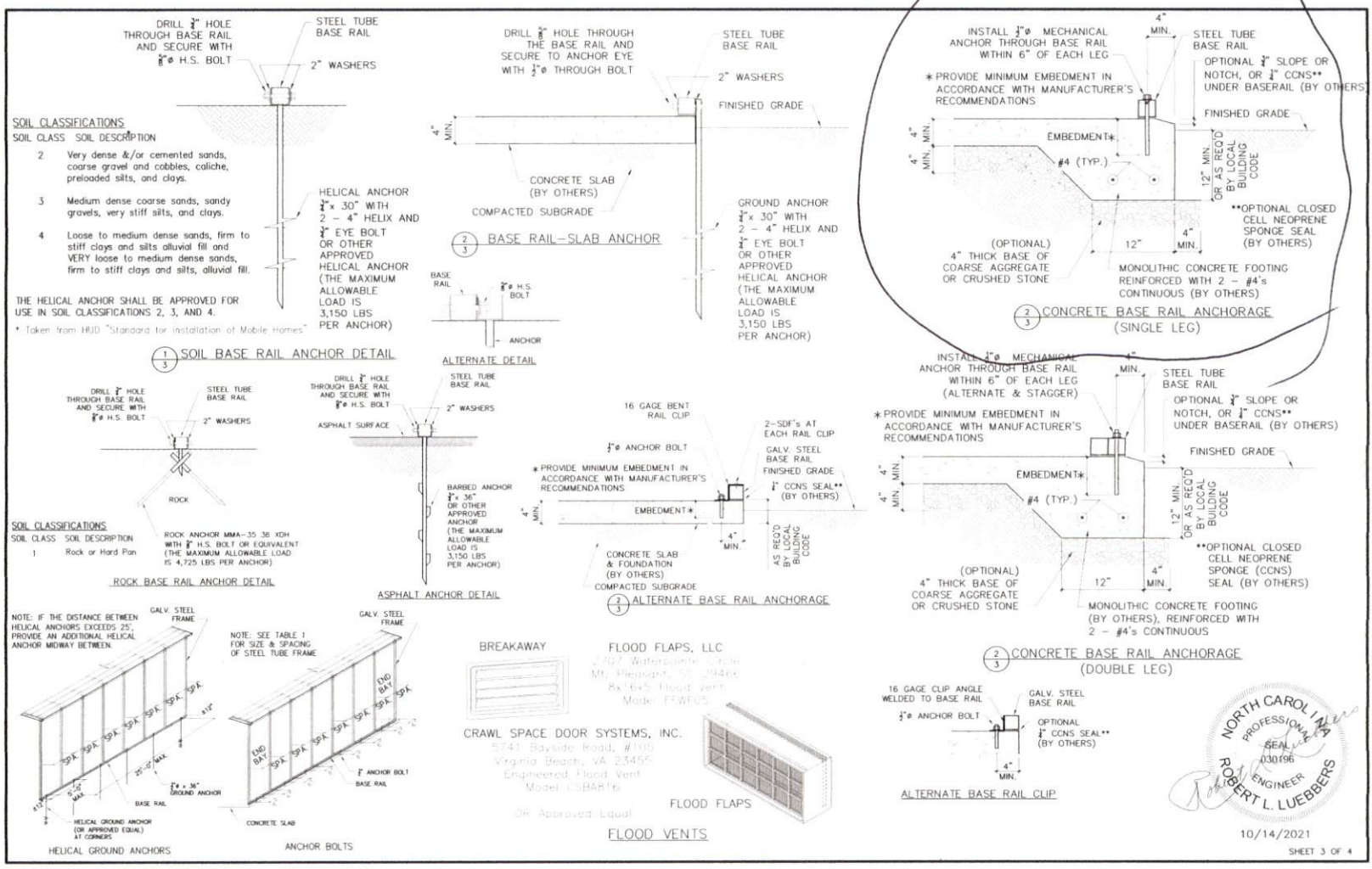
DRILL 3/8" HOLE THROUGH BASE RAIL AND SECURE WITH 3/8"ø H.S. BOLT
STEEL TUBE BASE RAIL
2" WASHERS
SOIL CLASSIFICATIONS
SOIL CLASS SOIL DESCRIPTION
2 Very dense &/or cemented sands, coarse gravel and cobbles, caliche, preloaded silts, and clays.
3 Medium dense coarse sands, sandy gravels, very stiff silts, and clays.
4 Loose to medium dense sands, firm to stiff clays and silts alluvial fill and VERY loose to medium dense sands, firm to stiff clays and silts, alluvial fill.
THE HELICAL ANCHOR SHALL BE APPROVED FOR USE IN SOIL CLASSIFICATIONS 2, 3, AND 4.
* Taken from HUD "Standard for Installation of Mobile Homes"
HELICAL ANCHOR 3/4"x 30" WITH 2 - 4" HELIX AND 3/4" EYE BOLT OR OTHER APPROVED HELICAL ANCHOR (THE MAXIMUM ALLOWABLE LOAD IS 3,150 LBS PER ANCHOR)
1/3 SOIL BASE RAIL ANCHOR DETAIL
DRILL 3/8" HOLE THROUGH THE BASE RAIL AND SECURE TO ANCHOR EYE WITH 1/2"ø THROUGH BOLT
STEEL TUBE BASE RAIL
2" WASHERS
FINISHED GRADE
4" MIN.
CONCRETE SLAB (BY OTHERS)
COMPACTED SUBGRADE
GROUND ANCHOR 3/4"x 30" WITH 2 - 4" HELIX AND 3/4" EYE BOLT OR OTHER APPROVED HELICAL ANCHOR (THE MAXIMUM ALLOWABLE LOAD IS 3,150 LBS PER ANCHOR)
2/3 BASE RAIL-SLAB ANCHOR
BASE RAIL
3/8"ø H.S. BOLT
ANCHOR
ALTERNATE DETAIL
INSTALL 1/2"ø MECHANICAL ANCHOR THROUGH BASE RAIL WITHIN 6" OF EACH LEG
4" MIN.
STEEL TUBE BASE RAIL
OPTIONAL 3/4" SLOPE OR NOTCH, OR 1/4" CCNS** UNDER BASERAIL (BY OTHERS)
* PROVIDE MINIMUM EMBEDMENT IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS
FINISHED GRADE
EMBEDMENT*
#4 (TYP.)
4" MIN.
12" MIN. OR AS REQ'D BY LOCAL BUILDING CODE
**OPTIONAL CLOSED CELL NEOPRENE SPONGE SEAL (BY OTHERS)
(OPTIONAL) 4" THICK BASE OF COARSE AGGREGATE OR CRUSHED STONE
12"
MONOLITHIC CONCRETE FOOTING REINFORCED WITH 2 - #4's CONTINUOUS (BY OTHERS)
2/3 CONCRETE BASE RAIL ANCHORAGE (SINGLE LEG)
DRILL 3/8" HOLE THROUGH BASE RAIL AND SECURE WITH 3/8"ø H.S. BOLT
STEEL TUBE BASE RAIL
2" WASHERS
ROCK
SOIL CLASSIFICATIONS
SOIL CLASS SOIL DESCRIPTION
1 Rock or Hard Pan
ROCK ANCHOR MMA-35 36 XDH WITH 3/8" H.S. BOLT OR EQUIVALENT (THE MAXIMUM ALLOWABLE LOAD IS 4,725 LBS PER ANCHOR)
ROCK BASE RAIL ANCHOR DETAIL
DRILL 3/8" HOLE THROUGH BASE RAIL AND SECURE WITH 3/8"ø H.S. BOLT
STEEL TUBE BASE RAIL
2" WASHERS
ASPHALT SURFACE
BARBED ANCHOR 3/8"x 36" OR OTHER APPROVED ANCHOR (THE MAXIMUM ALLOWABLE LOAD IS 3,150 LBS PER ANCHOR)
ASPHALT ANCHOR DETAIL
16 GAGE BENT RAIL CLIP
2-SDF's AT EACH RAIL CLIP
1/2"ø ANCHOR BOLT
GALV. STEEL BASE RAIL
FINISHED GRADE
* PROVIDE MINIMUM EMBEDMENT IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS
1/4" CCNS SEAL** (BY OTHERS)
EMBEDMENT*
4" MIN.
AS REQ'D BY LOCAL BUILDING CODE
CONCRETE SLAB & FOUNDATION (BY OTHERS)
COMPACTED SUBGRADE
2/3 ALTERNATE BASE RAIL ANCHORAGE
INSTALL 1/2"ø MECHANICAL ANCHOR THROUGH BASE RAIL WITHIN 6" OF EACH LEG (ALTERNATE & STAGGER)
4" MIN.
STEEL TUBE BASE RAIL
OPTIONAL 3/4" SLOPE OR NOTCH, OR 1/4" CCNS** UNDER BASERAIL (BY OTHERS)
* PROVIDE MINIMUM EMBEDMENT IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS
FINISHED GRADE
EMBEDMENT*
#4 (TYP.)
4" MIN.
12" MIN. OR AS REQ'D BY LOCAL BUILDING CODE
**OPTIONAL CLOSED CELL NEOPRENE SPONGE (CCNS) SEAL (BY OTHERS)
(OPTIONAL) 4" THICK BASE OF COARSE AGGREGATE OR CRUSHED STONE
12"
MONOLITHIC CONCRETE FOOTING (BY OTHERS), REINFORCED WITH 2 - #4's CONTINUOUS
2/3 CONCRETE BASE RAIL ANCHORAGE (DOUBLE LEG)
16 GAGE CLIP ANGLE WELDED TO BASE RAIL
GALV. STEEL BASE RAIL
1/2"ø ANCHOR BOLT
OPTIONAL 1/4" CCNS SEAL** (BY OTHERS)
4" MIN.
ALTERNATE BASE RAIL CLIP
NOTE: IF THE DISTANCE BETWEEN HELICAL ANCHORS EXCEEDS 25', PROVIDE AN ADDITIONAL HELICAL ANCHOR MIDWAY BETWEEN.
GALV. STEEL FRAME
5'-0" MAX.
25'-0" MAX.
3/8"ø x 36" GROUND ANCHOR
BASE RAIL
HELICAL GROUND ANCHOR (OR APPROVED EQUAL) AT CORNERS
HELICAL GROUND ANCHORS
NOTE: SEE TABLE 1 FOR SIZE & SPACING OF STEEL TUBE FRAME
GALV. STEEL FRAME
END BAY
3/8" ANCHOR BOLT
BASE RAIL
CONCRETE SLAB
ANCHOR BOLTS
BREAKAWAY
FLOOD FLAPS, LLC
2767 Waterpointe Circle
Mt. Pleasant, SC 29466
8x16x5 Flood Vent
Model: FFWF05
CRAWL SPACE DOOR SYSTEMS, INC.
5741 Bayside Road, #105
Virginia Beach, VA 23455
Engineered Flood Vent
Model: CSBAR16
OR Approved Equal
FLOOD FLAPS
FLOOD VENTS
NORTH CAROLINA PROFESSIONAL SEAL 030196 ENGINEER ROBERT L. LUEBBERS
10/14/2021
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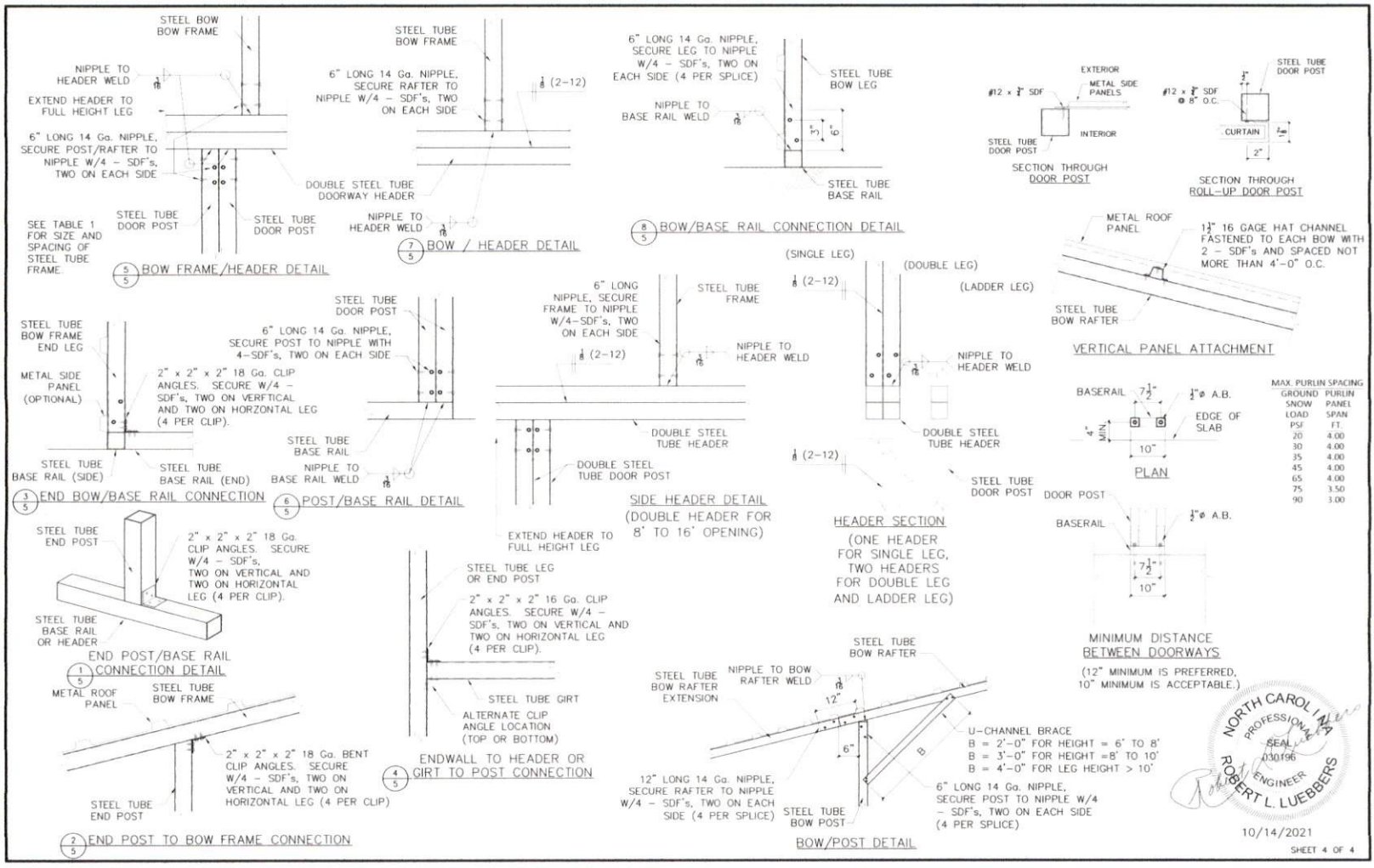
STEEL BOW BOW FRAME
NIPPLE TO HEADER WELD
EXTEND HEADER TO FULL HEIGHT LEG
6" LONG 14 Ga. NIPPLE, SECURE POST/RAFTER TO NIPPLE W/4 – SDF's, TWO ON EACH SIDE
SEE TABLE 1 FOR SIZE AND SPACING OF STEEL TUBE FRAME
STEEL TUBE DOOR POST
STEEL TUBE DOOR POST
5/5 BOW FRAME/HEADER DETAIL
STEEL TUBE BOW FRAME
6" LONG 14 Ga. NIPPLE, SECURE RAFTER TO NIPPLE W/4 – SDF's, TWO ON EACH SIDE
1/8 (2-12)
DOUBLE STEEL TUBE DOORWAY HEADER
NIPPLE TO HEADER WELD
7/5 BOW / HEADER DETAIL
6" LONG 14 Ga. NIPPLE, SECURE LEG TO NIPPLE W/4 – SDF's, TWO ON EACH SIDE (4 PER SPLICE)
STEEL TUBE BOW LEG
NIPPLE TO BASE RAIL WELD
3"
6"
STEEL TUBE BASE RAIL
8/5 BOW/BASE RAIL CONNECTION DETAIL
EXTERIOR
METAL SIDE PANELS
#12 x 3/4" SDF
INTERIOR
STEEL TUBE DOOR POST
SECTION THROUGH DOOR POST
STEEL TUBE DOOR POST
#12 x 3/4" SDF @ 8" O.C.
CURTAIN
2"
SECTION THROUGH ROLL-UP DOOR POST
METAL ROOF PANEL
1 1/2" 16 GAGE HAT CHANNEL FASTENED TO EACH BOW WITH 2 – SDF's AND SPACED NOT MORE THAN 4'-0" O.C.
STEEL TUBE BOW RAFTER
VERTICAL PANEL ATTACHMENT
STEEL TUBE BOW FRAME END LEG
METAL SIDE PANEL (OPTIONAL)
2" x 2" x 2" 18 Ga. CLIP ANGLES. SECURE W/4 – SDF's, TWO ON VERFTICAL AND TWO ON HORZONTAL LEG (4 PER CLIP).
STEEL TUBE BASE RAIL (SIDE)
STEEL TUBE BASE RAIL (END)
3/5 END BOW/BASE RAIL CONNECTION
STEEL TUBE DOOR POST
6" LONG 14 Ga. NIPPLE, SECURE POST TO NIPPLE WITH 4-SDF's, TWO ON EACH SIDE
STEEL TUBE BASE RAIL
NIPPLE TO BASE RAIL WELD
6/5 POST/BASE RAIL DETAIL
6" LONG NIPPLE, SECURE FRAME TO NIPPLE W/4-SDF's, TWO ON EACH SIDE
STEEL TUBE FRAME
NIPPLE TO HEADER WELD
1/8 (2-12)
DOUBLE STEEL TUBE HEADER
DOUBLE STEEL TUBE DOOR POST
EXTEND HEADER TO FULL HEIGHT LEG
SIDE HEADER DETAIL
(DOUBLE HEADER FOR 8' TO 16' OPENING)
(SINGLE LEG)
(DOUBLE LEG)
(LADDER LEG)
1/8 (2-12)
NIPPLE TO HEADER WELD
DOUBLE STEEL TUBE HEADER
1/8 (2-12)
STEEL TUBE DOOR POST
HEADER SECTION
(ONE HEADER FOR SINGLE LEG, TWO HEADERS FOR DOUBLE LEG AND LADDER LEG)
BASERAIL
7 1/2"
1/2"ø A.B.
EDGE OF SLAB
4" MIN.
10"
PLAN
MAX. PURLIN SPACING
GROUND SNOW LOAD PSF
PURLIN PANEL SPAN FT.
20 4.00
30 4.00
35 4.00
45 4.00
65 4.00
75 3.50
90 3.00
DOOR POST
BASERAIL
1/2"ø A.B.
7 1/2"
10"
MINIMUM DISTANCE BETWEEN DOORWAYS
(12" MINIMUM IS PREFERRED, 10" MINIMUM IS ACCEPTABLE.)
STEEL TUBE END POST
2" x 2" x 2" 18 Ga. CLIP ANGLES. SECURE W/4 – SDF's, TWO ON VERTICAL AND TWO ON HORIZONTAL LEG (4 PER CLIP).
STEEL TUBE BASE RAIL OR HEADER
END POST/BASE RAIL CONNECTION DETAIL
1/5
METAL ROOF PANEL
STEEL TUBE BOW FRAME
2" x 2" x 2" 18 Ga. BENT CLIP ANGLES. SECURE W/4 – SDF's, TWO ON VERTICAL AND TWO ON HORIZONTAL LEG (4 PER CLIP)
STEEL TUBE END POST
2/5 END POST TO BOW FRAME CONNECTION
STEEL TUBE LEG OR END POST
2" x 2" x 2" 16 Ga. CLIP ANGLES. SECURE W/4 – SDF's, TWO ON VERTICAL AND TWO ON HORIZONTAL LEG (4 PER CLIP).
STEEL TUBE GIRT
ALTERNATE CLIP ANGLE LOCATION (TOP OR BOTTOM)
ENDWALL TO HEADER OR GIRT TO POST CONNECTION
4/5
STEEL TUBE BOW RAFTER
NIPPLE TO BOW RAFTER WELD
STEEL TUBE BOW RAFTER EXTENSION
12"
6"
B
U-CHANNEL BRACE
B = 2'-0" FOR HEIGHT = 6' TO 8'
B = 3'-0" FOR HEIGHT =8' TO 10'
B = 4'-0" FOR LEG HEIGHT > 10'
12" LONG 14 Ga. NIPPLE, SECURE RAFTER TO NIPPLE W/4 – SDF's, TWO ON EACH SIDE (4 PER SPLICE)
STEEL TUBE BOW POST
6" LONG 14 Ga. NIPPLE, SECURE POST TO NIPPLE W/4 – SDF's, TWO ON EACH SIDE (4 PER SPLICE)
BOW/POST DETAIL
NORTH CAROLINA PROFESSIONAL SEAL 030196 ENGINEER ROBERT L. LUEBBERS
10/14/2021
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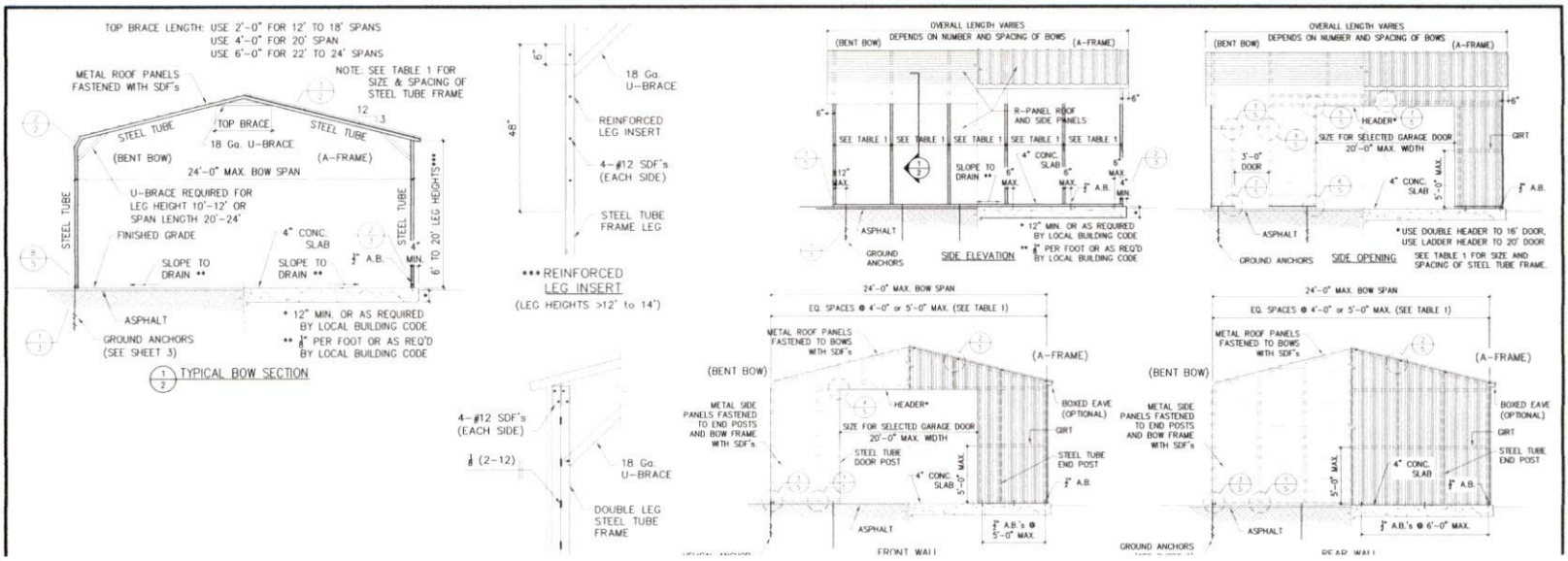
TOP BRACE LENGTH: USE 2'-0" FOR 12' TO 18' SPANS
USE 4'-0" FOR 20' SPAN
USE 6'-0" FOR 22' TO 24' SPANS
NOTE: SEE TABLE 1 FOR SIZE & SPACING OF STEEL TUBE FRAME
METAL ROOF PANELS FASTENED WITH SDF's
STEEL TUBE
TOP BRACE
18 Ga. U-BRACE
(BENT BOW)
(A-FRAME)
24'-0" MAX. BOW SPAN
U-BRACE REQUIRED FOR LEG HEIGHT 10'-12' OR SPAN LENGTH 20'-24'
FINISHED GRADE
4" CONC. SLAB
SLOPE TO DRAIN **
3/4" A.B.
MIN.
6' TO 20' LEG HEIGHTS***
ASPHALT
GROUND ANCHORS (SEE SHEET 3)
* 12" MIN. OR AS REQUIRED BY LOCAL BUILDING CODE
** 3/8" PER FOOT OR AS REQ'D BY LOCAL BUILDING CODE
1/2 TYPICAL BOW SECTION
48"
6"
18 Ga. U-BRACE
REINFORCED LEG INSERT
4-#12 SDF's (EACH SIDE)
STEEL TUBE FRAME LEG
*** REINFORCED LEG INSERT
(LEG HEIGHTS >12' to 14')
4-#12 SDF's (EACH SIDE)
3/8 (2-12)
18 Ga. U-BRACE
DOUBLE LEG STEEL TUBE FRAME
OVERALL LENGTH VARIES
DEPENDS ON NUMBER AND SPACING OF BOWS
R-PANEL ROOF AND SIDE PANELS
SEE TABLE 1
SLOPE TO DRAIN **
SIDE ELEVATION
HEADER*
SIZE FOR SELECTED GARAGE DOOR 20'-0" MAX. WIDTH
3'-0" DOOR
GIRT
5'-0" MAX.
*USE DOUBLE HEADER TO 16' DOOR, USE LADDER HEADER TO 20' DOOR
SIDE OPENING
SEE TABLE 1 FOR SIZE AND SPACING OF STEEL TUBE FRAME
24'-0" MAX. BOW SPAN
EQ. SPACES @ 4'-0" or 5'-0" MAX. (SEE TABLE 1)
METAL ROOF PANELS FASTENED TO BOWS WITH SDF's
METAL SIDE PANELS FASTENED TO END POSTS AND BOW FRAME WITH SDF's
BOXED EAVE (OPTIONAL)
STEEL TUBE DOOR POST
STEEL TUBE END POST
3/4" A.B.'s @ 5'-0" MAX.
FRONT WALL
3/4" A.B.'s @ 6'-0" MAX.
REAR WALL