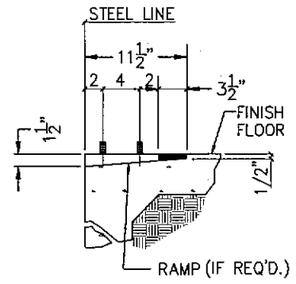
CUSTOMER: South Texas Design Build LLC				
SALES NO.: 41153	JOB NO.: 98744	BLDG.: A (Main)	DWG. NO.: C1 OF 1	ISSUE: A



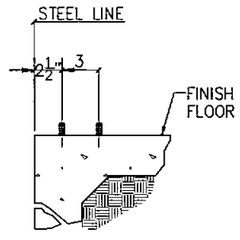


NOTE:
METAL WALL SHEETS SHALL BE SET 1/4" ABOVE CONC. NOTCH. METAL SHEETS SHOULD NOT TOUCH THE CONC. NOTCH, WHICH WOULD VOID THE WARRANTY.

SECTION 'A'



SECTION 'B'



FOR FIELD LOCATE WALKDOOR

COLUMN LAYOUT PLAN

NOTE: All Base Plates @ 100'-0" (U.N.)

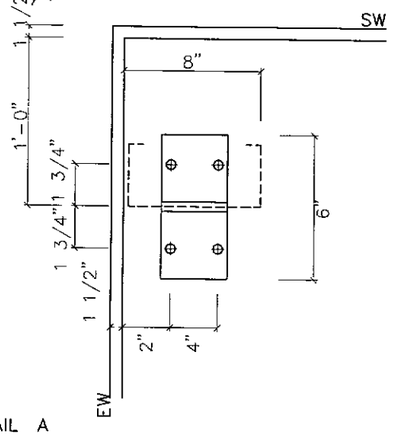
ISSUE	DESCRIPTION	DATE	DRN.	CHK	DES.
0	PERMIT/CONSTRUCTION	10/31/12	FAE	FSA	CC

RIGID GLOBAL BUILDINGS
18933 Aldine Westfield
Houston, Tx. 77073
Phone : (281) 443-9065
Fax : (281) 443-9064

DESCRIPTION	ANCHOR BOLT PLAN
CUSTOMER	SOUTH TEXAS DESIGN BUILD LLC
END USER	South Texas Design Build LLC
END USE	Garage
LOCATION	23255 Fairlake Drive Huffman, Texas 77336

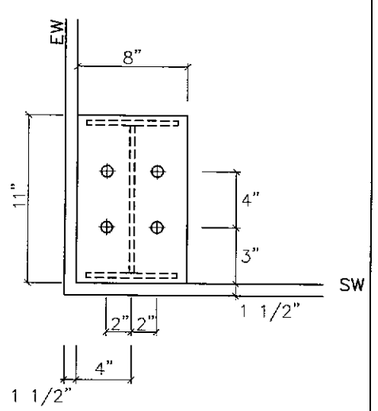
DRAWN BY	CHECKED BY	DESIGN BY	SCALE
FAE/FCT	FSA	CC	NOT TO SCALE
SALES NO. 41153	JOB NO. 98744	BLDG. A (Main)	DWG. NO. F001 REVISION 0

Dia= 5/8"
Thk= 1/4"



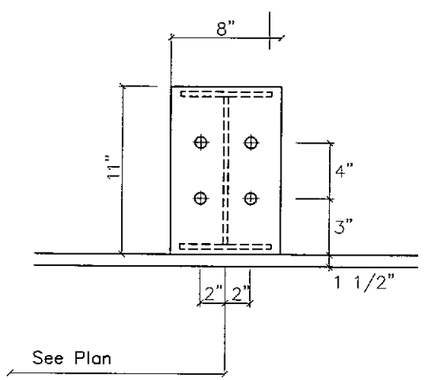
DETAIL A

Dia= 3/4"
Thk= 1/2"



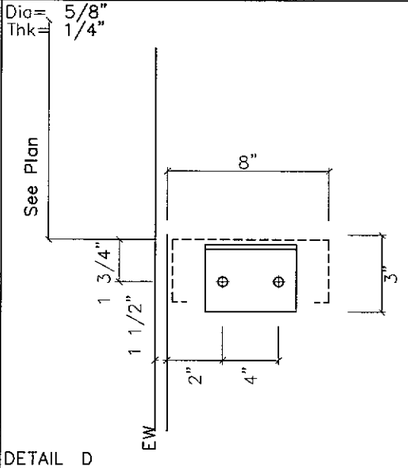
DETAIL B

Dia= 3/4"
Thk= 1/2"



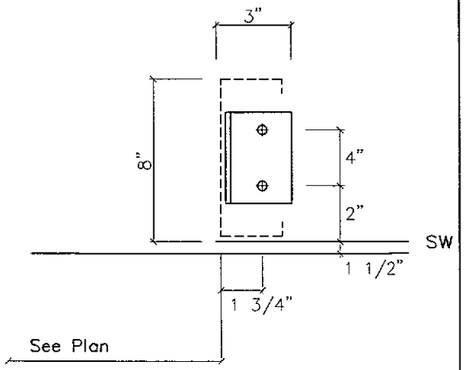
DETAIL C

Dia= 5/8"
Thk= 1/4"



DETAIL D

Dia= 5/8"
Thk= 1/4"



DETAIL E

GENERAL NOTES:

1. THE ANCHOR BOLT DETAILS SHOWN ON THIS DRAWING LOCATE THE ANCHOR BOLTS IN REFERENCE TO BOTH THE BUILDING STEEL LINE AND THE OUTSIDE OF RIGID'S SUGGESTED PANEL RECESS OF 1-1/2".
2. THE ANCHOR BOLT SETTING PLAN LOCATES ANCHOR BOLTS IN REFERENCE TO THE OUTSIDE OF THE PANEL RECESS SHOWN. IF THE ACTUAL PANEL RECESS IS DIFFERENT FROM WHAT IS SHOWN ON THE ANCHOR BOLT SETTING PLAN, THEN ALL REFERENCE DIMENSIONS FROM THE OUTSIDE OF THE PANEL RECESS MUST BE DETERMINED BY THE CUSTOMER.
3. BOTTOM OF ALL BASE PLATES ARE AT THE SAME ELEVATION. (UNLESS NOTED)

NOTE:

ONLY ANCHOR BOLTS SETTING PLAN ISSUED & STAMPED "FOR CONSTRUCTION" SHALL BE USED IN SETTING ANCHOR BOLTS. 'RIGID GLOBAL BUILDINGS' SHALL NOT BE RESPONSIBLE FOR ERROR OR DISCREPANCY IF THE DRAWING USED IS NOT VALID FOR CONSTRUCTION.

QTY.	SYMBOL	DIA.	PROJ
XX	+	1/2"	1"
16	⊕	5/8"	2"
16	⊕	3/4"	2 1/2"
XX	⊕	7/8"	2 3/4"
XX	⊕	1"	3"
XX	⊕	1 1/8"	3 1/2"
XX	⊕	1 1/2"	3 1/2"

ANCHOR BOLTS NOT BY RIGID GLOBAL BUILDINGS

ANCHOR BOLT DETAIL

ANCHOR BOLT PROJECTION "PROJ." IS MEASURED FROM BOTTOM OF BASE PLATE

LENGHT OF "PROJ." SHOWN IS FOR ONE NUT + ONE WASHER

DETAIL OF ANCHOR BOLT AS PER THE SUPPLIER

NUTS & WASHERS BY SUPPLIER

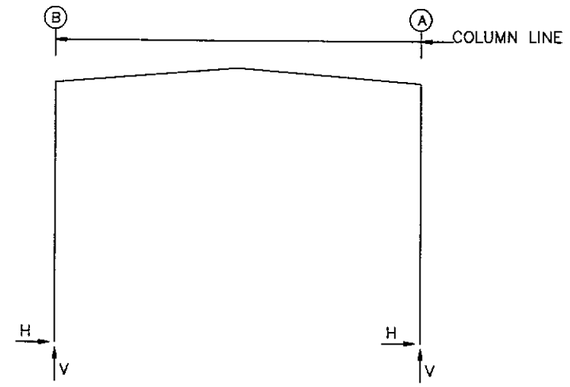
ISSUE	DESCRIPTION	DATE	DRN.	CHK	DES.
0	PERMIT	10/31/12	FAE	FSA	CC

RIGID GLOBAL BUILDINGS
18933 Aldine Westfield
Houston, Tx. 77073
Phone : (281) 443-9065
Fax : (281) 443-9064

DESCRIPTION	**ANCHOR BOLT DETAILS**
CUSTOMER	SOUTH TEXAS DESIGN BUILD LLC
END USER	South Texas Design Build LLC
END USE	Garage
LOCATION	23255 Fairlake Drive Huffman, Texas 77336

DRAWN BY:	CHECKED BY:	DESIGN BY:	SCALE:
FAE/FCT	FSA	CC	NOT TO SCALE
SALES NO.: 41153	JOB NO.: 98744	BLDG.: A (Main)	DWG. NO.: F002 REV.: 0

FRAME LINES: 1 2



RIGID FRAME: MAXIMUM REACTIONS, ANCHOR BOLTS, & BASE PLATES

Frm Line	Col Line	Column Reactions (k) Load ID	Hmax H	V Vmax	Load ID	Hmin H	V Vmin	Anc. Bolt Qty	Anc. Bolt Dia	Base Plate (in) Width	Length	Thick	Grout (in)
1*	B	3	2.5	3.0	4	−3.8	−3.8	4	0.750	8.000	11.00	0.500	0.0
		1	0.9	5.3	6	1.4	−6.0						
1*	A	5	3.8	−3.8	2	−2.5	3.0	4	0.750	8.000	11.00	0.500	0.0
		1	−0.9	5.3	7	−1.4	−6.0						

1* Frame lines: 1 2

NOTES FOR REACTIONS

1. All loading conditions are examined and only maximum/minimum H or V and the cooresponding H or V are reported.
2. Positive reactions are as shown in the sketch. Foundation loads are in opposite directions.
3. Bracing reactions are in the plane of the brace with the H pointing away from the braced bay. The vertical reaction is downward.
4. Building reactions are based on the following building data.

Width (ft)	: 19.75	
Length (ft)	: 49.75	
Eave Height (ft)	: 14 / 14	
Roof Slope (rise/12)	: 1.0:12 / 1.0:12	
Design Code	: IBC 09	
Enclosure	: Closed	
Dead Load (psf)	: 2.000	
Collateral Load (psf)	: 0	
Wind Speed (mph)	: 110 mph	
Wind Importance Factor	: 1.00	
Wind Exposure	: B	
Live Load (psf)	: 20.00	
Frame Live Load (psf)	: 14.17 / 18.98	
Ground Snow Load (psf)	: 0.000	
Roof Snow Load (psf)	: 0	
Snow Exposure	: 1.000	
Snow Importance Factor	: 1.000	
Thermal Factor	: 1.000	
Seismic Importance Factor	: 1.00	
Spectral Response Accel.	: Ss=0.093	: S1=0.040
Spectral Response Coeff.	: Sds=0.099	: Sd1=0.064
Seismic Coeff. (Fa*Ss)	: 0.149	: Fa=1.600
Seismic Design Category	: A	

5. Loading conditions are:

1 DL+CL+LL
2 DL+CL+0.75LL+0.75WL1
3 DL+CL+0.75LL+0.75WR1
4 0.60DL+WL2
5 0.60DL+WR2
6 0.60DL+LnWnd1+LWIND1_L2E
7 0.60DL+LnWnd1+LWIND1_R2E
8 0.60DL+WL2+WS
9 0.60DL+WP+LnWnd1
10 0.60DL+WR2+WS

RIGID FRAME: BASIC COLUMN REACTIONS (k)

Frame Line	Column Line	Dead Horiz	Dead Vert	Live Horiz	Live Vert	Wind_L1 Horiz	Wind_L1 Vert	Wind_R1 Horiz	Wind_R1 Vert	Wind_L2 Horiz	Wind_L2 Vert	Wind_R2 Horiz	Wind_R2 Vert
1*	B	0.1	0.9	0.8	4.4	−3.0	−6.4	2.4	−1.6	−3.9	−4.4	1.5	0.4
1*	A	−0.1	0.9	−0.8	4.4	−2.4	−1.6	3.0	−6.4	−1.5	0.4	3.9	−4.4

Frame Line	Column Line	LnWind1 Horiz	LnWind1 Vert	LnWind2 Horiz	LnWind2 Vert	Seismic_L Horiz	Seismic_L Vert	Seismic_R Horiz	Seismic_R Vert	LnSeis Horiz	LnSeis Vert	LWIND1_L2E Horiz	LWIND1_L2E Vert
1*	B	1.3	−5.5	0.4	−3.5	−0.1	−0.1	0.1	0.1	0.0	−0.1	0.0	−1.0
1*	A	−1.3	−5.5	−0.4	−3.5	−0.1	0.1	0.1	−0.1	0.0	−0.1	0.1	−0.3

Frame Line	Column Line	LWIND1_R2E Horiz	LWIND1_R2E Vert	LWIND2_L2E Horiz	LWIND2_L2E Vert	LWIND2_R2E Horiz	LWIND2_R2E Vert
1*	B	−0.1	−0.3	0.0	−1.0	−0.1	−0.3
1*	A	0.0	−1.0	0.1	−0.3	0.0	−1.0

1* Frame lines: 1 2

ENDWALL COLUMN: BASIC COLUMN REACTIONS (k)

Frm Line	Col Line	Dead Vert	Live Vert	Rafter Wind_L Vert	Rafter Wind_R Vert	Brace Wind_L Horz	Brace Wind_L Vert	Brace Wind_R Horz	Brace Wind_R Vert	Wind_P Horz	Wind_S Horz	LnWind1 Vert	LnWind2 Vert
3	A	0.4	2.4	−2.1	−1.6	1.4	−3.0	0.0	−0.8	−1.0	1.1	−2.0	−1.2
3	B	0.4	2.4	−1.6	−2.1	0.0	−0.8	1.4	−3.0	−1.0	1.1	−2.0	−1.2

Frm Line	Col Line	Seis_L Horz	Seis_R Horz	LWIND1_L Horz	LWIND1_L Vert	LWIND1_R Horz	LWIND1_R Vert	LWIND2_L Horz	LWIND2_L Vert	LWIND2_R Horz	LWIND2_R Vert
3	A	0.1	0.0	0.0	−0.5	0.0	−0.1	0.0	−0.5	0.0	−0.1
3	B	0.0	0.1	0.0	−0.1	0.0	−0.5	0.0	−0.1	0.0	−0.5

ENDWALL COLUMN: MAXIMUM REACTIONS, ANCHOR BOLTS, & BASE PLATES

Frm Line	Col Line	Column Reactions (k) Load ID	Hmax H	V Vmax	Load ID	Hmin H	V Vmin	Anc. Bolt Qty	Anc. Bolt Dia	Base Plate (in) Width	Length	Thick	Grout (in)
3	A	8	1.1	−2.8	9	−1.0	−1.8	4	0.625	6.000	6.000	0.250	0.0
		1	0.0	2.7	8	1.1	−2.8						
3	B	10	1.1	−2.8	9	−1.0	−1.8	4	0.625	6.000	6.000	0.250	0.0
		1	0.0	2.7	10	1.1	−2.8						

BUILDING BRACING REACTIONS

Wall Loc	Wall Line	Col Line	± Reactions (k) Wind Horz	Wind Vert	Seismic Horz	Seismic Vert	Panel Shear (lb/ft)
L_EW	1	Rigid Frame At Endwall					
F_SW	A	2,3	1.2	0.6	0.1	0.0	
R_EW	3	A,B	1.4	0.8	0.1	0.0	
B_SW	B	3,2	1.2	0.6	0.1	0.0	

SEALING OF THIS DRAWING DOES NOT IMPLY OR CONSTITUTE THAT RIGID GLOBAL ENGINEER IS THE ENGINEER OF RECORD OR THE DESIGN PROFESSIONAL FOR THIS PROJECT. ONLY THE DESIGN OF THE METAL BUILDING SYSTEM AS FURNISHED BY RIGID IS INCLUDED. FOUNDATION ANALYSIS, ELECTRICAL, AND MECHANICAL SYSTEMS, AND/OR OTHER PARTS SUPPLIED BY ANYONE OTHER THAN RIGID ARE SPECIFICALLY EXCLUDED. NO INSPECTION OR SUPERVISION IS IMPLIED.

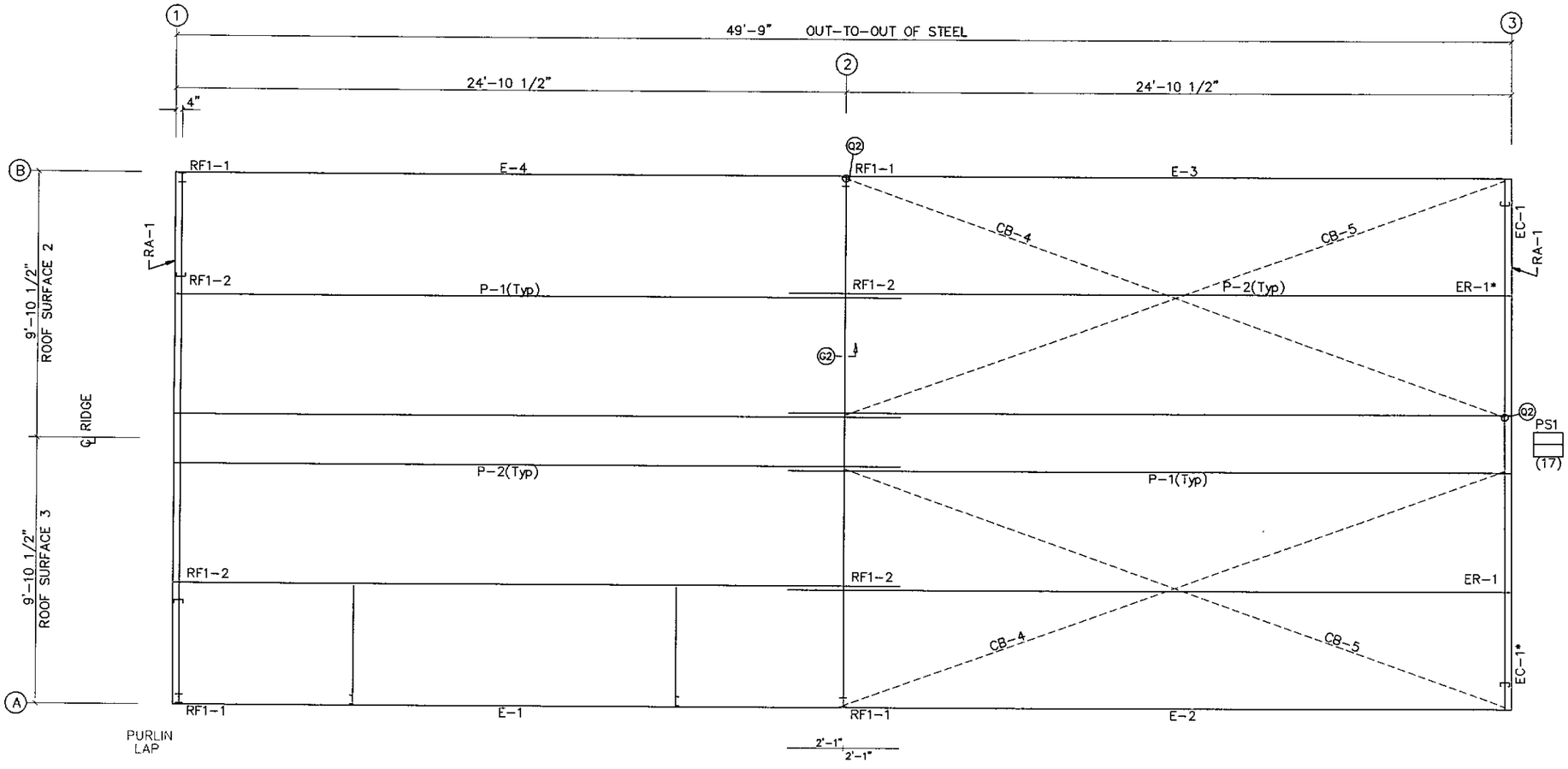
ISSUE	DESCRIPTION	DATE	DRN.	CHK	DES.
0	PERMIT	10/31/12	FAE	FSA	CC

RIGID GLOBAL BUILDINGS
18933 Aldine Westfield
Houston, Tx. 77073
Phone : (281) 443-9065
Fax : (281) 443-9064

DESCRIPTION	ANCHOR BOLT REACTION
CUSTOMER	SOUTH TEXAS DESIGN BUILD LLC
END USER	South Texas Design Build LLC
END USE	Garage
LOCATION	23255 Fairlake Drive Huffman, Texas 77336

DRAWN BY:	CHECKED BY:	DESIGN BY:	SCALE:
FAE/FCT	FSA	CC	NOT TO SCALE
SALES NO.: 41153	JOB NO.: 98744	SIZE: A (Main)	DWG. NO.: F003 REVISE: 0

MEMBER TABLE ROOF PLAN	
MARK	PART
P-1	8x25Z14
P-2	8x25Z14
E-1	L8ES16
E-2	L8ES16
E-3	L8ES16
E-4	L8ES16
CB-4	CB0250
CB-5	CB0250



ROOF FRAMING PLAN

NOTE: 3" THICK INSULATION (BY RGB)

ROOF SHEETING

PANELS: 26GA. 'PBR'
CRIMSON RED S2000

IMPORTANT NOTES:

1. OIL CANNING OF PANELS IS NOT A CAUSE OF REJECTION.
2. EXTREME CARE MUST BE EXERCISED DURING ERECTION OF ROOF PANELS AND TRIMS. FOOT TRAFFIC MAY RESULT IN PERMANENT PANEL DISTORTION AND FINISH ABRASION.

ERECTOR'S NOTE

1. MEMBER SCREW AND STITCH SCREW PATTERNS AND LOCATIONS SHALL BE IN ACCORDANCE WITH ROOF AND WALL DETAILS SHOWN ON DWG.# E009
2. RGB SUPPLIES 5% FOR OVERAGE AND ANY CLAIM ON SHORTAGE BECAUSE OF NON-COMPLIANCE WITH THE DRAWINGS SHALL NOT BE RGB'S RESPONSIBILITY.
3. IN THE EVENT THAT A DISCREPANCY OR ERROR ARISES WITH MATERIALS SHIPPED FOR THIS PROJECT OR ON THESE ERECTION DRAWINGS, THE ERECTOR/INSTALLER MUST NOTIFY RGB PRIOR TO CORRECTING. IF RGB IS NOT NOTIFIED, RGB WILL NOT HONOR BACKCHARGES BY ANY PARTY INVOLVED.

ISSUE	DESCRIPTION	DATE	DRN.	CHK	DES.
A	PERMIT	10/3/12	FAE	FSA	CC

RIGID GLOBAL BUILDINGS
18933 Aldine Westfield
Houston, Tx. 77073
Phone : (281) 443-9065
Fax : (281) 443-9064

DESCRIPTION	ROOF FRAMING PLAN & ROOF SHEETING
CUSTOMER	SOUTH TEXAS DESIGN BUILD LLC
END USER	South Texas Design Build LLC
END USE	Garage
LOCATION	23255 Fairlake Drive Huffman, Texas 77336

DRAWN BY:	CHECKED BY:	DESIGN BY:	SCALE
FAE/FCT	FSA	CC	NOT TO SCALE
SALES NO.	JOB NO.	BLDG.	DWG. NO. / REV.
41153	98744	A (Main)	E001 / A

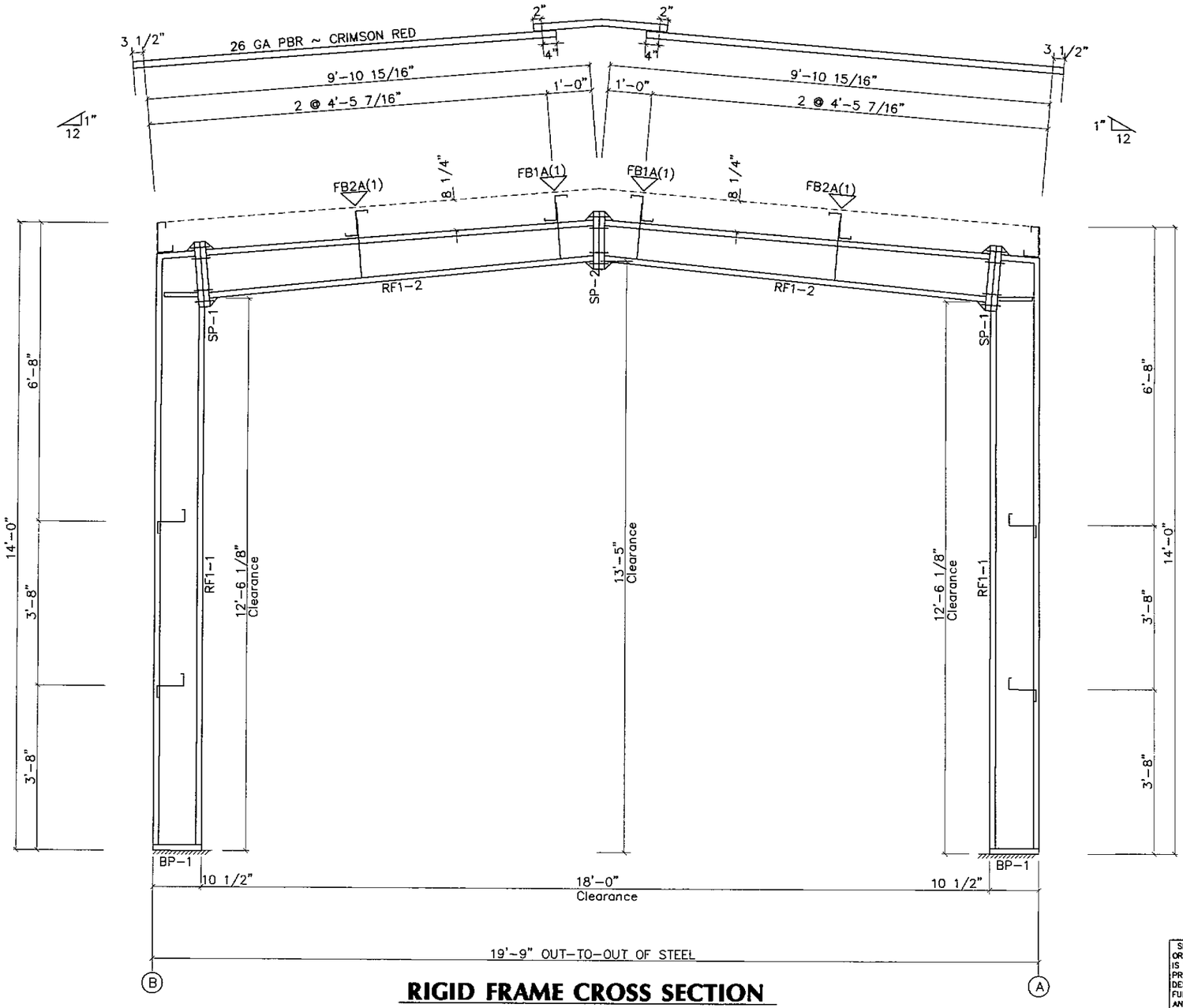
SPLICE PLATE & BOLT TABLE									
Mark	Qty Top	Bot	Int	Type	Dia	Length	Width	Thick	Length
SP-1	4	4	0	A325	0.625	2.00	6"	1/2"	1'-4 3/4"
SP-2	4	4	0	A325	0.625	2.00	6"	1/2"	1'-2 3/4"

STIFFENER TABLE				
Mark	Stiff Mark	Plate Size Width	Thick	Length
RF1-1	St- 1	2.410	0.313	9.230

BASE PLATE TABLE			
Col Mark	Plate Size Width	Thick	Length
BP- 1	8"	1/2"	11"

FLANGE BRACES: Both Sides(U.N.)
FBxxA(1)
A - L2x2x14

MEMBER TABLE					
Mark	Web Depth Start/End	Web Plate Thick	Length	Outside Flange W x Thk x Length	Inside Flange W x Thk x Length
RF1-1	10.0/10.0	0.135	146.4	5 x 1/4" x 159.0	5 x 1/4" x 146.4
	10.0/ 8.9	0.188	13.3	6 x 1/4" x 9.1	
RF1-2	10.0/ 8.0	0.135	108.2	5 x 1/4" x 108.2	5 x 1/4" x 107.6



RIGID FRAME CROSS SECTION

FRAME LINE : 1 2

ISSUE	DESCRIPTION	DATE	DRN	CHK	DES.
A	PERMIT	11/3/11	FAE	FSA	CC

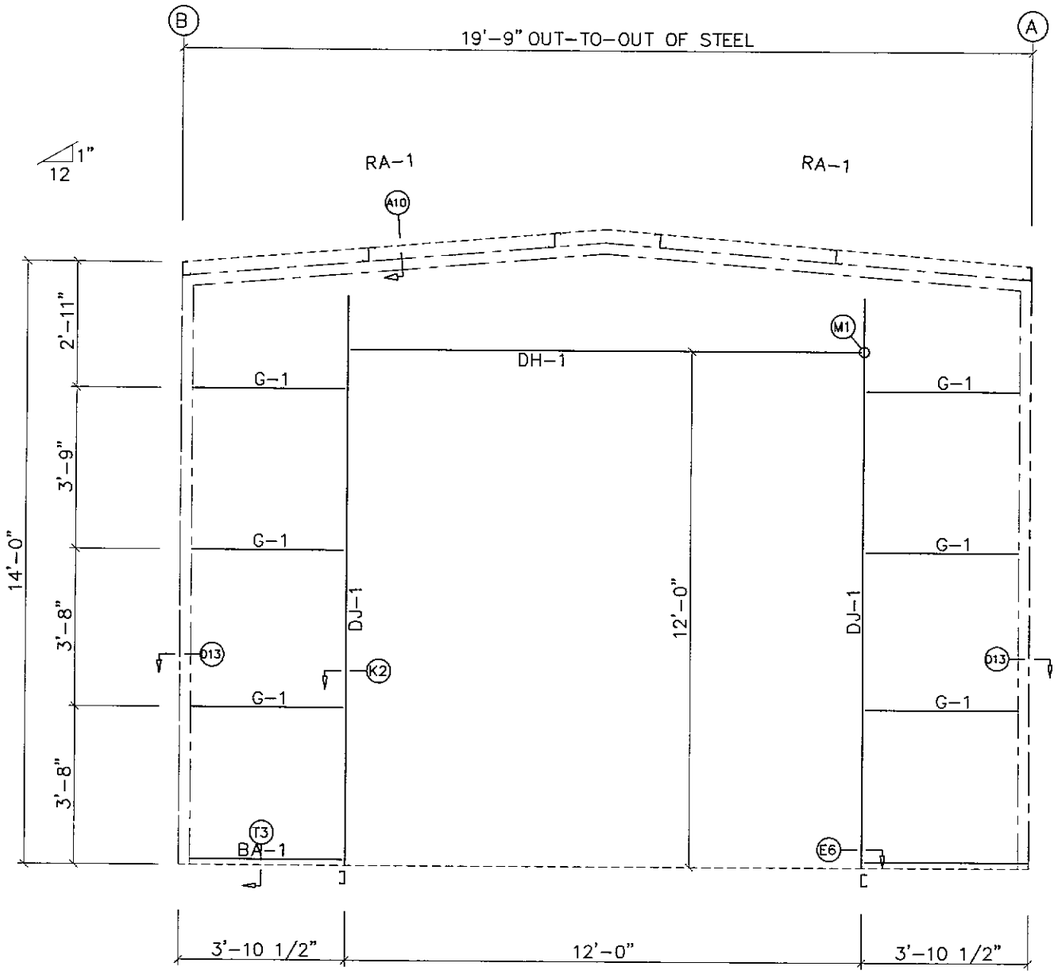
RIGID GLOBAL BUILDINGS
18933 Aldine Westfield
Houston, Tx. 77073
Phone : (281) 443-9065
Fax : (281) 443-9064

DESCRIPTION	RIGID FRAME CROSS SECTION
CUSTOMER	SOUTH TEXAS DESIGN BUILD LLC
END USER	South Texas Design Build LLC
END USE	Garage
LOCATION	23255 Fairlake Drive Huffman, Texas 77336

DRAWN BY:	CHECKED BY:	DESIGN BY:	SCALE:
FAE/FCT	FSA	CC	NOT TO SCALE
SALES NO.: 41153	JOB NO.: 98744	BLDG.: A (Main)	DWG. NO.: E002 REVISE: A

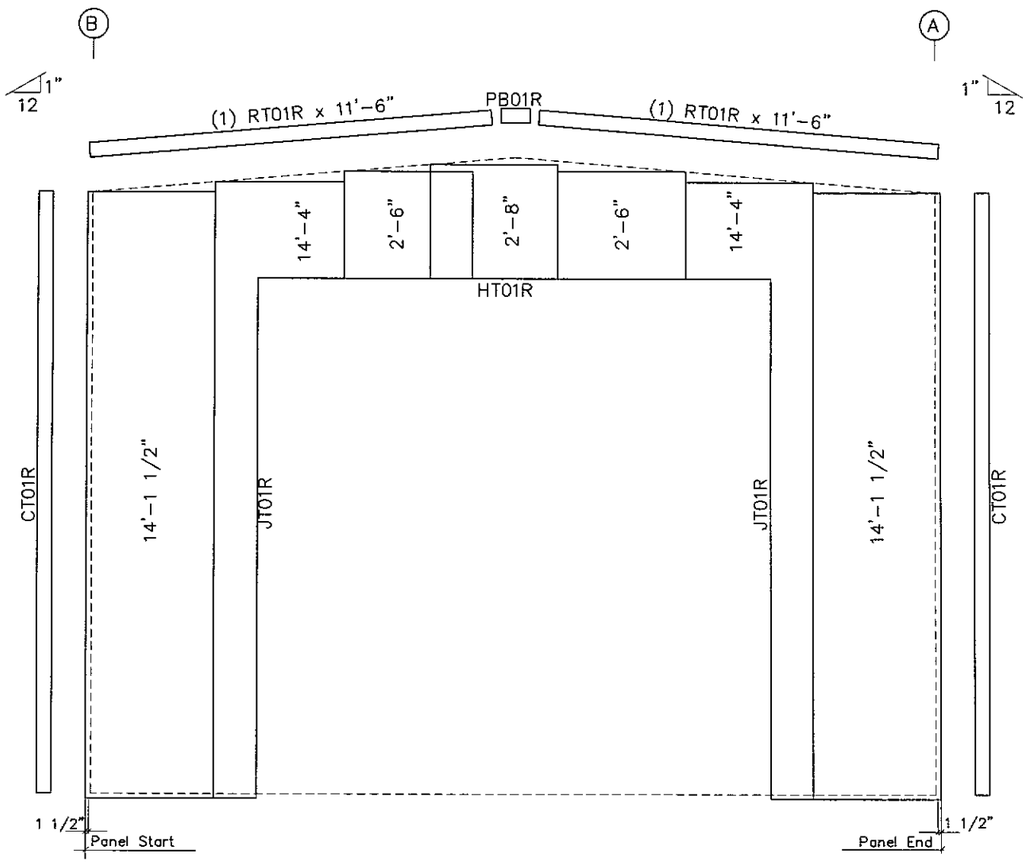
BOLT TABLE FRAME LINE 1				
LOCATION	QUAN	TYPE	DIA	LENGTH
Jamb	2	A307	1/2"	1 1/4"

MEMBER TABLE FRAME LINE 1	
MARK	PART
DJ-1	8x25C16
DH-1	8x25C16
G-1	8x25Z16



ENDWALL FRAMING: FRAME LINE 1

NOTE: 3" THK WALL INSULATION (BY RGB)



ENDWALL SHEETING & TRIM: FRAME LINE 1

PANELS: 26 Ga. 'PBR'
COLORS: FERN GREEN (S2000)

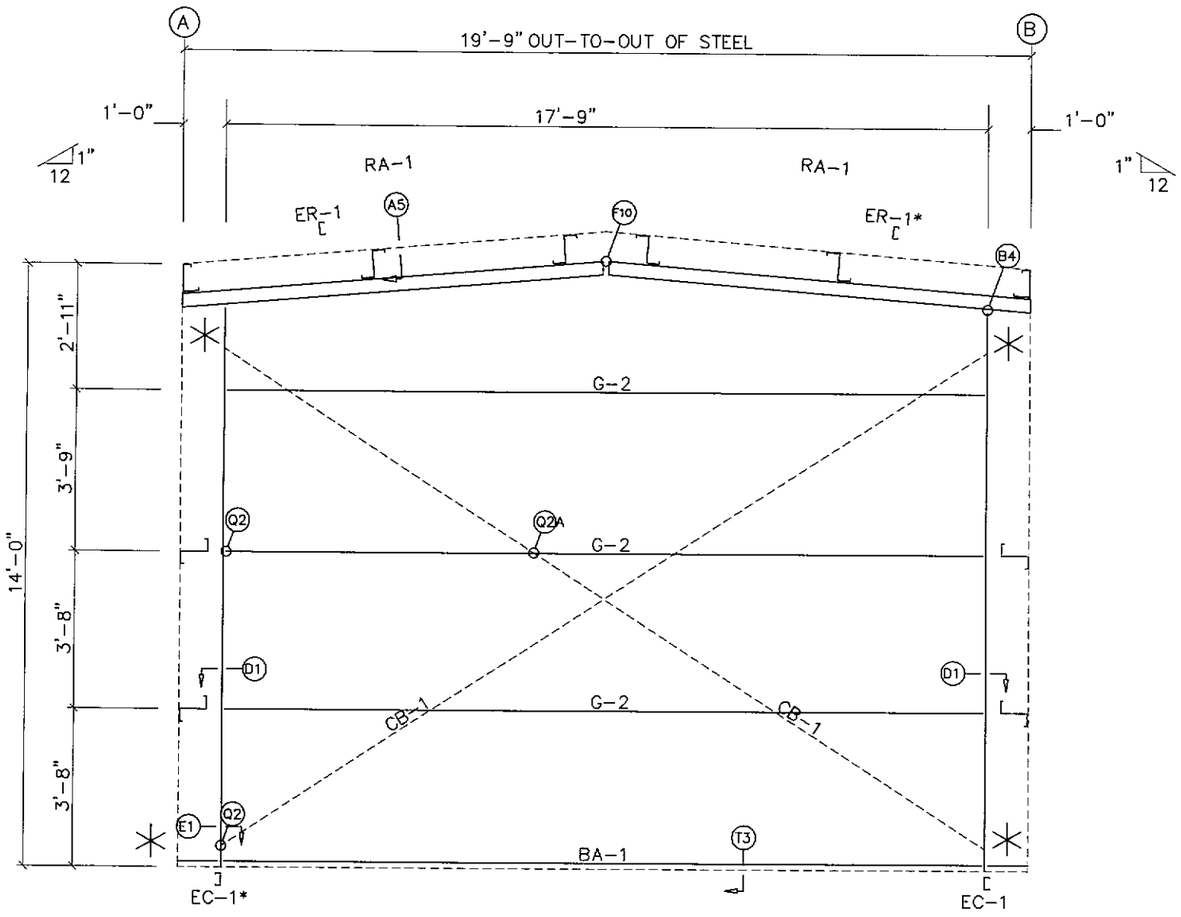
ISSUE	DESCRIPTION	DATE	DRN.	CHK	DES.
A	PERMIT	10/31/12	FAE	FSA	CC

RIGID GLOBAL BUILDINGS
18933 Aldine Westfield
Houston, Tx. 77073
Phone : (281) 443-9065
Fax : (281) 443-9064

DESCRIPTION	ENDWALL FRAMING, SHEETING & TRIMS
CUSTOMER	SOUTH TEXAS DESIGN BUILD LLC
END USER	South Texas Design Build LLC
END USE	Garage
LOCATION	23255 Fairlake Drive Huffman, Texas 77336
DRAWN BY: FAE/FCT	CHECKED BY: FSA / DESIGN BY: CC / SCALE: NOT TO SCALE
SALES NO.: 41153	JOB NO.: 98744 / BLDG.: A (Main) / DWG. NO.: E003 / ISSUE: A

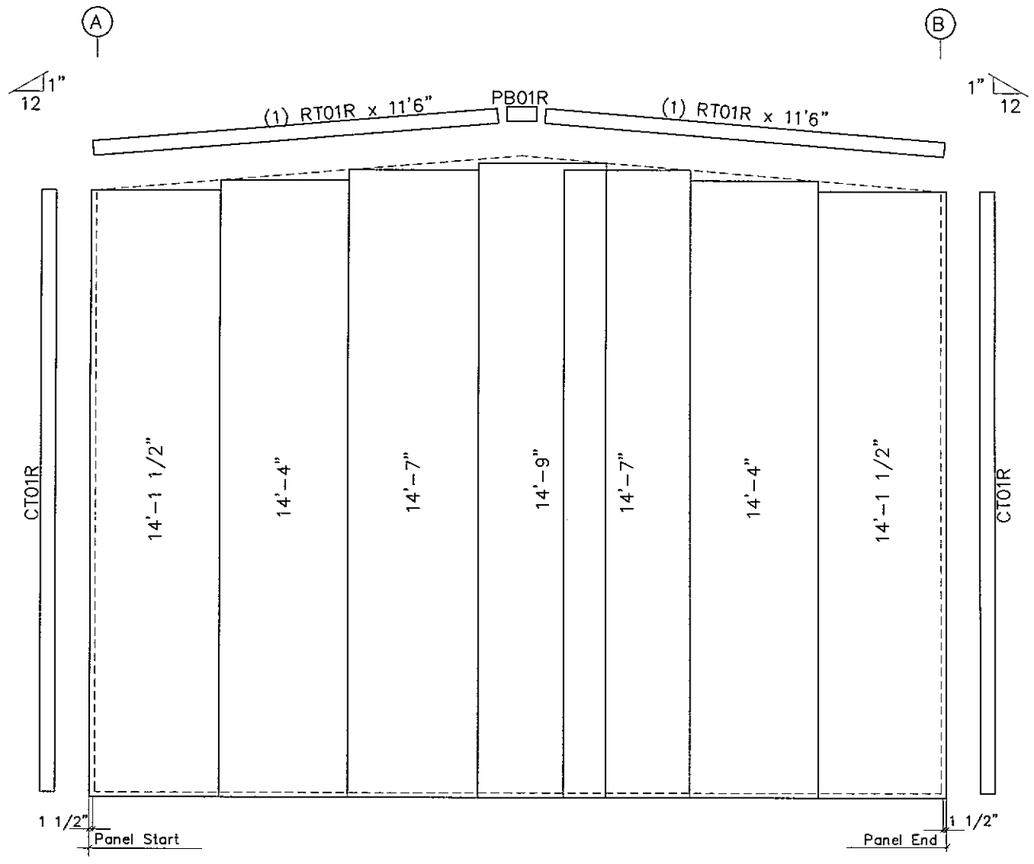
BOLT TABLE FRAME LINE 3				
LOCATION	QUAN	TYPE	DIA	LENGTH
ER-1/ER-1*	4	A325	5/8"	1 3/4"
Columns/Raf	4	A325	5/8"	2 1/4"

MEMBER TABLE FRAME LINE 3	
MARK	PART
EC-1*	8x35C16
EC-1	8x35C16
ER-1	12x35C12
ER-1*	12x35C12
G-2	8x25Z14
CB-1	CB0250



ENDWALL FRAMING: FRAME LINE 3

* - PROVIDE BACK-UP PLATE
3" THK WALL INSULATION (BY RGB)



ENDWALL SHEETING & TRIM: FRAME LINE 3

PANELS: 26 Ga. 'PBR'
COLORS: FERN GREEN (S2000)

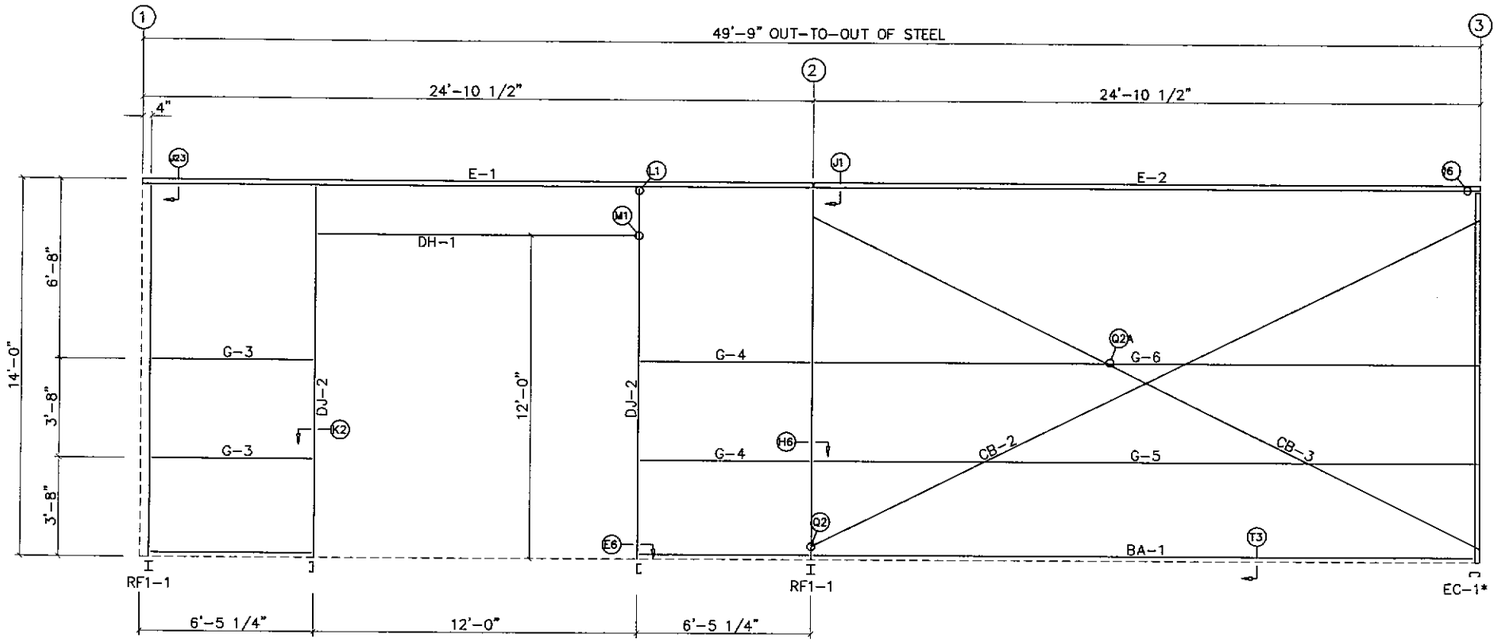
ISSUE	DESCRIPTION	DATE	DRN.	CHK	DES.
A	PERMIT	10/31/12	FAE	FSA	CC

RIGID GLOBAL BUILDINGS
18933 Aldine Westfield
Houston, Tx. 77073
Phone : (281) 443-9065
Fax : (281) 443-9064

DESCRIPTION	ENDWALL FRAMING, SHEETING & TRIMS
CUSTOMER	SOUTH TEXAS DESIGN BUILD LLC
END USER	South Texas Design Build LLC
END USE	Garage
LOCATION	23255 Fairlake Drive Huffman, Texas 77336

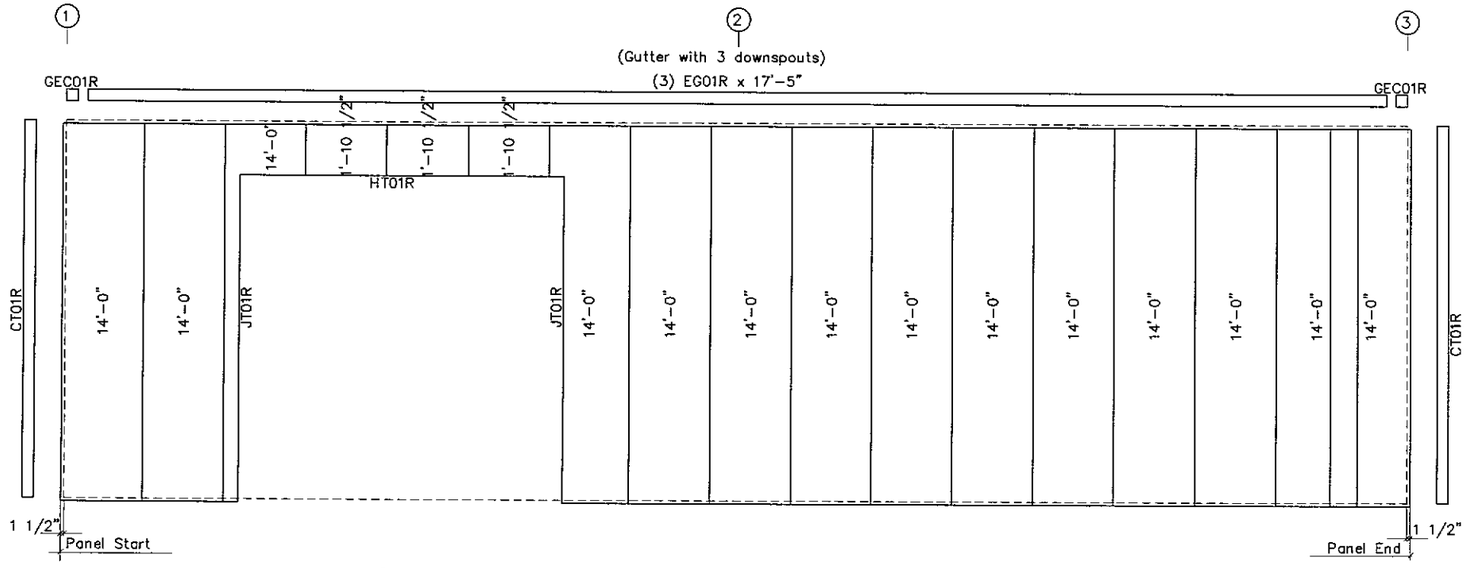
DRAWN BY:	CHECKED BY:	DESIGN BY:	SCALE:
FAE/FCT	FSA	CC	NOT TO SCALE
SALES NO.: 41153	JOB NO.: 98744	BLDG.: A (Main)	DWG. NO.: E004	REVISE: A

MEMBER TABLE FRAME LINE A	
MARK	PART
DJ-2	8x25C16
DH-1	8x25C16
E-1	L8ES16
E-2	L8ES16
G-3	8x25Z16
G-4	8x25Z16
G-5	8x35Z12
G-6	8x25Z26
CB-2	CB0250
CB-3	CB0250



SIDEWALL FRAMING: FRAME LINE A

3" THK WALL INSULATION (BY RGB)



SIDEWALL SHEETING & TRIM: FRAME LINE A

PANELS: 26 Ga. 'PBR'
COLORS: FERN GREEN (S2000)

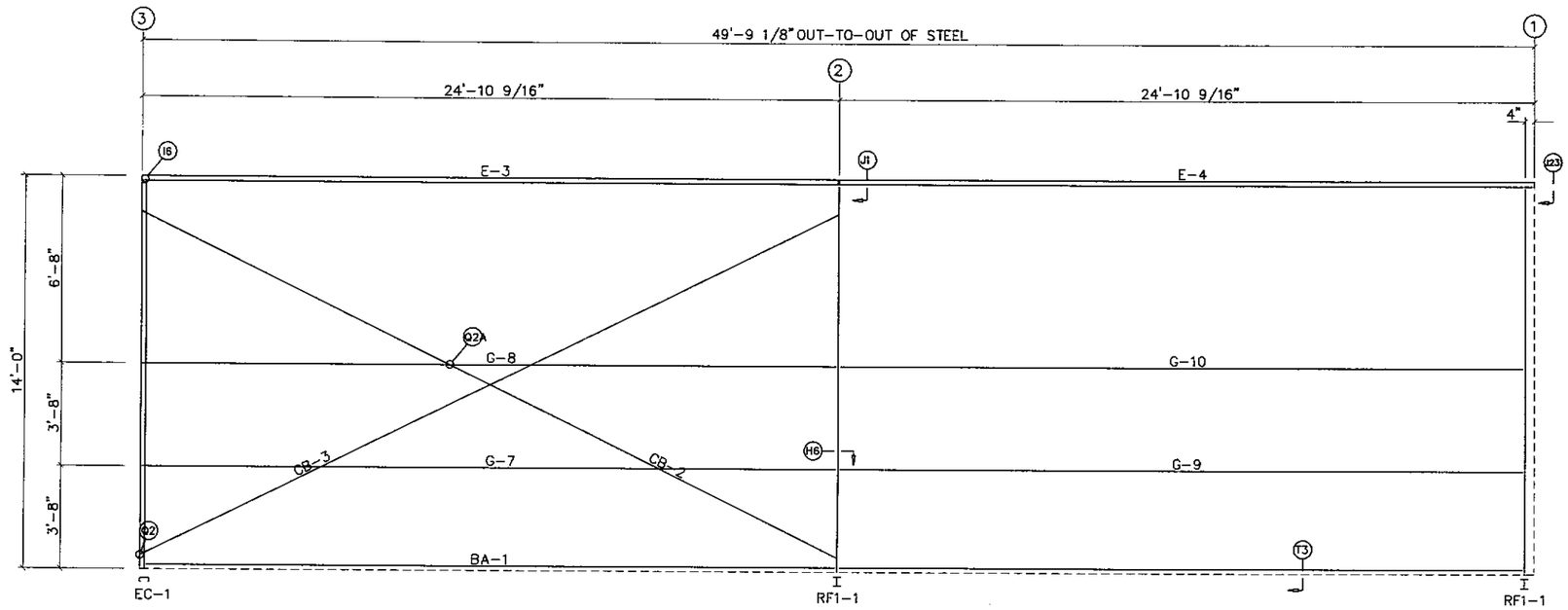
ISSUE	DESCRIPTION	DATE	DRN.	CHK	DES.
A	PERMIT	10/31/12	FAE	FSA	CC

RIGID GLOBAL BUILDINGS
18933 Aldine Westfield
Houston, Tx. 77073
Phone : (281) 443-9065
Fax : (281) 443-9064

DESCRIPTION	SIDEWALL FRAMING, SHEETING &TRIMS
CUSTOMER	SOUTH TEXAS DESIGN BUILD LLC
END USER	South Texas Design Build LLC
END USE	Garage
LOCATION	23255 Fairlake Drive Huffman, Texas 77336

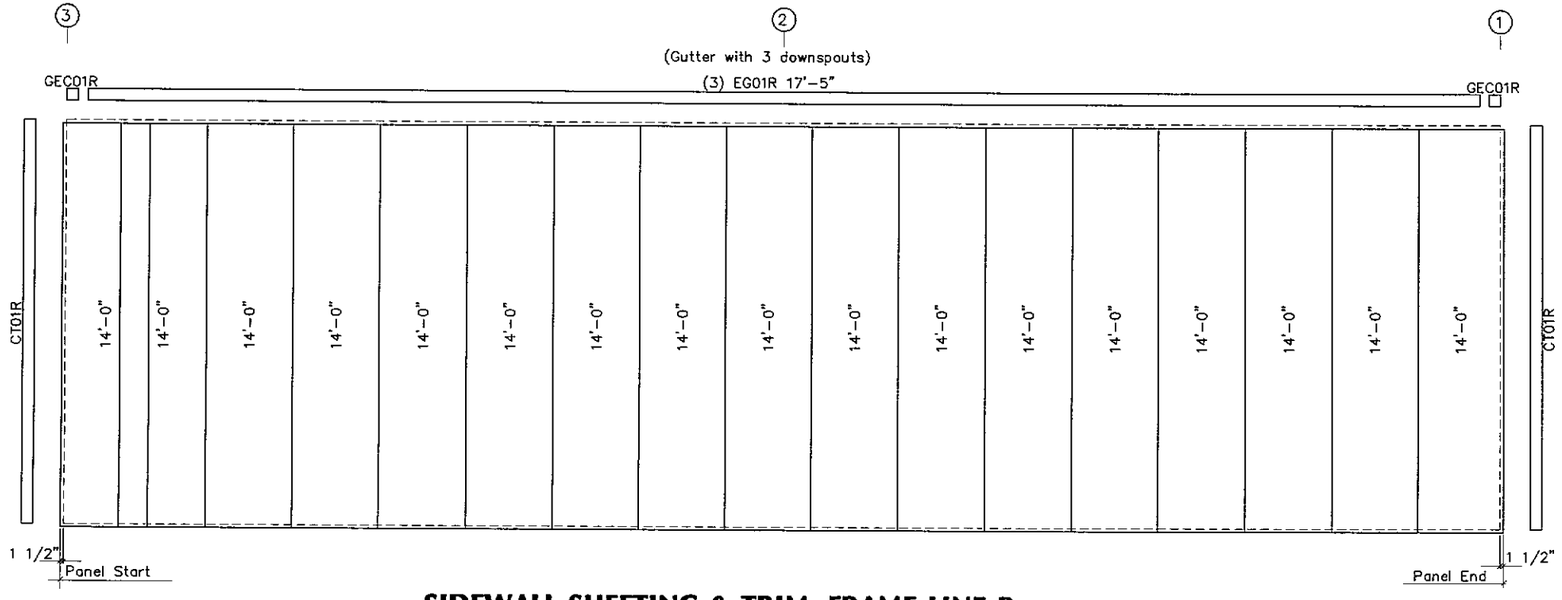
DRAWN BY:	CHECKED BY:	DESIGN BY:	SCALE:
FAE/FCT	FSA	CC	NOT TO SCALE
SALES NO.:	JOB NO.:	BLDG.:	DWG. NO.: / REV.:
41153	98744	A (Main)	E005 / A

MEMBER TABLE FRAME LINE B	
MARK	PART
E-3	L8ES16
E-4	L8ES16
G-7	8x35Z12
G-8	8x25Z26
G-9	8x35Z12
G-10	8x25Z26
CB-2	CB0250
CB-3	CB0250



SIDEWALL FRAMING: FRAME LINE B

3" THK WALL INSULATION (BY RGB)



SIDEWALL SHEETING & TRIM: FRAME LINE B

PANELS: 26 Ga. 'PBR'
COLORS: FERN GREEN (S2000)

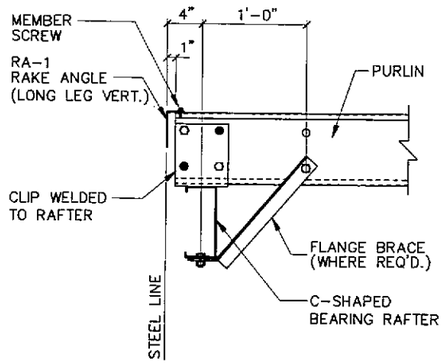
ISSUE	DESCRIPTION	DATE	DRN.	CHK	DES.
A	PERMIT	10/31/12	FAE	FSA	CC

RIGID GLOBAL BUILDINGS
18933 Aldine Westfield
Houston, Tx. 77073
Phone : (281) 443-9065
Fax : (281) 443-9064

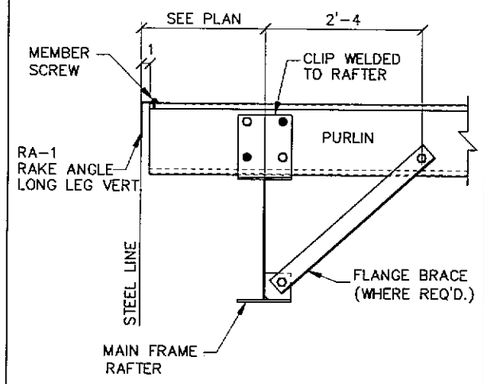
DESCRIPTION	SIDEWALL FRAMING, SHEETING & TRIMS
CUSTOMER	SOUTH TEXAS DESIGN BUILD LLC
END USER	South Texas Design Build LLC
END USE	Garage
LOCATION	23255 Fairlake Drive Huffman, Texas 77336

DRAWN BY:	CHECKED BY:	DESIGN BY:	SCALE:
FAE/FCT	FSA	CC	NOT TO SCALE

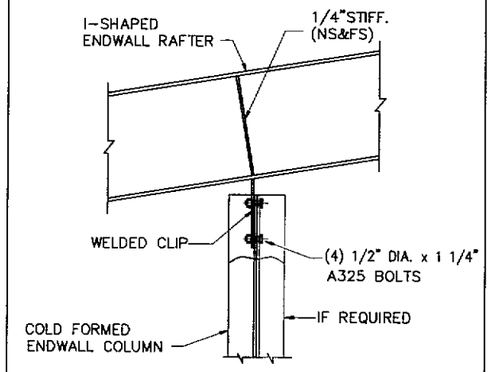
SALES NO.:	JOB NO.:	BLDG.:	DWG. NO.:	REV.
41153	98744	A (Main)	E006	A



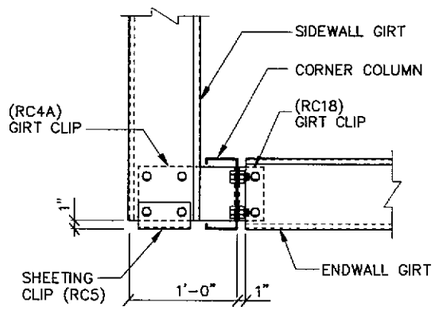
A5 **BEARING FRAME TO FLUSH ENDWALL**
ALL BOLTS ARE 1/2"ø x 1" MACHINE BOLT U.N.



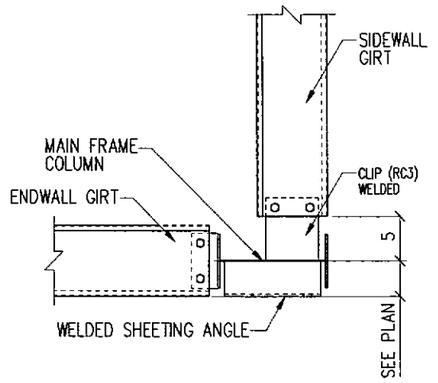
A10 **MAIN FRAME ENDWALL**
ALL BOLTS ARE 1/2"ø x 1" MACHINE BOLTS U.N.



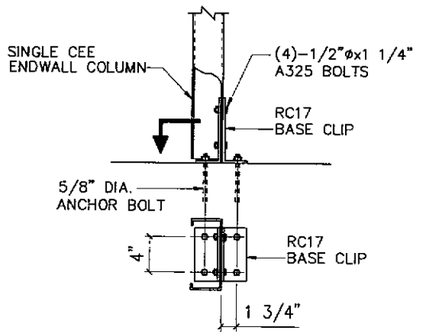
B4 **ENDWALL RAFTER TO COLUMN**
ALL BOLTS AS NOTED



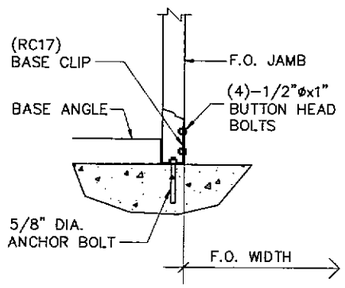
D1 **SINGLE CEE CORNER COLUMN**
ALL BOLTS ARE 1/2" DIA. x 1" MACHINE BOLTS



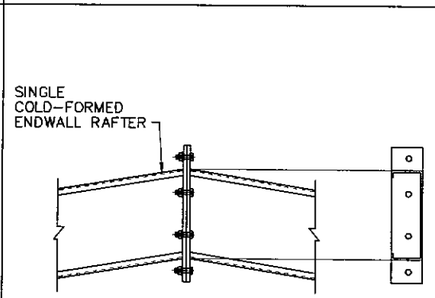
D13 **CORNER COLUMN TO WALL GIRT**
ALL BOLTS ARE 1/2" DIA. x 1" MACHINE BOLTS



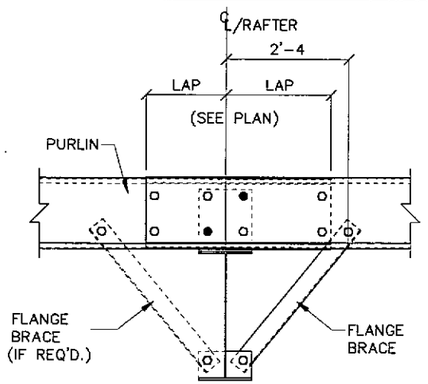
E1 **ENDWALL COLUMN BASE DETAIL**
ALL BOLTS AS NOTED



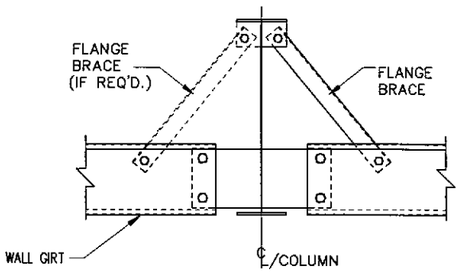
E6 **"FO" JAMB BASE DETAIL**
WITH BOLTED BASE CLIP



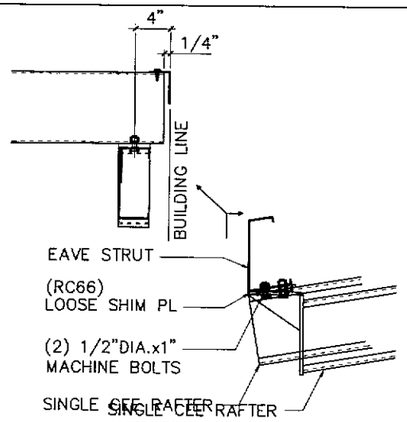
F10 **RAFTER SPLICE AT RIDGE**
SINGLE COLD-FORMED RAFTER
SEE ENDWALL FRAMING ELEV. FOR BOLT DIA AND TYPE.



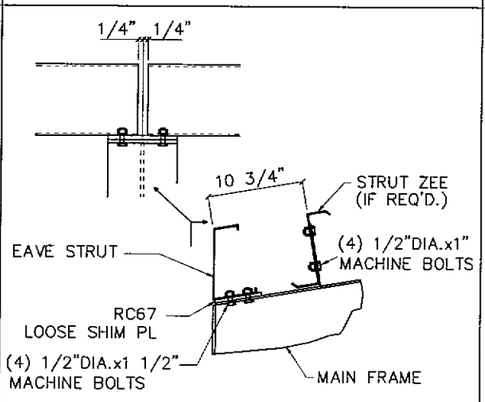
G2 **BY-PASS PURLIN TO RAFTER DETAIL**
ALL BOLTS ARE 1/2"ø x 1" MACHINE BOLTS U.N.



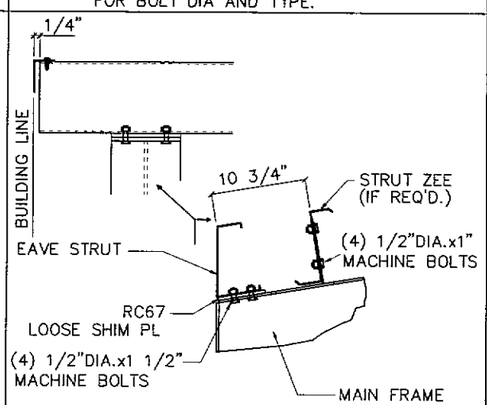
H6 **FLUSH GIRT TO INTERIOR FRAME RAFTER**
ALL BOLTS ARE 1/2"ø x 1" MACHINE BOLTS U.N.



I6 **EAVE STRUT TO ENDWALL RAFTER**
LEBS



J1 **LOW EAVE DETAIL (FLUSH CONDITION)**
AT INTERIOR FRAME



J23 **LOW EAVE DETAIL (FLUSH CONDITION)**
AT END FRAME

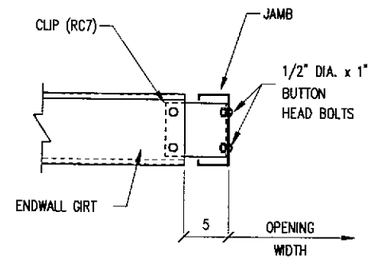
ISSUE	DESCRIPTION	DATE	DRN	CHK	DES.
A	PERMIT	11/21/12	FAE	FSA	CC

RIGID GLOBAL BUILDINGS
18933 Aldine Westfield
Houston, Tx. 77073
Phone : (281) 443-9065
Fax : (281) 443-9064

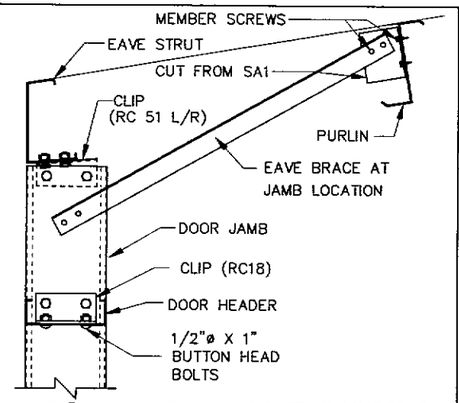
DESCRIPTION	**DETAIL PAGE 1**
CUSTOMER	SOUTH TEXAS DESIGN BUILD LLC
END USER	South Texas Design Build LLC
END USE	Garage
LOCATION	23255 Fairlake Drive Huffman, Texas 77336

DRAWN BY:	CHECKED BY:	DESIGN BY:	SCALE
FAE/FCT	FSA	CC	NOT TO SCALE

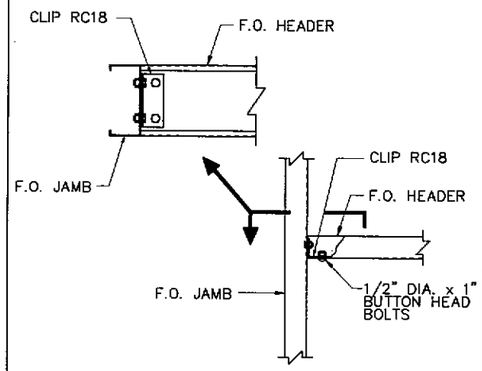
SALES NO:	JOB NO:	BLDG:	DWG. NO:	ISSUE:
41153	98744	A (Main)	E007	A



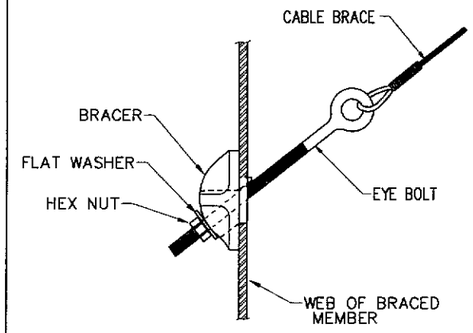
K2 **GIRT TO F.O. JAMB**
ALL BOLTS ARE 1/2"ø x 1" MACHINE BOLTS U.N.



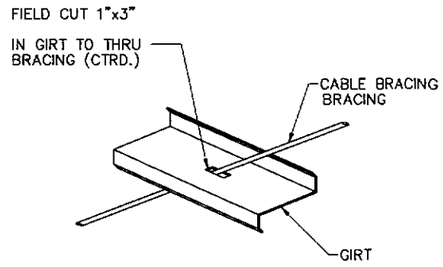
L1 **F.O. JAMB TO EAVE STRUT CONNECTION FOR OVERHEAD DOOR, ROLL-UP DOOR**
ALL BOLTS ARE 1/2"ø x 1" MACHINE BOLTS U.N.



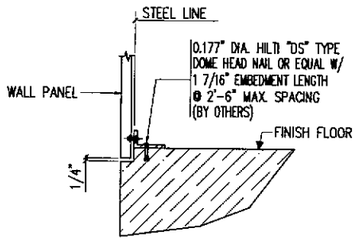
M1 **F.O. HEADER TO F.O. JAMB**
ALL BOLTS ARE 1/2"ø x 1" MACHINE BOLTS U.N.



Q2 **DIAGONAL CABLE, EYEBOLT END**



Q2A **TYP. CABLE BRACING DETAIL THRU GIRT**



NOTE:
METAL WALL SHEETS SHALL BE SET 1/4" ABOVE CONC. NOTCH. METAL SHEETS SHOULD NOT TOUCH THE CONC. NOTCH, WHICH WOULD VOID THE WARRANTY.

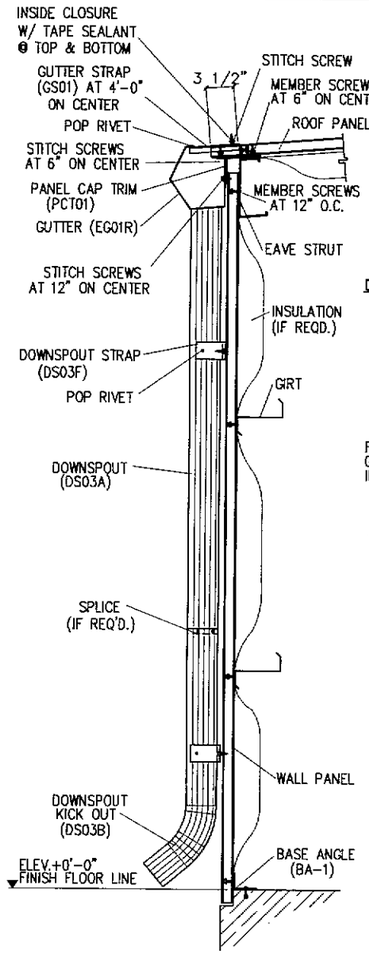
T3 **SECTION THRU WALL PANEL AND CONCRETE FOUNDATION**

ISSUE	DESCRIPTION	DATE	DRN.	CHK	DES.
A	PERMIT	10/31/12	FAE	FSA	CC

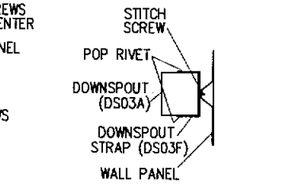
RIGID GLOBAL BUILDINGS
18933 Aldine Westfield
Houston, Tx. 77073
Phone : (281) 443-9065
Fax : (281) 443-9064

DESCRIPTION	**DETAIL PAGE 2**
CUSTOMER	SOUTH TEXAS DESIGN BUILD LLC
END USER	South Texas Design Build LLC
END USE	Garage
LOCATION	23255 Fairlake Drive Huffman, Texas 77336

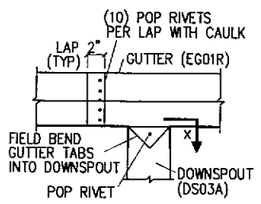
DRAWN BY:	CHECKED BY:	DESIGN BY:	SCALE:
FAE/FCT	FSA	CC	NOT TO SCALE
SALES NO.:	JOB NO.:	BLDG.:	DWG. NO.: / ISSUE:
41153	98744	A (Main)	E008 / A



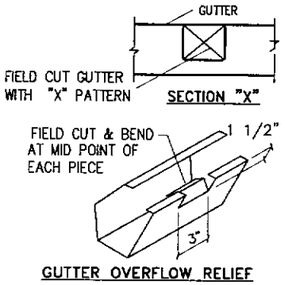
SCULTURED EAVE GUTTER AND DOWNSPOUT DETAIL AT SHEETED WALL
WITH FULLY SHEETED WALL



DOWNSPOUT STRAP ATTACHMENT

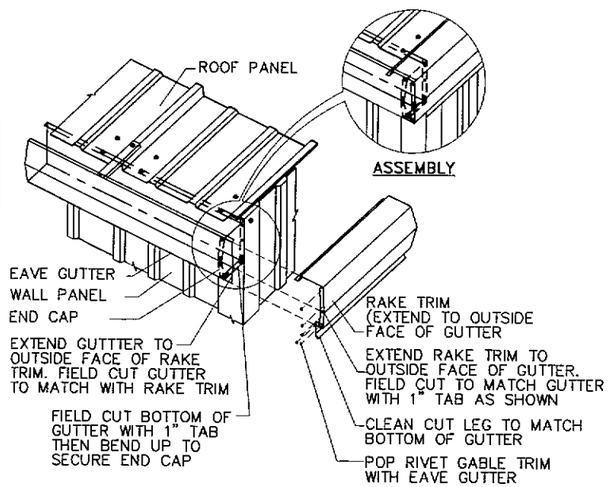


DOWNSPOUT TO GUTTER DETAIL

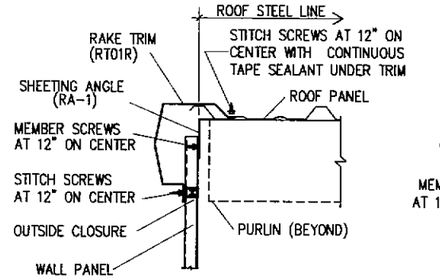


GUTTER OVERFLOW RELIEF

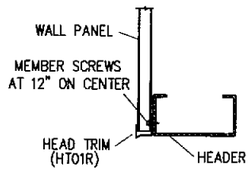
D.S. STRAP QUANTITY	
EAVE HEIGHT	QUANTITY
10'-0	2
12'-0	2
14'-0	2
16'-0	2
20'-0	2
25'-0	3



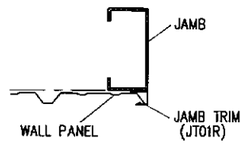
GUTTER & RAKE TRIM JOINT DETAIL
(WITH TYPE-R ROOF PANEL)



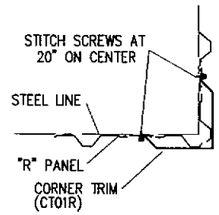
RAKE DETAIL WITH SHEETED WALL
("R" ROOF PANEL SHOWN, "M" ROOF PANEL AVAILABLE.)



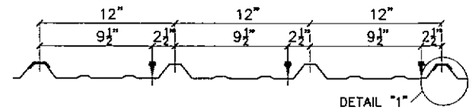
HEADER DETAIL FOR FRAMED OPENINGS



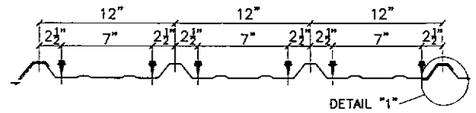
JAMB DETAIL FOR FRAMED OPENINGS



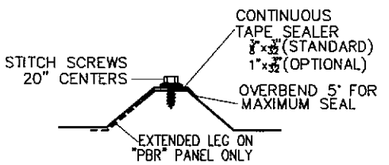
OUTSIDE CORNER DETAIL



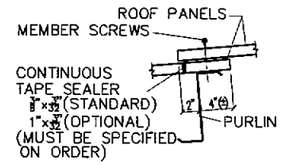
MEMBER SCREW LOCATION
(ALL MEMBERS EXCEPT AS NOTED)



MEMBER SCREW LOCATION
(PEAK PURLIN, EAVE STRUT, AND PANEL END LAPS)

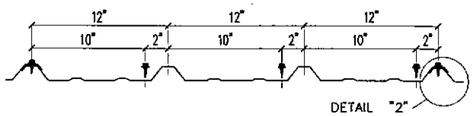


DETAIL "1"

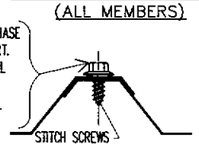


SECTION THRU PEAK PURLIN
AND PANEL END LAPS

"PBR" & "R" ROOF PANEL

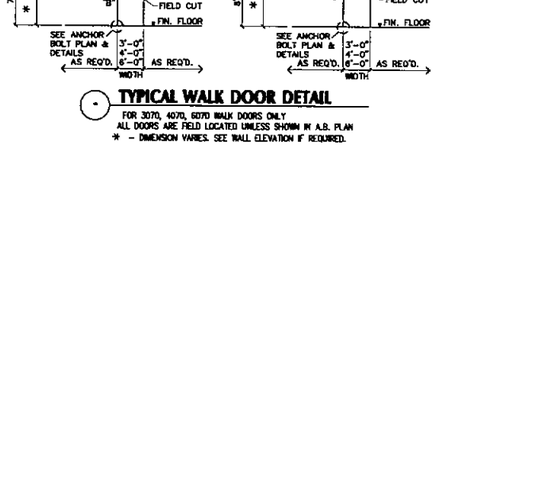


MEMBER SCREW LOCATION
(ALL MEMBERS)



DETAIL "2"

"R" WALL PANEL



TYPICAL WALK DOOR DETAIL
FOR 3070, 4070, 6070 WALK DOORS ONLY.
ALL DOORS ARE FIELD LOCATED UNLESS SHOWN IN A.B. PLAN
* - DIMENSION VARIES. SEE WALL ELEVATION IF REQUIRED.

NOTE!
SCREW PATTERNS SHOWN, SATISFY UL-90 REQUIREMENTS FOR ROOF.

ISSUE	DESCRIPTION	DATE	DRN.	CHK	DES.
A	PERMIT	10/3/12	FAE	FSA	CC

RIGID GLOBAL BUILDINGS
18933 Aldine Westfield
Houston, Tx. 77073
Phone : (281) 443-9065
Fax : (281) 443-9064

DESCRIPTION	**PANEL, TRIMS & ACCESSORIES**
CUSTOMER	SOUTH TEXAS DESIGN BUILD LLC
END USER	South Texas Design Build LLC
END USE	Garage
LOCATION	23255 Fairlake Drive Huffman, Texas 77336
DRAWN BY: FAE	CHECKED BY: FSA · DESIGN BY: CC · SCALE: NOT TO SCALE
SALES NO.: 41153	JOB NO.: 98744 · BLDG.: A (Main) · DWG. NO.: E009 · REV.: 0

Employers of Structural Drafters

→ Structural drafters are usually employed in one of ***two ways***

* ***Prepare engineering and shop drawings of wood, concrete, or steel structural consulting engineer firms.***

* ***Prepare shop drawings for structural steel or precast concrete manufactures.***

Structural Drafting Techniques

- → Structural drafting linework
- → Structural drafting lettering
- → Structural drafting scale use
- → Structural Drafting paper sizes
- → Structural drafting title blocks and borders

Line Types

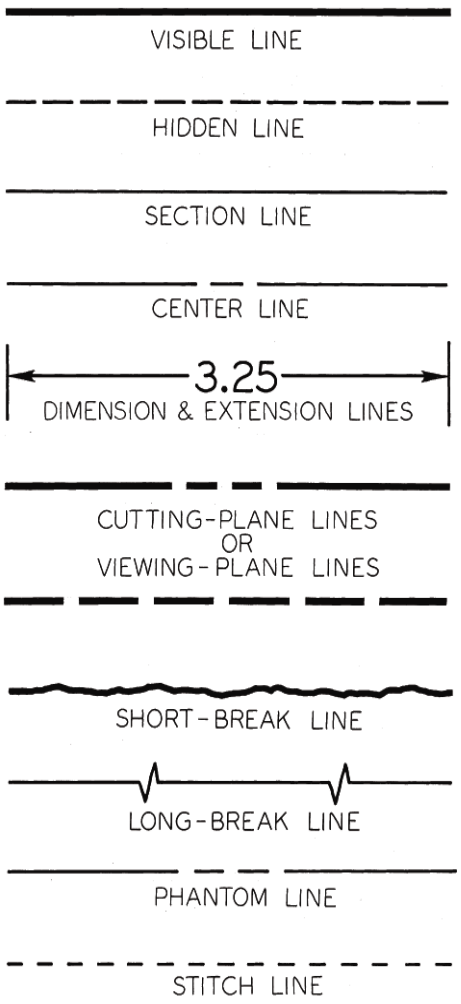


Figure 3-48

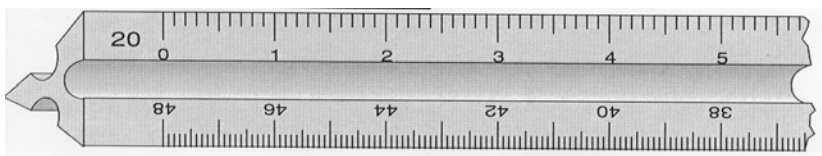
Alphabet of Ink Lines (Full Size).

Scales

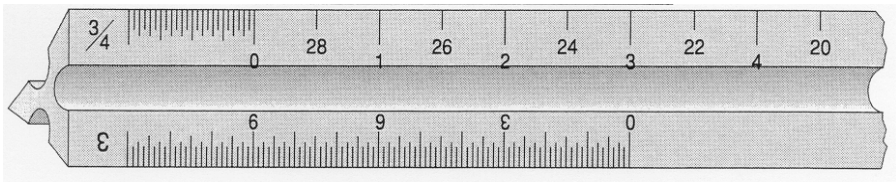
- The purpose of scales is to allow an engineer, architect, technician or contractor to determine scaled measurements from drawings or maps very quickly and easily.
- Drawings and maps are drawn to different scales such as: 1” = 100’, 1” = 1’-0” or 1:2 (half size).

Types of Scales

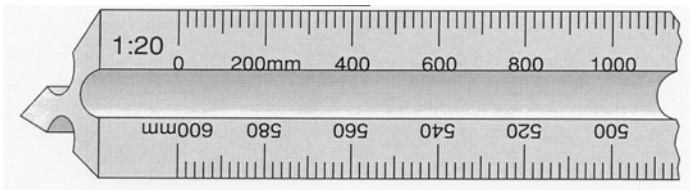
Civil Engineering Scale



Architect's Scale



Metric Scale



Civil Engineer's Scale

- **Full Divided Scale**
- **1" is divided into equal decimal units of 10, 20, 30, 40, 50, 60 and 80 divisions.**
- **For example, 1" = 100' is a typical scale used for Civil Engineering Drawings. This means that 1" on the drawing represents 100' in the real world.**

Scale & Size

- **10 scale represents full size in decimal inches. 1" on paper represents 1" in real life. Hence the name "full size".**
- **20 scale represents half scale where 1" on a drawing represents 2" in real life.**
- **40 scale represents quarter size where 1" on a drawing represents 4" in real life.**

Applications

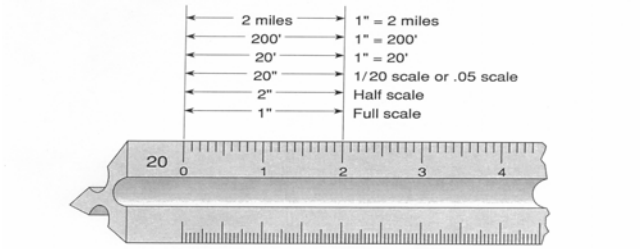
- **Civil Engineers typically design large things such as, bridges, roads, buildings, shopping centers etc. Therefore typical scales used include: 1” = 100’ for plan views of highway designs and 1” = 5’ vertical and 1” = 100’ horizontal for profile views. Section views are typically 1” = 5’ vertical and 1” = 10’ horizontal.**

Other Applications

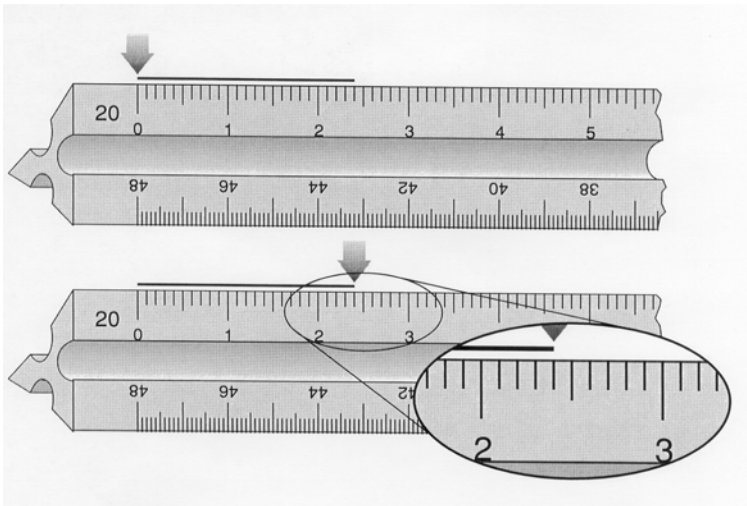
- **Sometimes scales are used to compute quantities based on a graphical analysis. When this is the case units of measurement other than length are often used. Examples include:**
- **1” = 10 kips, 1” = 2000 volts, 1” = 50 buses, 1” = 20 GHz and 1” = 40 people.**
- **Always remember that your answer will be recorded in a decimal format for the CE scale.**

How to use an Engineer's Scale

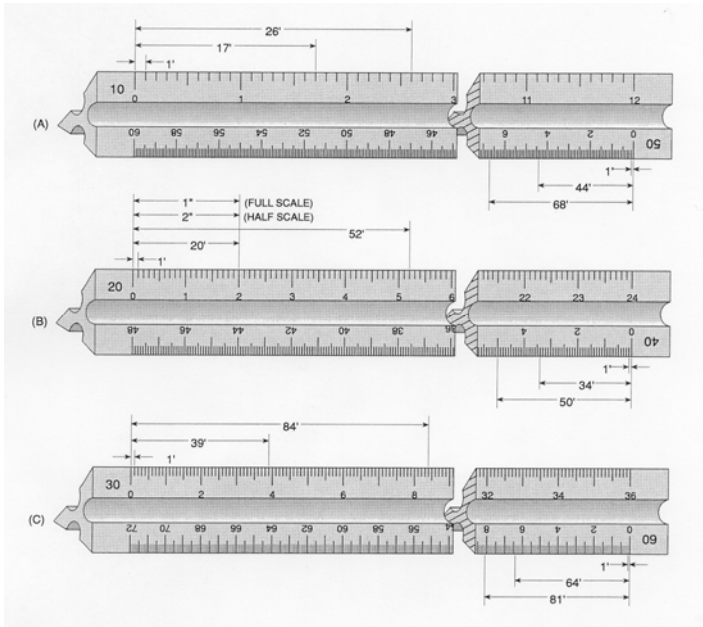
CIVIL ENGINEER'S SCALE					
Divisions	**Ratio**	**Scales Used with This Division**			
10	1:1	1" = 1"	1" = 1"	1" = 10'	1" = 100'
20	1:2	1" = 2"		1" = 20'	1" = 200'
30	1:3	1" = 3"		1" = 30'	1" = 300'
40	1:4	1" = 4"		1" = 40'	1" = 400'
50	1:5	1" = 5"		1" = 50'	1" = 500'
60	1:6	1" = 6"		1" = 60'	1" = 600'



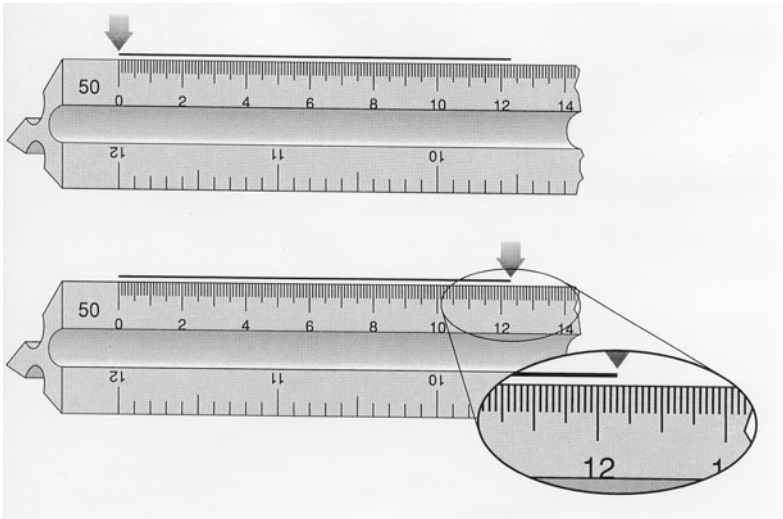
Steps in Reading CE Scale



Examples of Using the CE Scale



Reading the 50 scale



Architect's Scale

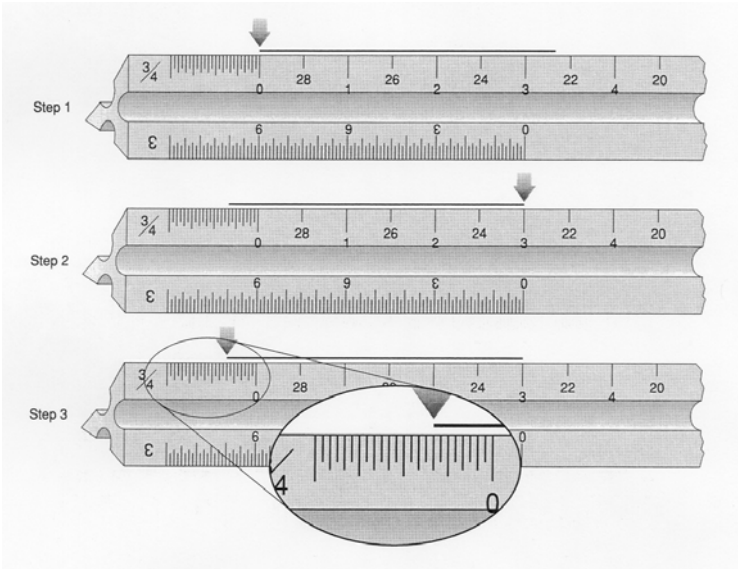
- Architects are involved in large scale projects as well as smaller scale projects. They use a wide range of different scales for their drawings.
- Many Structural Engineering detail drawings are read using the Architect's scale.
- Architect's scale always reads X" = 1'- 0"

  For example, ½" = 1'- 0" or 3" = 1'- 0".

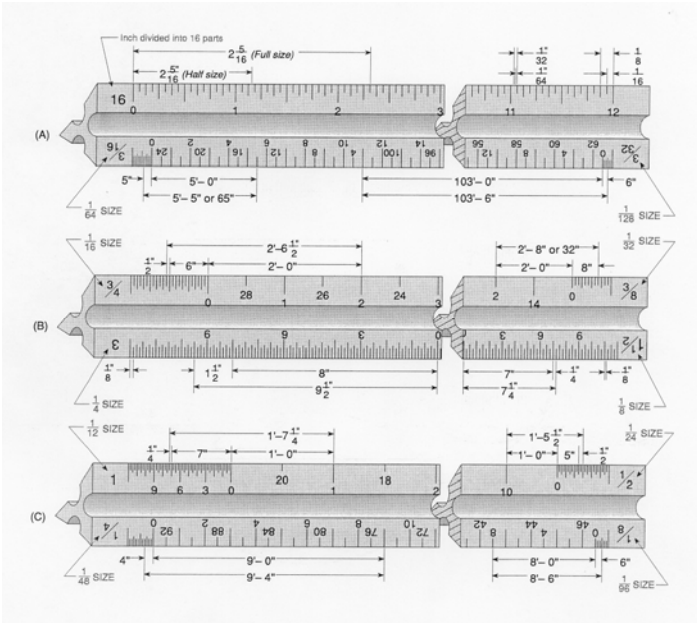
Architect's Scales and Sizes

- 16 Scale = Full Size 12" = 1'- 0". (standard ruler)
- 3"= 1'- 0" = Quarter Size (divide 3"/12" = ¼)
- 1-1/2" = 1'- 0" = 1/8 size
- 1" = 1'- 0" = 1/12 size
- 3/4" = 1'- 0" = 1/16 size
- 1/2" = 1'- 0" = 1/24 size
- 3/8" = 1'- 0" = 1/32 size
- 1/4" = 1'- 0" = 1/48 size
- 1/8" = 1'- 0" = 1/96 size
- 3/32" = 1'- 0" = 1/128 size

Reading an Architect's Scale



Examples of using the Architect's Scale



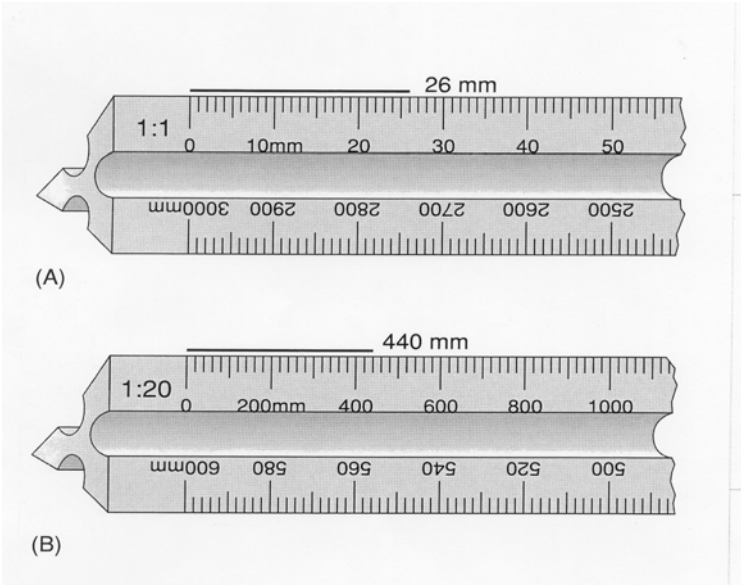
International System of Units

- Millimeter (mm) is the primary SI unit.
- Conversion: U.S. Customary 1” = 25.4 mm.
- Kilometer is used for large scale drawings.
- 1 km = 1,000 m
- 1 m = 1,000 mm
- 1 m = 100 cm
- 1 cm = 10 mm

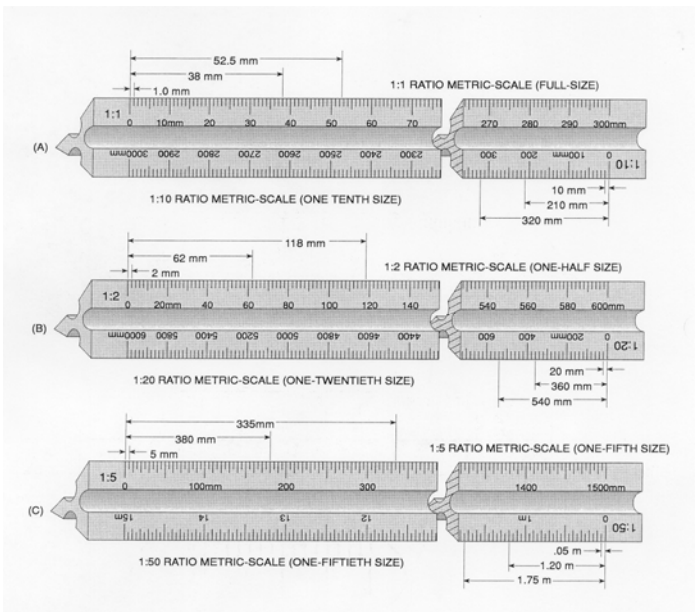
Common Metric Scales

- 1: 1 Full Size
- 1: 2 Half Size
- 1:5 1/5 Size
- 1:20 1/20 Size (can be used for 1/200 size)
- 1:331/3 LP Size
- 1:50 (can be used for 1/5 size)
- 1: 100 (can be used for full size)

Reading the Metric Scale



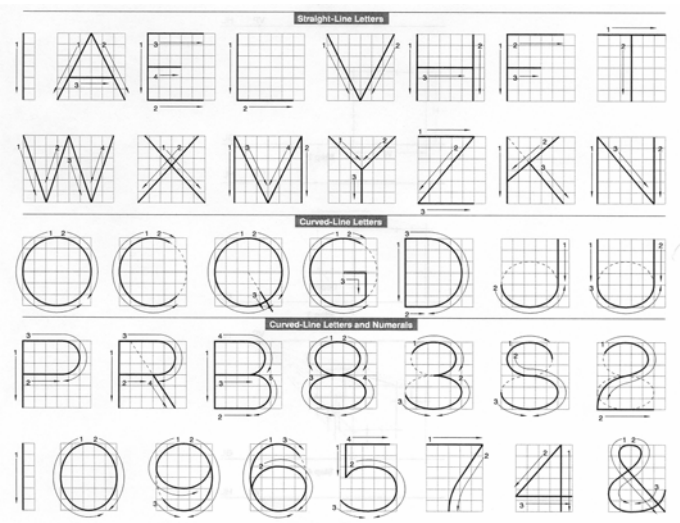
Examples of Using the Metric Scale



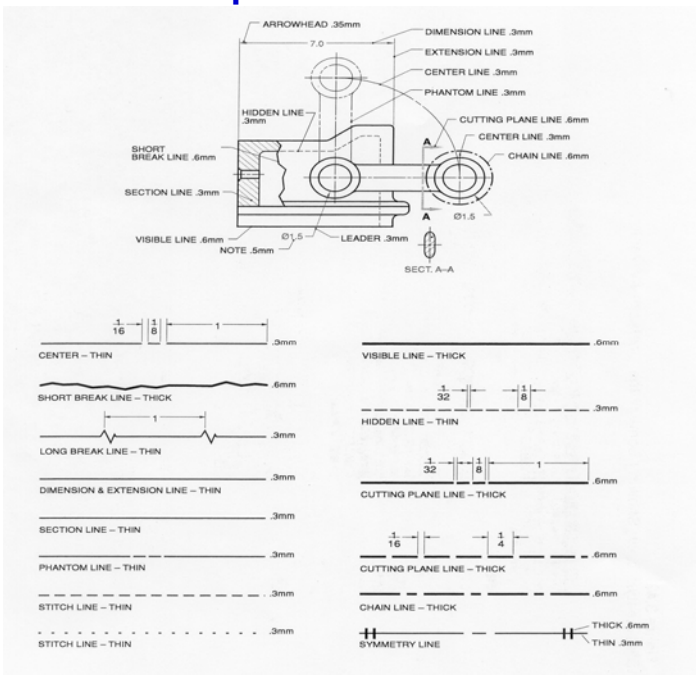
ANSI Lettering Standards

- Use Gothic Text Style Vertical or Inclined.
- Use all Capital Letters.
- Use 1/8” (3 mm) for Most Text Heights.
- Use 1/4” (6 mm) for the height of fractions.
- Determine the minimum space between lines of text by taking the text height and dividing by 2.

Vertical Gothic Lettering Guide



Alphabet of Lines



SCALES (DR-4) Completed Example

ANSWERS

24,200m	1 mm = 200 m
351 W	1" = 50 Watts
72'-4"	3/32" = 1' - 0"
14'-8"	3/8" = 1' - 0"
3'-0"	1-1/2" = 1' - 0"
8'-3 1/2"	3/4" = 1' - 0"
1,650 MI	1" = 300 miles
1'-9 1/8"	3" = 1' - 0"
570 KM	1 mm = 10 km
1,950 MI	1" = 300 m

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DR. BY: GENE McGINNIS | DATE: 9/11/02 | TITLE: SCALES
DR. FOR: CE 111 DESIGN GRAPHICS | SCALE: VARIES | DWG. NO.: DR-4