

ABBREVIATIONS	ABBREV
NOTE: ABBREVIATIONS MAY OR MAY NOT HAVE PERIODS, BUT SHALL BE READ AS SAME.	
A.B.	ANCHOR BOLT
A.B.C.	AGGREGATE BASE COURSE
ACI	AMERICAN CONCRETE INSTITUTE
A/C	AIR CONDITIONER
A.F.F.	ABOVE FINISHED FLOOR
AISC	AMERICAN INSTITUTE OF STEEL CONSTRUCTION
AISI	AMERICAN IRON AND STEEL INSTITUTE
AITC	AMERICAN INSTITUTE OF TIMBER CONSTRUCTION
ALT.	ALTERNATE
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE
APA	AMERICAN PLYWOOD ASSOCIATION
ARCH'L	ARCHITECTURAL
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS
AWS	AMERICAN WELDING SOCIETY
A.W.H.S.	AUTOMATIC WELDED HEADED STUDS
A.W.T.S.	AUTOMATIC WELDED THREADED STUDS
BM	BEAM
B.F.F.	BELOW FINISHED FLOOR
BLK	BLOCK
B.O.B.	BOTTOM OF BEAM
B.O.D.	BOTTOM OF DECK
B.O.F.	BOTTOM OF FOOTING
BRG	BEARING
C	CAMBER
C.C.	CENTERLINE TO CENTERLINE
CFS	COLD FORMED STEEL
C.G.	CENTER OF GRAVITY
C.I.P.	CAST IN PLACE
C.L.	CENTERLINE
C.L.B.	CENTERLINE OF BEAM
C.L.C.	CENTERLINE OF COLUMN
C.L.F.	CENTERLINE OF FOOTING
C.L.W.	CENTERLINE OF WALL
CL	CLEAR
CONC	CONCRETE
CONC C.J.	CONCRETE CONTROL JOINT
CONC S.J.	CONCRETE SAWCUT JOINT
C.M.U.	CONCRETE MASONRY UNIT
CONN	CONNECTION
CONT	CONTINUOUS
CRSI	CONCRETE REINFORCING STEEL INSTITUTE
D.F. (D.F.L.)	DOUGLAS FIR LARCH
DI	DIAMETER
DIA	DIAMETER
DN	DOWN
DWG(S)	DRAWING(S)
E.C.	END TO CENTERLINE
E.E.	END TO END
E.O.S.	EDGE OF SLAB
EQ	EQUAL
EQUIP	EQUIPMENT
EXP. BOLT (E.B.)	EXPANSION BOLT
EXP. JT (E.J.)	EXPANSION JOINT
E.W.	EACH WAY
F.F.	FINISHED FLOOR
F.O.M.	FACE OF MEMBER
F.O.S.	FACE OF STEEL
F.O.W.	FACE OF WALL
GA	GAGE (UNIT OF MEASUREMENT)
GALV	GALVANIZED
G.S.N.	GENERAL STRUCTURAL NOTES
GLB (GLULAM)	GLUED-LAMINATED BEAM
H.F.	HEM FIR
HORIZ	HORIZONTAL REINFORCING
H.S.	HEADED STUDS
IBC	INTERNATIONAL BUILDING CODE
ICBO	INTERNATIONAL CONFERENCE OF BUILDING OFFICIALS
ICC	INTERNATIONAL CODE COUNCIL
ICF	INSULATED CONCRETE FORMS
I.F.W.	INSIDE FACE OF WALL
I.O.D.	INTERPRETATION OF DRAWINGS
JST	JOIST
K(KIP)	1000 POUNDS
KLF	KIPS PER LINEAR FOOT
LBS (#)	POUNDS
LGR	LEADER
LGS	LIGHT GAGE STEEL
LOSEA	LIGHT GAGE STEEL ENGINEERS ASSOCIATION
L.O.D.	LOCATION OF DETAILS
LL	LIVE LOAD
LLH	LONG LEG HORIZONTAL
LLV	LONG LEG VERTICAL
MAS	MASONRY
MAS C.J.	MASONRY CONTROL JOINT
MAX	MAXIMUM
MBMA	METAL BUILDING MANUFACTURERS ASSOCIATION
MECH'L	MECHANICAL
MFR'D	MANUFACTURED
MFR(S)	MANUFACTURER(S)
MIN	MINIMUM
N/A	NOT APPLICABLE
N.T.S.	NOT TO SCALE
O.C.	ON CENTER
O.F.W.	OUTSIDE FACE OF WALL
OPP	OPPOSITE
OSHA	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
PAF	POWDER ACTUATED FASTENER
PDPAT	SIMPSON POWDER DRIVEN PIN
PDPT	SIMPSON POWDER DRIVEN PIN WITH TOP HAT (0.300" HEAD)
PCI	PRECAST/PRESTRESSED CONCRETE INSTITUTE
P.C.	PRECAST CONCRETE
PCF	POUNDS PER CUBIC FOOT
PLF	POUNDS PER LINEAR FOOT
±	PLUS OR MINUS
PREFAB	PREFABRICATED
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PT	POST-TENSIONED
REINF	REINFORCING
SDI	STEEL DECK INSTITUTE
SLH	SHORT LEG HORIZONTAL
SLV	SHORT LEG VERTICAL
SJI	STEEL JOIST INSTITUTE
SIM	SIMILAR
SO	SQUARE
SSMA	STEEL STUD MANUFACTURERS ASSOCIATION
STD	STANDARD
STL	STEEL
TL	TOTAL LOAD
T.O.B.	TOP OF BEAM
T.O.C.T.	TOP OF CONCRETE TOPPING
T.O.D.	TOP OF DECK
T.O.F.	TOP OF FOOTING
T.O.L.	TOP OF LEDGER
T.O.M.	TOP OF MASONRY
T.O.P.	TOP OF PLATE
T.O.P.C.	TOP OF PRECAST CONCRETE
T.O.S.	TOP OF STEEL
T.O.W.	TOP OF WALL
TP	TRUSS PLATE INSTITUTE
TYP	TYPICAL
T&G	TONGUE AND GROOVE
UBC	UNIFORM BUILDING CODE
U.N.O.	UNLESS NOTED OTHERWISE
VERT	VERTICAL REINFORCING
WCLA	WEST COAST LUMBER ASSOCIATION
WCLB	WEST COAST LUMBER INSPECTION BUREAU
W.W.F.	WELDED WIRE FABRIC
WWPA	WESTERN WOOD PRODUCTS ASSOCIATION
W/	WITH
W/C	WATER TO CEMENT RATIO
W/O	WITHOUT

GENERAL STRUCTURAL NOTES

BUILDING CODE:

2018 EDITION OF THE INTERNATIONAL BUILDING CODE WITH CITY OF ST. LOUIS AMENDMENTS.

LOADS:

GRAVITY:

ROOF LIVE LOAD = 12 PSF (PER IBC 1607.13.5.2.1)
ROOF SNOW LOAD, P_f = 20 PSF (NON-REDUCIBLE).
CANOPY DEAD LOAD = ACTUAL WEIGHT OF MEMBER.
SOLAR PANEL, CONDUITS, ETC. = 3.0 PSF
PURLIN = 1.0 PSF
BEAM = 3.0 PSF
GIRDER = 3.0 PSF

ROOF DEAD LOAD = 10.0 PSF

LATERAL:

WIND:

ULTIMATE DESIGN WIND SPEED (3-SECOND GUST), V = 106 MPH.
RISK CATEGORY, II.
EXPOSURE C.

WIND LOAD FOR 3 DEGREE MAX SLOPE: (ULTIMATE)
C&O WIND LOAD = 25.0 PSF (TOWARD THE SURFACE).
C&C WIND LOAD = 25.4 PSF (AWAY FROM THE SURFACE).
MWRS WIND LOAD = 23.5 PSF / 5.9 PSF (TOWARD THE SURFACE).
MWRS WIND LOAD = 23.5 PSF / -9.8 PSF (AWAY FROM THE SURFACE).

SEISMIC:

SEISMIC IMPORTANCE FACTOR, I = 1.0.
RISK CATEGORY, II.
MAPPED SHORT PERIOD SPECTRAL ACCELERATION, S_s = .440g.
MAPPED ONE SECOND SPECTRAL ACCELERATION, S_1 = .158g.
SOIL SITE CLASS, D.
DESIGN SHORT PERIOD SPECTRAL ACCELERATION, S_{ds} = .381g.
DESIGN ONE SECOND SPECTRAL ACCELERATION, S_{d1} = .158g.
SEISMIC DESIGN CATEGORY, C.
BASIC SEISMIC-FORCE-RESISTING SYSTEM = ORDINARY STEEL MOMENT FRAMES.
SEISMIC RESPONSE COEFFICIENT, C_s = .109.
RESPONSE MODIFICATION FACTOR (R) = 3.5.
ANALYSIS PROCEDURE USED = EQUIVALENT LATERAL FORCE PROCEDURE

STRUCTURAL STEEL:

GENERAL:

ALL CONSTRUCTION PER LATEST AISC STEEL CONSTRUCTION MANUAL. ALL WIDE FLANGE STEEL SHALL BE ASTM A992 (F_y = 50 KSI). ALL PIPE STEEL SHALL BE ASTM A500 (F_y = 42 KSI) OR ASTM A53, TYPE E OR S, GRADE B (F_y = 35 KSI). ALL TUBE STEEL SHALL BE ASTM A500 (F_y = 46 KSI). ALL MISCELLANEOUS STEEL UNLESS NOTED OTHERWISE SHALL BE ASTM A36 (F_y = 36 KSI). IF CALLED OUT ON PLANS, F_y = 50 KSI PLATE STEEL SHALL BE ASTM A529 OR A572. THE TERMS PIPE AND ROUND HOLLOW STRUCTURAL SHAPE (HSS) ARE USED SYNONYMOUSLY THROUGHOUT THESE DOCUMENTS ALONG WITH THE TERMS TUBE STEEL AND RECTANGULAR OR SQUARE HSS.

ALL STRUCTURAL ROLLED STEEL MEMBERS WITH F_y GREATER THAN 36 KSI ARE TO BE IDENTIFIED WITH AN ASTM SPECIFICATION MARK OR TAG PER IBC SEC. 2203.1.

BOLTS:

UNLESS NOTED OTHERWISE, ALL BOLTS SHALL BE ASTM A325N (F3125). ALL BOLTS SHALL BE INSTALLED WITH STEEL WASHERS AT SHORT SLOTTED HOLES USING SNUG TIGHT INSTALLATION, UNLESS NOTED OTHERWISE.

WELDING:

UNLESS NOTED OTHERWISE, ALL WELDS PER LATEST EDITION OF THE AWS STANDARDS. ALL WELDING SHALL BE PERFORMED BY WELDERS HOLDING VALID CERTIFICATES AND HAVING CURRENT EXPERIENCE IN THE TYPE OF WELD SHOWN ON THE DRAWINGS OR NOTES. CERTIFICATES SHALL BE THOSE ISSUED BY AN ACCEPTED TESTING AGENCY. ALL WELDING DONE BY E70 SERIES UNLESS NOTED OTHERWISE. FOR GRADE 60 REINFORCING BARS, USE E80 SERIES. THESE DRAWINGS DO NOT DISTINGUISH BETWEEN SHOP AND FIELD WELDS; THE CONTRACTOR MAY SHOP WELD OR FIELD WELD AT THEIR DISCRETION. SHOP WELDS AND FIELD WELDS SHALL BE SHOWN ON THE SHOP DRAWINGS SUBMITTED FOR REVIEW.

ALL FULL (COMPLETE) PENETRATION WELDS SHALL BE TESTED AND CERTIFIED BY AN INDEPENDENT TESTING LABORATORY.

ALL SPOT WELDS SHALL BE PER LATEST AISI AND AWS STANDARDS.

SCREW FASTENERS:

ALL SCREWS 3/4" MIN. LENGTH U.N.O.

ALL STEEL SCREWS SHALL BE IN ACCORDANCE WITH AISI-GENERAL AND AISI-NAS. F_y = 50 ksi AND F_t = 70 ksi FOR ALL SCREWS.

1. MINIMUM SPACING OF SCREWS SHALL NOT BE LESS THAN 3 TIMES THE NOMINAL DIAMETER.
MINIMUM EDGE DISTANCE FOR SCREWS SHALL NOT BE LESS THAN 1.5 TIMES THE NOMINAL DIAMETER.
2. THE HEAD OF THE SCREW OR WASHER SHALL HAVE A DIAMETER, D_w , OF NOT LESS THAN $5/16"$. WASHERS SHALL BE AT LEAST 0.05" THICK.

SCREW NUMBER DESIGNATION	8	10	12 (12-14)	14
NOMINAL DIAMETER	0.164"	0.190"	0.216"	0.250"

COLD FORMED STRUCTURAL STEEL FRAMING:

GENERAL:

ALL COLD FORMED STRUCTURAL STEEL FRAMING AND COMPONENTS INDICATED ON THE STRUCTURAL DRAWINGS SHALL BE FABRICATED AND ERECTED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND IN ACCORDANCE WITH THE LATEST EDITION OF AISI'S "SPECIFICATIONS FOR THE DESIGN OF COLD FORMED STEEL STRUCTURAL MEMBERS".

FRAMING:

ALL WELDING TO BE PERFORMED BY WELDERS HOLDING A VALID CERTIFICATE AND HAVING CURRENT EXPERIENCE IN LIGHT GAUGE STEEL. CERTIFICATES SHALL BE ISSUED BY AN ACCEPTED TESTING AGENCY. DO NOT NOTCH FLANGES OF MEMBERS WITHOUT EXPRESSED APPROVAL OF THE ENGINEER OF RECORD. ALL WELDING TO BE PERFORMED IN AN APPROVED FABRICATORS SHOP.

COLD FORMED STRUCTURAL STEEL MEMBERS SHALL HAVE A MINIMUM YIELD STRENGTH OF F_y = 55,000 PSI. COLD FORM STRUCTURAL STEEL SHALL BE GALVANIZED PER ASTM A653 WITH A MINIMUM COATING DESIGNATION OF G90. THE GRADE AND THE ASTM SPECIFICATION NUMBER OR OTHER SPECIFICATION DESIGNATION SHALL BE INDICATED BY PAINTING, DECAL, TAGGING OR OTHER SUITABLE MEANS ON EACH BUNDLE OF FABRICATED ELEMENTS. IT IS ACCEPTABLE TO USE THE F_y SHOWN ON THE MILL CERTIFICATION IN LIEU OF THE "ORDERED" F_y .

THE STEEL PURLINS DO NOT HAVE TO BEAR DIRECTLY ON THE STEEL BEAMS. IT IS ACCEPTABLE AND COMMON FOR THE PURLINS TO NEED TO BE RAISED A LITTLE (1/2" MAXIMUM) TO ASSIST IN LEVELING AND "TUNING" THE STRUCTURE. THE LOAD BETWEEN THE PURLIN AND THE BEAM IS TRANSFERRED ENTIRELY THROUGH THE SCREWS CONNECTING THE PURLIN TO THE PURLIN CLIP. THE PURLIN DOES NOT NEED TO BEAR ON THE BEAM.

MILS	GAGE NO.	MIN DELIVERED THICKNESS	DESIGN THICKNESS
12	30	0.0120"	0.0126"
14	29	0.0132"	0.0139"
16	26	0.0174"	0.0183"
33	20	0.0336"	0.0354"
43	18	0.0447"	0.0470"
54	16	0.0561"	0.0590"
68	14	0.0713"	0.0750"
97	12	0.0998"	0.1050"
118	10	0.1283"	0.1350"
150	9	0.1430"	0.1500"

GENERAL NOTES:

THE STRUCTURAL CONSTRUCTION DOCUMENTS REPRESENT THE FINISHED STRUCTURE. EXCEPT WHERE NOTED, THEY DO NOT INDICATE THE METHOD OF CONSTRUCTION. THE CONTRACTOR SHALL PROVIDE ALL MEASURES NECESSARY TO PROTECT THE STRUCTURE DURING CONSTRUCTION. SUCH MEASURES SHALL INCLUDE, BUT NOT BE LIMITED TO, BRACING, SHORING FOR LOADS DUE TO CONSTRUCTION EQUIPMENT, ETC. THE STRUCTURAL ENGINEER OF RECORD SHALL NOT BE RESPONSIBLE FOR THE CONTRACTOR'S MEANS, METHODS, TECHNIQUES, SEQUENCES FOR PROCEDURE OF CONSTRUCTION, OR THE SAFETY PRECAUTIONS AND THE PROGRAMS INCIDENT THERETO (NOR SHALL OBSERVATION VISITS TO THE SITE INCLUDE INSPECTION OF THESE ITEMS).

WHERE REFERENCE IS MADE TO VARIOUS TEST STANDARDS FOR MATERIALS, SUCH STANDARDS SHALL BE THE LATEST EDITION AND/OR ADDENDA. ANY ENGINEERING DESIGN, PROVIDED BY OTHERS AND SUBMITTED FOR REVIEW, SHALL BEAR THE SEAL OF A REGISTERED ENGINEER RECOGNIZED BY THE BUILDING CODE JURISDICTION OF THIS PROJECT.

NOTES AND DETAILS ON DRAWINGS SHALL TAKE PRECEDENCE OVER GENERAL STRUCTURAL NOTES AND TYPICAL DETAILS. WHERE NO DETAILS ARE SHOWN, CONSTRUCTION SHALL CONFORM TO SIMILAR WORK ON THE PROJECT, AND/OR AS PROVIDED FOR IN THE CONTRACT DOCUMENTS. WHERE DISCREPANCIES OCCUR BETWEEN PLANS, DETAILS, GENERAL STRUCTURAL NOTES AND SPECIFICATIONS, THE GREATER REQUIREMENTS SHALL GOVERN.

CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFICATION OF ALL DIMENSIONS AND SHALL RESOLVE ANY DISCREPANCY PRIOR TO START OF CONSTRUCTION. WITH THE ARCHITECT, ESTABLISH AND VERIFY ALL OPENINGS AND INSERTS FOR CIVIL, PLUMBING AND ELECTRICAL ITEMS WITH THE APPROPRIATE TRADE DRAWINGS AND SUBCONTRACTORS PRIOR TO CONSTRUCTION.

TYPICAL DETAILS MAY NOT NECESSARILY BE CUT ON PLANS, BUT APPLY UNLESS NOTED OTHERWISE.

CONSTRUCTION MATERIALS SHALL BE SPREAD OUT IF PLACED ON FRAMED CONSTRUCTION. LOAD SHALL NOT EXCEED THE DESIGN LIVE LOAD PER SQUARE FOOT.

OPTIONS ARE FOR CONTRACTOR'S CONVENIENCE. IF AN OPTION IS CHOSEN, CONTRACTOR SHALL BE RESPONSIBLE FOR ALL NECESSARY CHANGES, APPROVALS AND THE COORDINATION OF THE WORK WITH ALL RELATED TRADES AND SUPPLIERS.

SPECIAL INSPECTION – STRUCTURAL ONLY:

(IF REQUIRED BY THE JURISDICTION HAVING AUTHORITY):

SPECIAL INSPECTIONS SHALL BE PERFORMED UNDER THE DIRECT SUPERVISION OF A STATE REGISTERED STRUCTURAL ENGINEER WHO IS FAMILIAR WITH THE STRUCTURAL DESIGN OF THIS PROJECT. THE SUPERVISING STRUCTURAL ENGINEER SHALL SEAL THE SPECIAL INSPECTION CERTIFICATE.

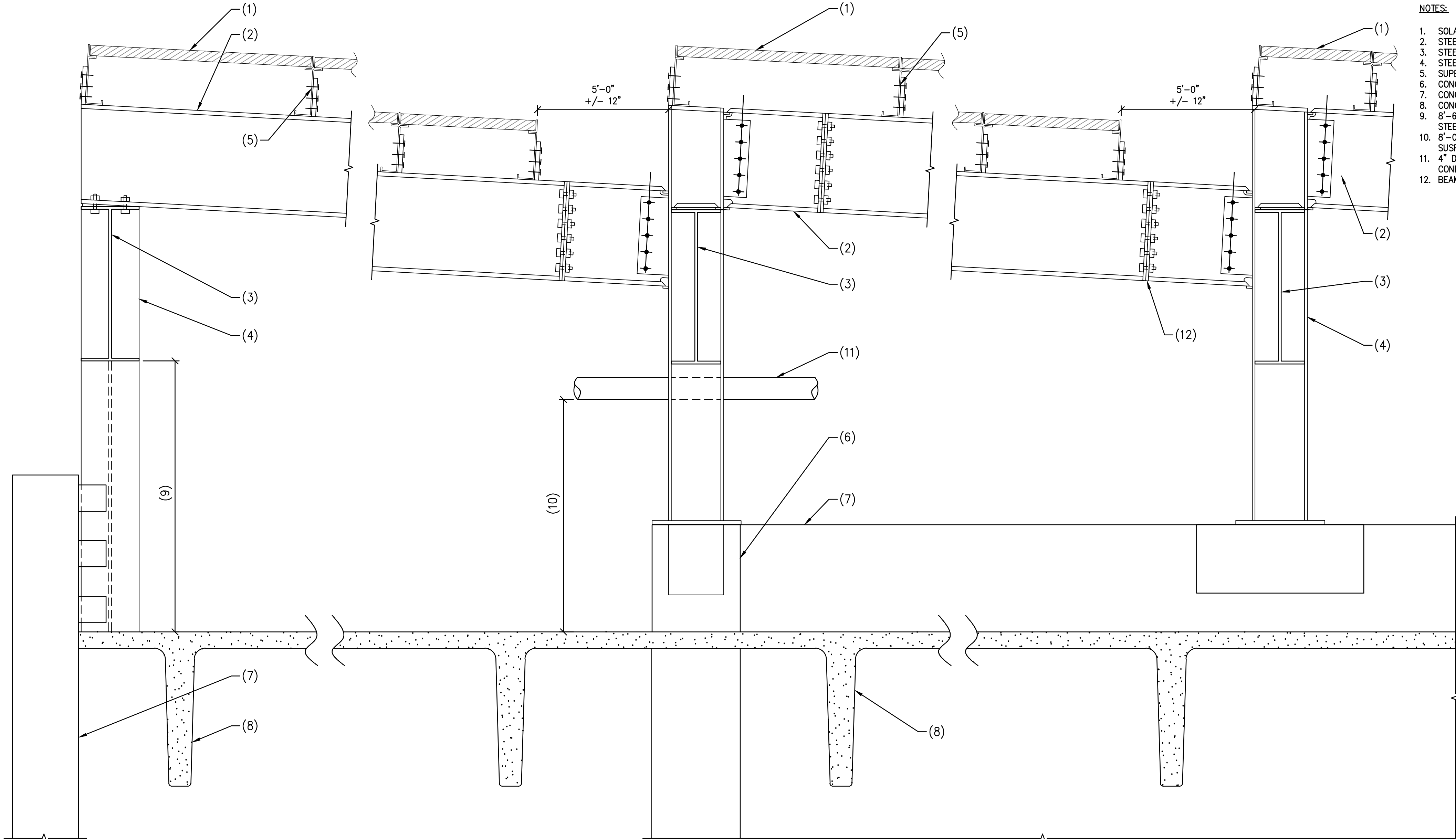
SPECIAL INSPECTION IS TO BE PROVIDED FOR THE ITEMS LISTED BELOW IN ADDITION TO THE INSPECTIONS CONDUCTED BY THE BUILDING JURISDICTION. "SPECIAL STRUCTURAL INSPECTION" SHALL NOT RELIEVE THE OWNER OR THEIR AGENT FROM REQUESTING THE BUILDING JURISDICTION INSPECTIONS REQUIRED BY SECTION 109 OF THE INTERNATIONAL BUILDING CODE. SPECIAL INSPECTION IS REQUIRED PER CHAPTER 17 FOR THE FOLLOWING:

STEEL CONSTRUCTION:

1. WELDING:
A. PERIODIC VISUAL INSPECTION OF ALL FIELD WELDS.
B. CONTINUOUS INSPECTION OF ALL MULTIPASS FILLET WELDS OR SINGLE PASS FILLET WELDS LARGER THAN 5/16".
C. NON-DESTRUCTIVE TESTING OF ALL COMPLETE PENETRATION WELDS BY AN AWS CERTIFIED INDEPENDENT TESTING LABORATORY AT THE CONTRACTORS EXPENSE.
D. VERIFICATION OF VALID WELDER'S CERTIFICATES.
E. ALL STRUCTURAL STEEL FABRICATORS SHALL EMPLOY AN AWS CERTIFIED INDEPENDENT TESTING LAB TO PROVIDE SHOP WELD INSPECTIONS PER CODE. INSPECTION REPORTS SHALL BE SUBMITTED TO ENGINEER OF RECORD PRIOR TO STEEL INSTALLATION.
2. STEEL FRAMES: VERIFICATION OF BRACING, STIFFENING, MEMBER LOCATIONS, AND PROPER JOINT DETAIL APPLICATION AT ALL STEEL FRAME CONNECTIONS.
3. HIGH STRENGTH BOLTING:
A. VERIFICATION OF SNUG TIGHT BOLT INSTALLATION FOR ASTM A325N (F3125) BOLTS.
B. VERIFICATION OF PROPER BOLT INSTALLATION AND PRE-TENSIONING FOR ASTM F3125N-A325 PT BOLTS.
C. VERIFICATION OF PRE-INSTALLATION TESTING AND PRE-TENSIONING CALIBRATION PROCEDURES FOR ASTM F3125N-A325 PT BOLTS.

DUTIES AND RESPONSIBILITIES OF THE SPECIAL INSPECTOR:

- A. THE SPECIAL INSPECTOR SHALL OBSERVE THE WORK ASSIGNED TO BE CERTAIN IT CONFORMS TO THE APPROVED DESIGN DRAWINGS AND SPECIFICATION.
- B. THE SPECIAL INSPECTOR IS NOT AUTHORIZED TO APPROVE DEVIATIONS FROM THE DESIGN DRAWINGS OR SPECIFICATIONS, AND ALL DEVIATIONS MUST BE APPROVED BY THE STRUCTURAL ENGINEER OF RECORD PRIOR TO PROCEEDING WITH THE WORK. ALL REQUESTS FOR DEVIATIONS SHALL BE INITIATED BY THE CONTRACTOR VIA WRITTEN REQUEST FOR INFORMATION (RFI).
- C. THE SPECIAL INSPECTOR SHALL FURNISH INSPECTION REPORTS TO THE BUILDING OFFICIAL, AND TO THE ENGINEER OR ARCHITECT OF RECORD. ALL DISCREPANCIES SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE CONTRACTOR FOR CORRECTION, THEN, IF UNCORRECTED, TO THE DESIGN AUTHORITY AND THE BUILDING OFFICIAL.
- D. THE CONTRACTOR SHALL PROVIDE THE SPECIAL INSPECTOR ACCESS TO ALL ITEMS REQUIRING SPECIAL INSPECTION. ACCESS SHALL BE PROVIDED BY IN-PLACE LADDERS, SCAFFOLDS, LIFTS AND/OR OTHER EQUIPMENT OPERATED BY THE CONTRACTOR'S PERSONNEL AS REQUIRED FOR SAFE OBSERVATION. INSPECTOR IS NOT RESPONSIBLE OR AUTHORIZED TO OPERATE CONTRACTOR'S EQUIPMENT.
- E. UPON COMPLETION OF THE ASSIGNED WORK THE ENGINEER OR ARCHITECT SHALL COMPLETE AND SIGN THE APPROPRIATE FORMS CERTIFYING THAT TO THE BEST OF THEIR KNOWLEDGE THE WORK IS IN CONFORMANCE WITH THE APPROVED PLANS AND SPECIFICATIONS, AND THE APPLICABLE WORKMANSHIP PROVISIONS OF THE CODE.



NOTES:

1. SOLAR PANEL.
2. STEEL BEAM.
3. STEEL GIRDER.
4. STEEL COLUMN.
5. SUPER PURLIN.
6. CONCRETE COLUMN.
7. CONCRETE WALL.
8. CONCRETE FEE.
9. 8'-0" CLEAR TO BOTTOM OF STEEL STRUCTURE.
10. 8'-0" CLEAR TO BOTTOM OF SUSPENDED CONDUIT.
11. 4" DIA. MAX. SUSPENDED CONDUIT AS OCCURS.
12. BEAM SPLICE PER DETAIL 121.



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SEAL:

**PRELIMINARY
NOT FOR
CONSTRUCTION
OR BIDDING**

BUC CAMPUS PARKING GARAGE SOLAR STRUCTURE
4456 DUNCAN AVENUE
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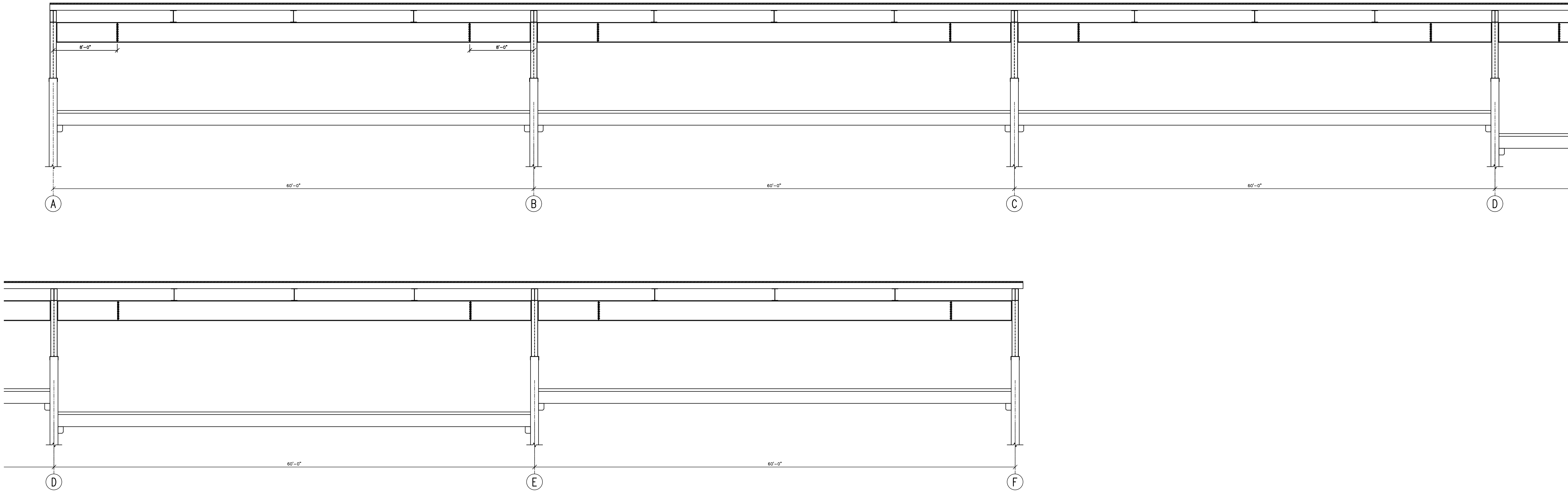
GENERAL STRUCTURAL NOTES AND BUILDING SECTION



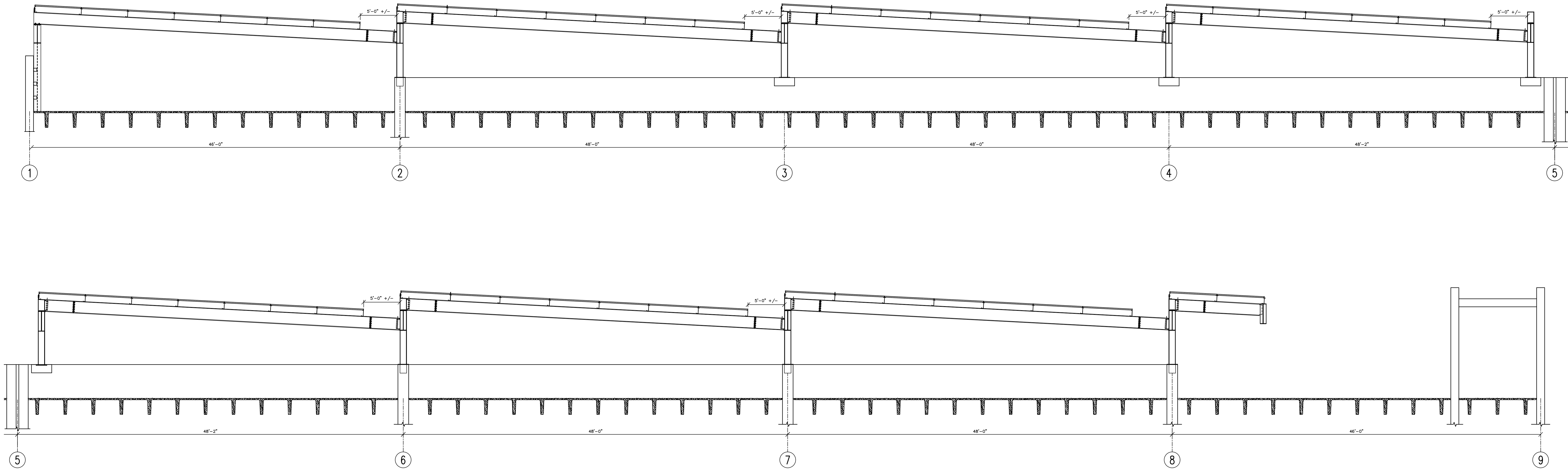
REVISIONS:

JOB NUMBER:	18-850
DRAWN:	JSB
ENGINEER:	DJB
CHECKED:	PGS
SCALE:	AS NOTED
DATE:	11-15-2018
SHEET:	S1.0

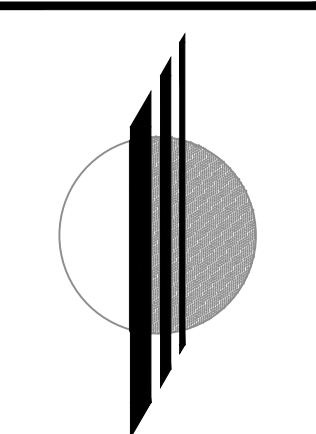
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1 FULL EAST-WEST BUILDING SECTION (FACING NORTH)
NOT TO SCALE



2 FULL NORTH-SOUTH BUILDING SECTION (FACING EAST)
NOT TO SCALE



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ST. LOUIS, MO 63110

BUILDING SECTION



REVISIONS:

JOB NUMBER:

18-850

DRAWN: JSB ENGINEER: DJB

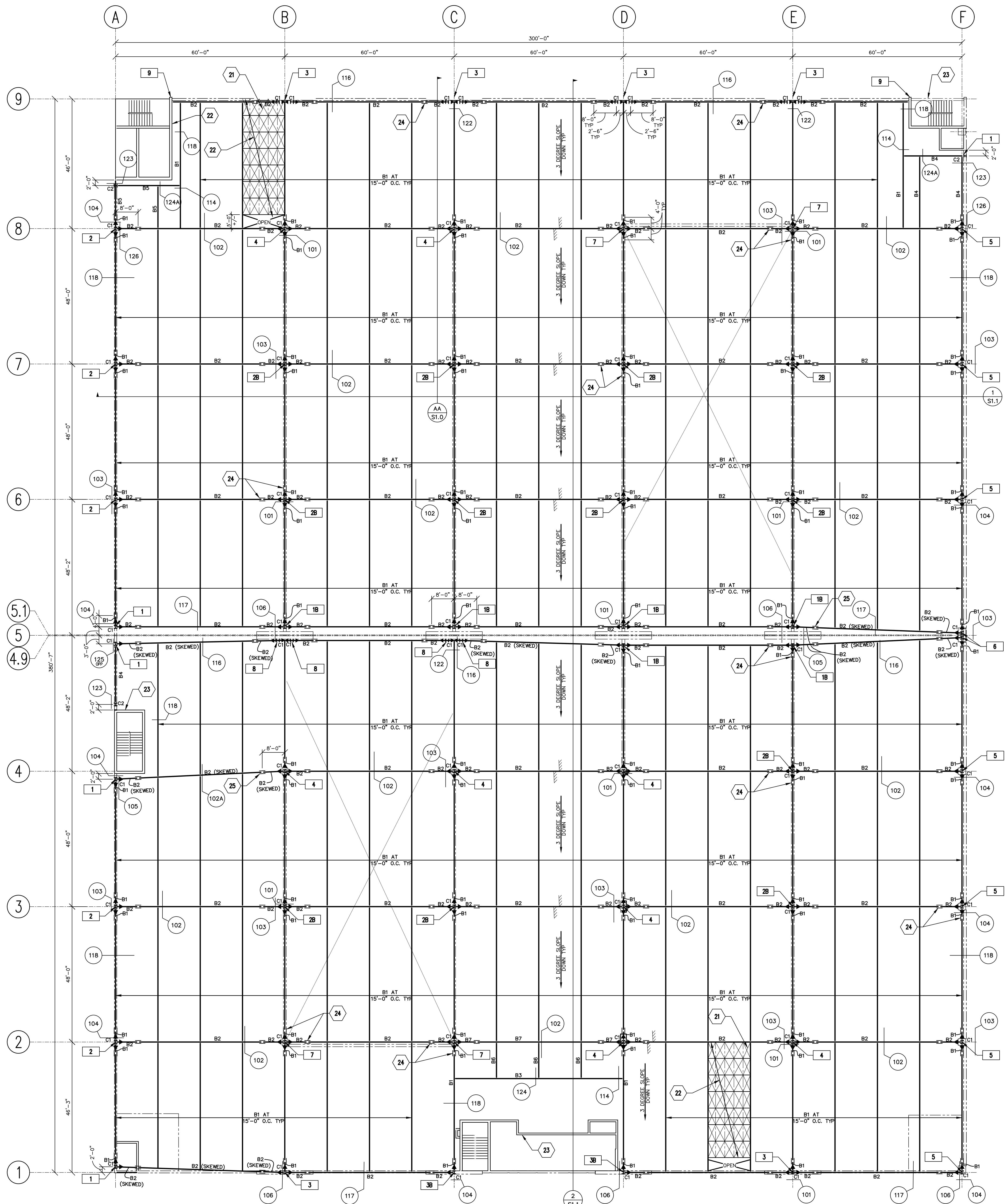
CHECKED: PGS SCALE: AS NOTED

DATE: 11-15-2018

SHEET:

S11

THESE DRAWINGS/CALCULATIONS ARE CONSIDERED PRELIMINARY - NOT FOR CONSTRUCTION OR RECORDING UNLESS THE STRUCTURAL ENGINEER OF RECORD'S SEAL IS AFFIXED WITH WRITTEN SIGNATURE.



SOLAR SUPPORT ROOF FRAMING PLAN
SCALE: 1/16"=1'-0"

ROOF FRAMING NOTES - TYP. U.N.O.

1. VERIFY ALL DIMENSIONS AND ELEVATIONS WITH THE ARCHITECTURAL DRAWINGS AND FIELD CONDITIONS. BUILDING DIMENSIONS AND ELEVATIONS, WHERE SHOWN, WERE PROVIDED BY THE ARCHITECT AND IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY AND COORDINATE ALL DIMENSIONS PRIOR TO PROCEEDING WITH THE WORK. ANY DISCREPANCIES SHALL BE RESOLVED THROUGH THE ARCHITECT.
2. SCHEDULED MARK DESIGNATIONS ARE TYPICAL TO THE PROJECT AND MAY NOT NECESSARILY BE FOUND ON THIS PLAN.
3. (X), (Y), ETC. - AS SHOWN ON PLAN INDICATES KEYNOTES, SEE ROOF FRAMING KEYNOTES ON THIS SHEET. KEYNOTE DESIGNATIONS ARE TYPICAL TO THE PROJECT AND MAY NOT NECESSARILY BE FOUND ON THIS PLAN.
4. (S) - AS SHOWN ON PLAN INDICATES STRUCTURAL BEARING AND/OR SHEAR WALL BELOW.
5. (C) - AS SHOWN ON PLAN INDICATES EXISTING (PRECAST) CONCRETE WALL, SEE G.S.N., TYPICAL DETAILS, PLANS, ELEVATIONS AND DETAILS FOR ADDITIONAL INFORMATION. VERIFY EXACT SIZE AND LOCATION OF OPENINGS WITH ARCHITECTURAL DRAWINGS.
6. B1, B2, ETC. - AS SHOWN ON PLAN INDICATES (STEEL) BEAM, SEE SCHEDULE THIS SHEET.
7. C1, C2, ETC. - AS SHOWN ON PLAN INDICATES (STEEL) COLUMN, SEE SCHEDULE ON FOUNDATION PLAN SHEET.
8. FOR CLARITY, DETAILS MAY SHOW ONLY ONE SIDE OF FRAMING CONDITIONS. ALL OPENINGS MAY NOT BE SHOWN ON THIS PLAN. FOR EXACT SIZE, NUMBER AND LOCATION OF OPENINGS, SEE ARCHITECTURAL, MECHANICAL, PLUMBING, ELECTRICAL, SPRINKLER AND THEIR RELATED DRAWINGS. FOR FRAMING AT OPENINGS, SEE TYPICAL DETAILS AND OTHER TRADES.
9. VERIFY EXACT SIZE, WEIGHT AND LOCATION OF EQUIPMENT AND SUPPORTS INDICATED ON PLAN WITH ARCHITECTURAL, MECHANICAL, PLUMBING, ELECTRICAL, SPRINKLER AND THEIR RELATED DRAWINGS. EQUIPMENT INDICATED ARE ONLY THOSE THAT EXCEED LOADS SPECIFIED IN THE G.S.N. FOR SUPPORT OF EQUIPMENT, SEE TYPICAL DETAILS AND OTHER TRADES.
10. THE EXISTING CONDITIONS DEPICTED ON THESE DRAWINGS ARE BASED ON THE BEST AVAILABLE INFORMATION AND SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE STRUCTURAL ENGINEER IMMEDIATELY.
11. (M) - AS SHOWN INDICATES MOMENT WELD.
12. (B), (C), ETC. - AS SHOWN INDICATES BASE CONNECTION DETAIL TYPE PER STL ENGINEERING, DRAWING NUMBER 1628.

STEEL BEAM (B) SCHEDULE

919-02

- NOTE:
1. FOR SIZE AND QUANTITY OF BOLTS, SEE TYPICAL BOLT DETAIL - U.N.O.
 2. INDICATES POSITIVE BEAM CAMBER WHERE "N/A" (NOT APPLICABLE) IS SHOWN, PROVIDE AS ROLLED CAMBER. INSTALL CROWN UP PER AISC.
 3. FOR ADDITIONAL INFORMATION, SEE G.S.N., PLAN(S) AND DETAILS.

MARK	SIZE	CAMBER (SEE NOTE 2)	REMARKS
B1	W18x46	.	----
B2	W30x116	C=3/4"	----
B3	W21x55	C=3/4"	----
B4	W14x22	.	----
B5	W12x16	.	----
B6	W18x35	.	----
B7	W30x99	C=3/4"	----

COLUMN (C) SCHEDULE

910-01

MARK	SIZE	BASE CONNECTION	BOLT PATTERN AND/OR REMARKS
C1	W10x60	SEE STL ENGINEERING DRAWING NUMBER 1628	----
C2	W10x31	SEE STL ENGINEERING DRAWING NUMBER 1628	----

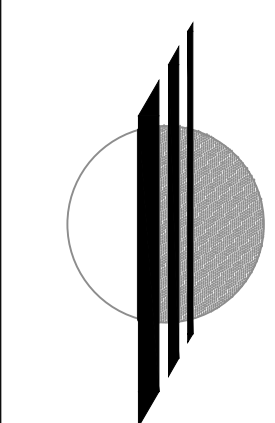
FRAMING KEYNOTES

940-11

- (21) SOLAR PANEL BY OTHERS - VERIFY LAYOUT W/ PROVIDER.
- (22) SUPER PURLIN PER DETAIL 107. LOCATE AT EACH END OF SOLAR PANEL TYP.
- (23) EXISTING PRECAST CONCRETE OR MASONRY WALL.
- (24) BEAM SPLICES PER DETAIL 121, TYP. AT MOMENT FRAME BEAMS.
- (25) SKEW BEAM SPLICE CONNECTION AS REQ'D.

NOTE:
SOLAR PANEL AND SUPER PURLIN LAYOUT NOT SHOWN FOR CLARITY. SUPER PURLIN SHALL OCCUR AT EACH END OF SOLAR PANEL TYP. EXACT SOLAR PANEL CONFIGURATION SHALL BE PROVIDED BY SOLAR PANEL PROVIDER. ALL STRUCTURAL SUPPORT HAS BEEN DESIGNED ASSUMING 100% FULL COVERAGE.

NOTE:
ATTACHMENTS TO AND ADEQUACY OF THIS EXISTING CONCRETE STRUCTURE IS OUTSIDE OF THE SCOPE OF THESE DRAWINGS. PLEASE SEE STRUCTURAL DRAWINGS PREPARED BY STL ENGINEERING FOR ADDITIONAL INFORMATION. DETAIL CUTS REFERRING TO THOSE DRAWINGS HAVE BEEN ADDED FOR CLARITY. (DETAILS 1) THRU (9)



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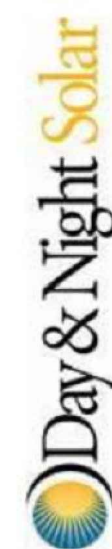
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BUC CAMPUS PARKING GARAGE SOLAR STRUCTURE

4456 DUNCAN AVENUE
ST. LOUIS, MO 63110

PLAN N



REVISIONS:

JOB NUMBER:

18-850

DRAWN: JSB ENGINEER: DJB

CHECKED: PGS SCALE: AS NOTED

DATE: 11-15-2018

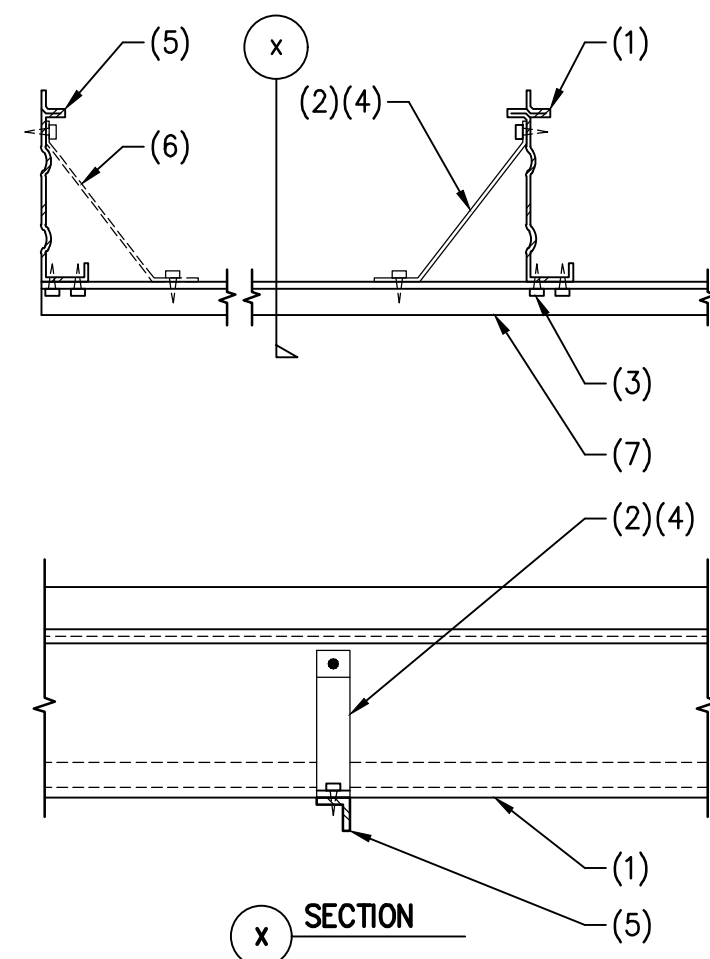
SHEET: S2.0

THESE DRAWINGS/CALCULATIONS ARE CONSIDERED PRELIMINARY - NOT FOR CONSTRUCTION OR RECORDING UNLESS THE STRUCTURAL ENGINEER OF RECORD'S SEAL IS AFFIXED WITH WRITTEN SIGNATURE.

NOMINAL BEAM DEPTH "D"	NUMBER OF 3/4" DIA ASTM F3125 GRADE A325 BOLTS
UP TO 7"	2
8" - 11"	2
12" - 14"	3
15" - 17"	4
18" - 20"	5
21" - 23"	6
24" - 29"	7
30" - 32"	8
33" - 35"	9
36"	10

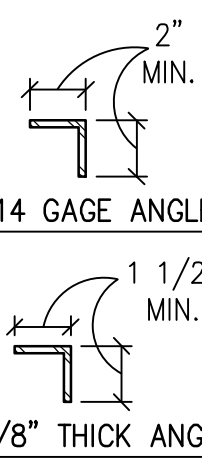
FRAMING NOTES:

1. THE TYPICAL STEEL BEAM TO STEEL COLUMN OR STEEL BEAM TO STEEL BEAM CONNECTION CONSISTS OF 3/8" SINGLE SHEAR PLATES WITH BOLTS PER SCHEDULE. USE 5/8" SHEAR PLATES WHERE "D" = 27" OR GREATER OR WHERE SHEAR PLATE IS MORE THAN 6" WIDE. ALL BOLTS SHALL BE INSTALLED THROUGH "SHORT" SLOTTED HOLES IN EITHER THE BEAM WEB OR SHEAR PLATE. INSTALL WASHERS AND TIGHTEN "SNUG TIGHT" U.N.O.

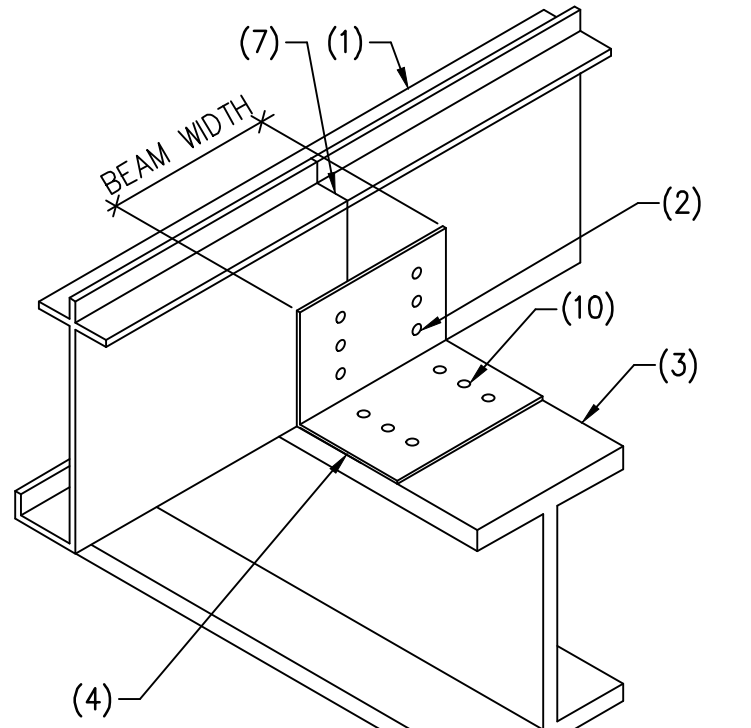


NOTES:

1. INTERIOR PURLIN.
2. WIDE x1/4" LONG STRAP ATTACH WITH 1 #12x3/4" LONG SCREW AT EACH END OF STRAP AS SHOWN.
3. 2 #12x3/4" LONG SCREWS AT EACH PURLIN.
4. STRAP TO OCCUR AT INTERIOR PURLIN.
5. EXTERIOR PURLIN.
6. AT CONTRACTOR'S OPTION STRAP TO OCCUR AT EXTERIOR PURLIN INSTEAD OF INTERIOR PURLIN.
7. BRACE OPTIONS:



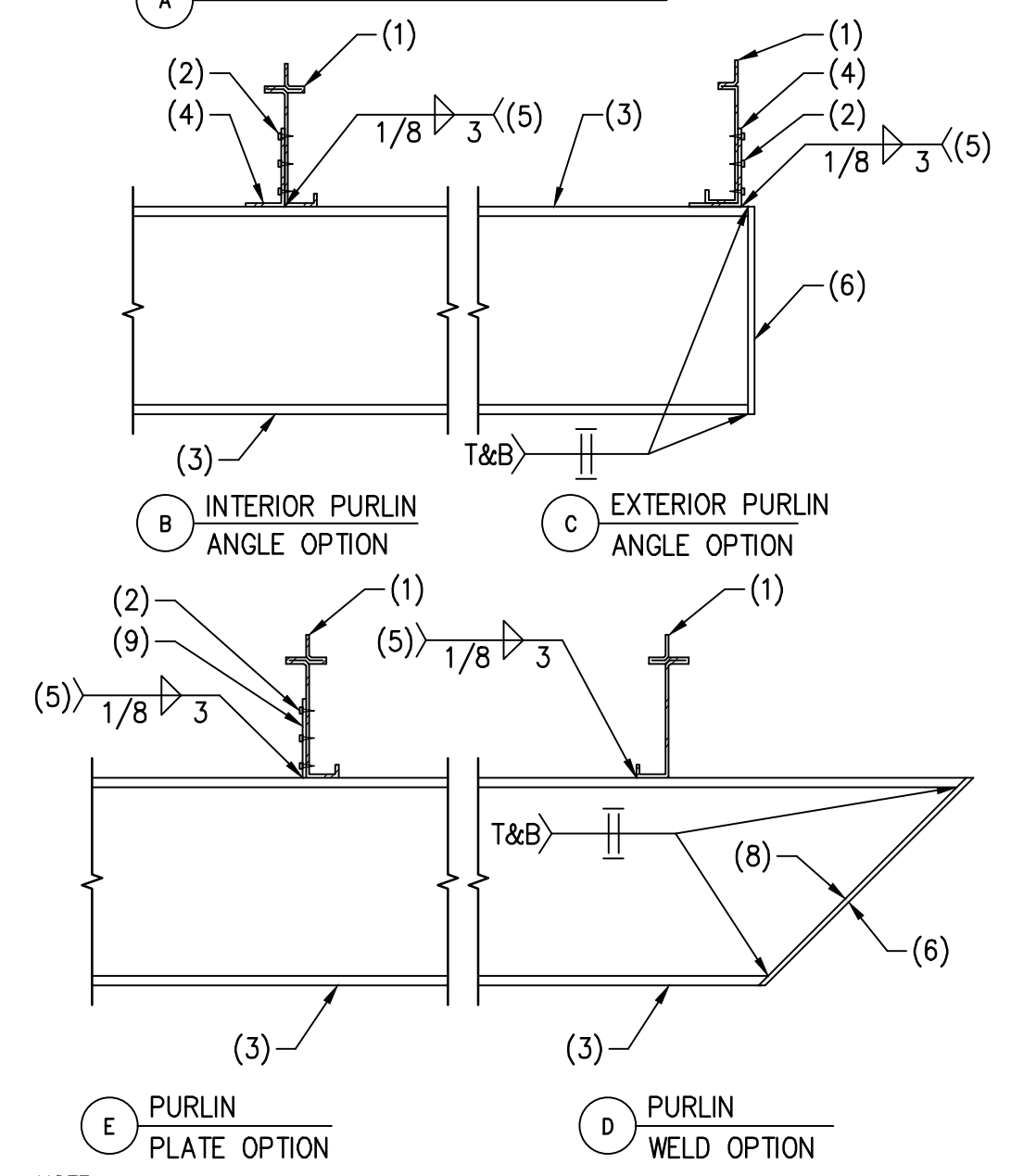
NOTE: SUPER PURLIN BRACING SHALL OCCUR AT MIDSPAN OR 8'-0" O.C. TYP. U.N.O.



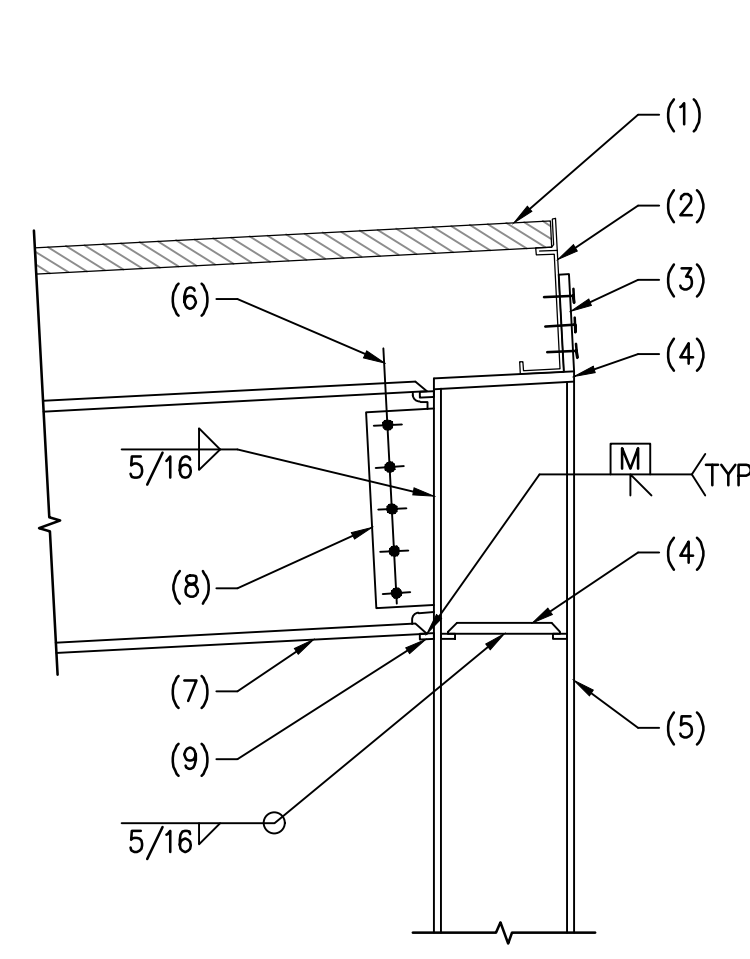
NOTES:

1. PURLIN.
2. 6 #12x3/4" LONG SCREWS TO PURLIN - TYP.
3. STEEL BEAM.
4. 4"x4"x10 GAGE STEEL CLIP ANGLE (LVL) x6 LONG.
5. WELD TO STEEL BEAM.
6. AT CONTRACTOR'S OPTION: 1/4" NON-STRUCTURAL END PLATE.
7. OPTIONAL SPLICE LOCATION AT INTERIOR FRAMES PER PLAN.
8. AT CONTRACTOR'S OPTION: CUT BEAM ENDS AT 45 DEGREES ± 15 DEGREES.
9. AT CONTRACTOR'S OPTION: 6"x4"x12 GAGE STEEL PLATE Fy=55 KSI MIN.
10. AS AN ALTERNATIVE TO WELDING THE CLIP TO THE BEAM, USE 6 #12 SCREWS OR HILL X-U x 1" LONG SHOT PINS.

PURLIN CLIP AT SPLICE LOCATIONS

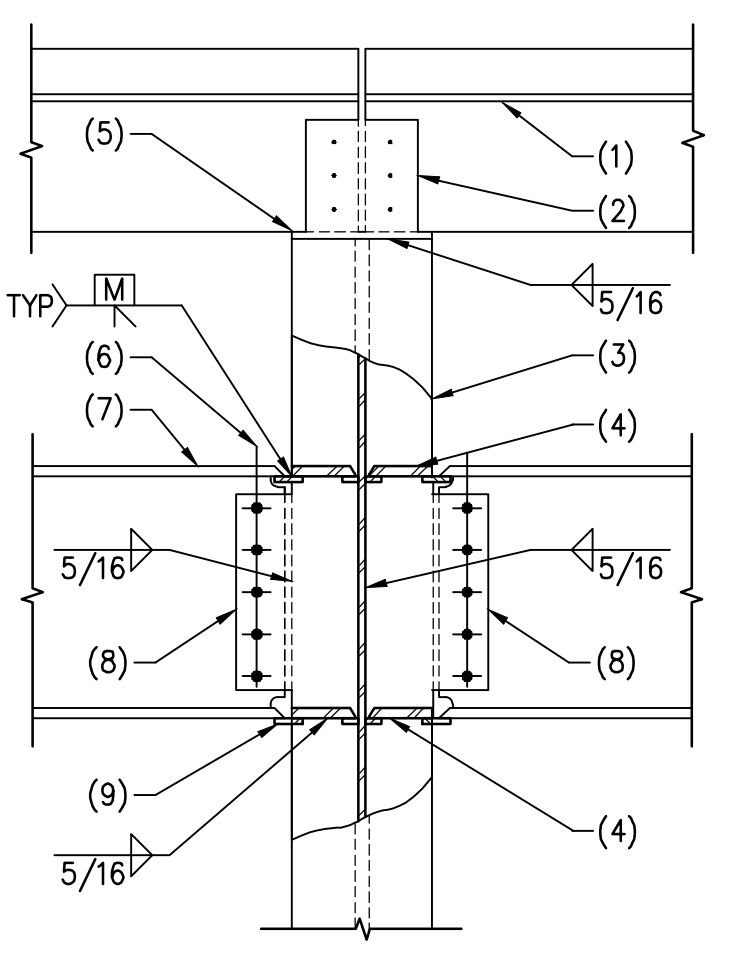


NOTE: ANY OF THESE CONNECTIONS SHOWN MAY BE USED AT CONTRACTOR'S OPTION.



NOTES:

1. SOLAR PANEL.
2. SUPER PURLIN.
3. CONNECTION PER TYP. DETAIL.
4. STEEL PLATE TO MATCH BEAM FLANGE THICKNESS (1/2" MIN).
5. STEEL COLUMN.
6. SIZE TYPE AND NUMBER OF BOLTS PER TYPICAL DETAIL.
7. STEEL BEAM.
8. SHEAR PLATE CONNECTOR PLATE PER TYP. DETAIL.
9. STEEL BACKER PLATE.



NOTES:

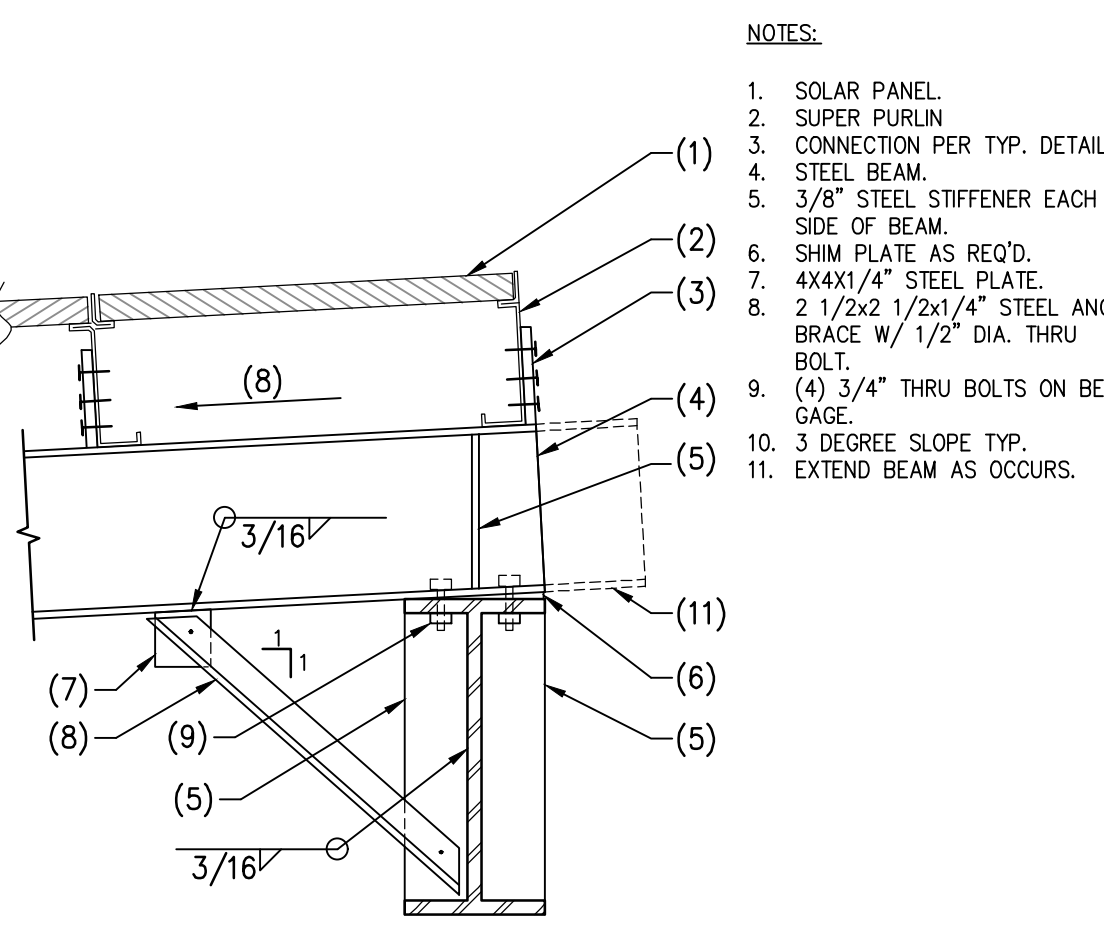
1. SUPER PURLIN.
2. CONNECTION PER TYP. DETAIL.
3. STEEL COLUMN.
4. STEEL PLATE TO MATCH BEAM FLANGE THICKNESS (1/2" MIN).
5. TOP AND BOTTOM - EACH SIDE OF WEB.
6. 1/2" STEEL CAP PLATE.
7. SIZE, TYPE AND NUMBER OF BOLTS. SEE TYPICAL DETAIL.
8. STEEL BEAM.
9. SHEAR PLATE PER TYP. DETAIL.
10. STEEL BACKER PLATE.

115 BOLT SCHEDULE FOR TYPICAL STEEL CONNECTIONS 401-14 NO SCALE

111 BRACING AT PURLINS 18-850 NO SCALE

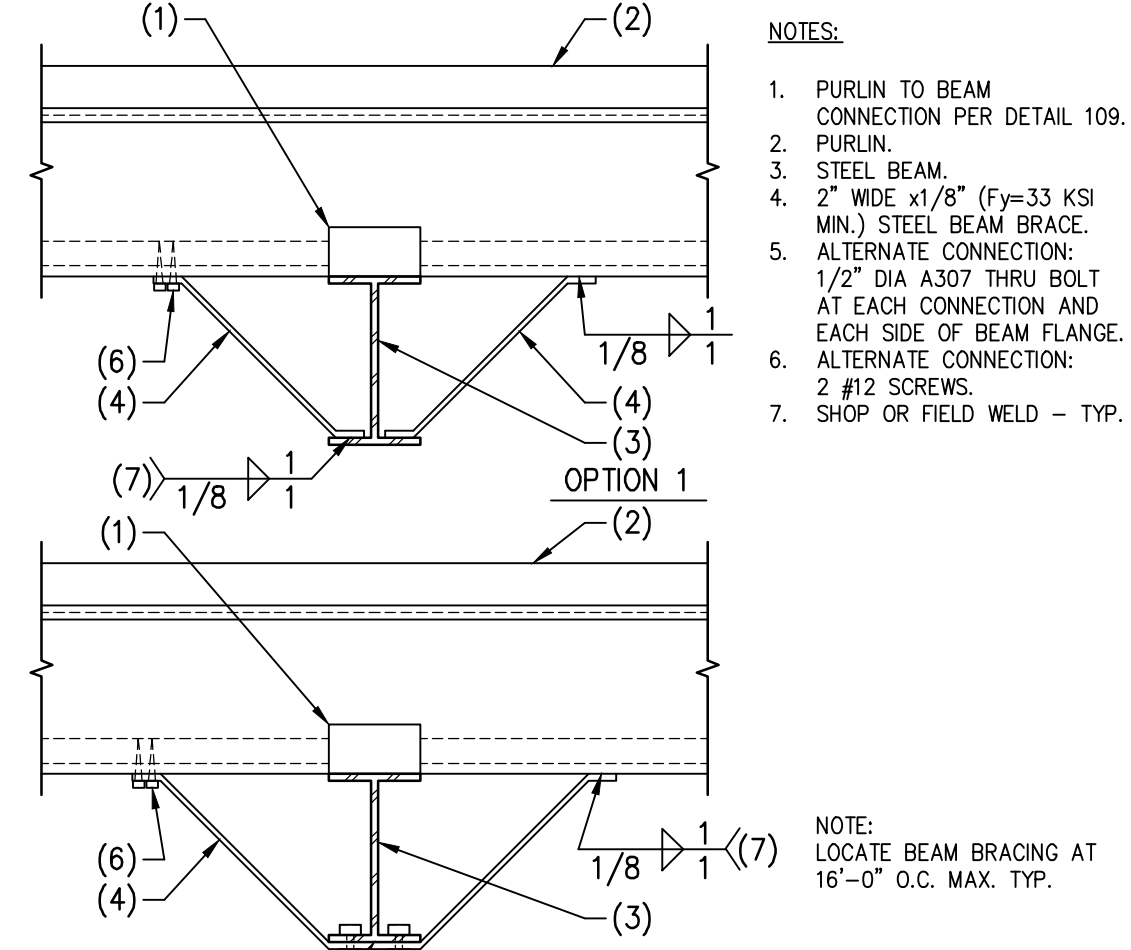
105 STEEL BEAM AT STEEL COLUMN - MOMENT CONNECTIONS 18-850 NO SCALE

101 STEEL BEAM AT STEEL COLUMN - MOMENT CONNECTION 18-850 NO SCALE



NOTES:

1. SOLAR PANEL.
2. SUPER PURLIN.
3. CONNECTION PER TYP. DETAIL.
4. STEEL BEAM.
5. 3/8" STEEL STIFFENER EACH SIDE OF BEAM.
6. SHM PLATE AS REQD.
7. 4"x4"x14" STEEL PLATE.
8. 2 1/2x2 1/2x1/4" STEEL ANGLE BRACE W/ 1/2" DIA. THRU BOLT.
9. (4) 3/4" THRU BOLTS ON BEAM GAGE.
10. 3 DEGREE SLOPE TYP.
11. EXTEND BEAM AS OCCURS.



NOTES:

1. PURLIN TO BEAM CONNECTION PER DETAIL 109.
2. PURLIN.
3. STEEL BEAM.
4. WIDE x1/8" (Fy=33 KSI MIN.) STEEL BEAM BRACE.
5. ALTERNATE CONNECTION: 1/2" DIA A307 THRU BOLT AT EACH CONNECTION AND EACH SIDE OF BEAM FLANGE.
6. ALTERNATE CONNECTION: 2 #12 SCREWS.
7. SHOP OR FIELD WELD - TYP.

NOTE: BEAM BRACING AT 16'-0" O.C. MAX. TYP.

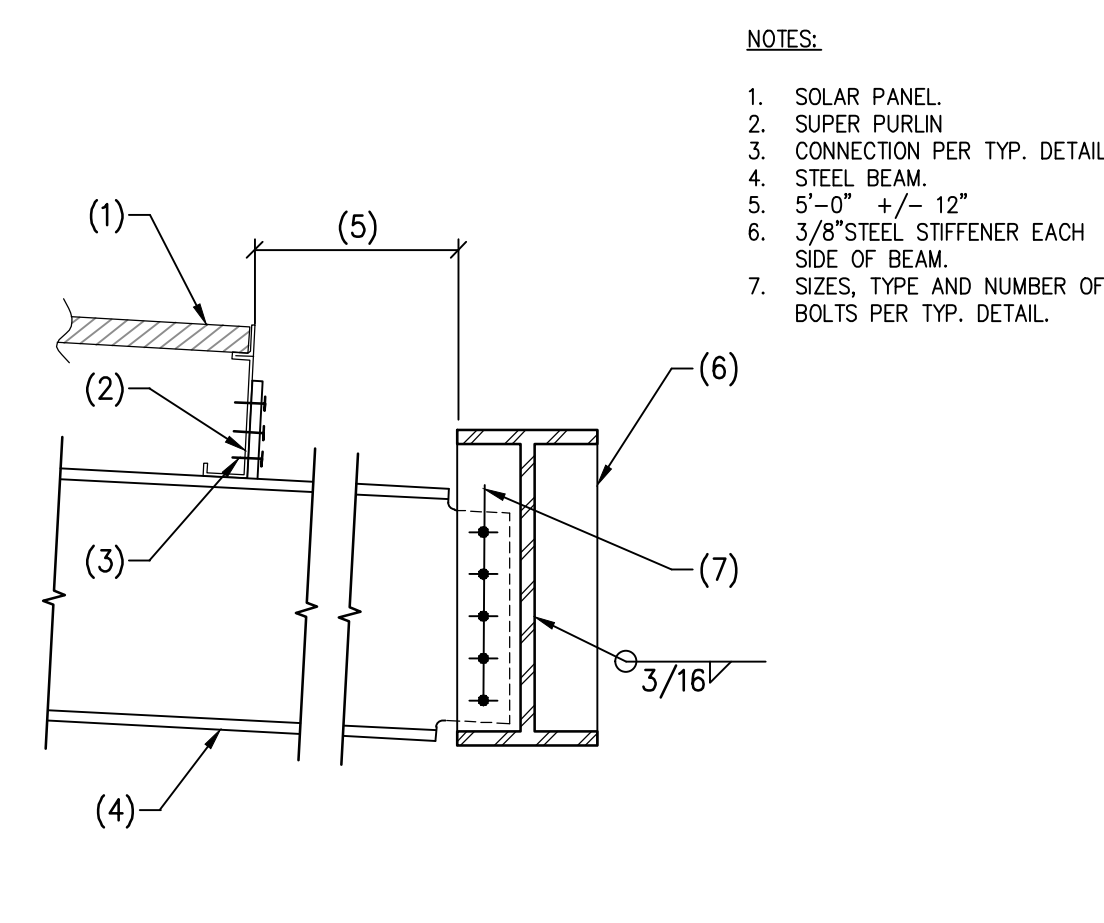
116 STEEL BEAM AT STEEL BEAM 18-850 NO SCALE

112 STEEL BEAM BRACE 18-850 NO SCALE

109 PURLIN TO BEAM CONNECTION 18-850 NO SCALE

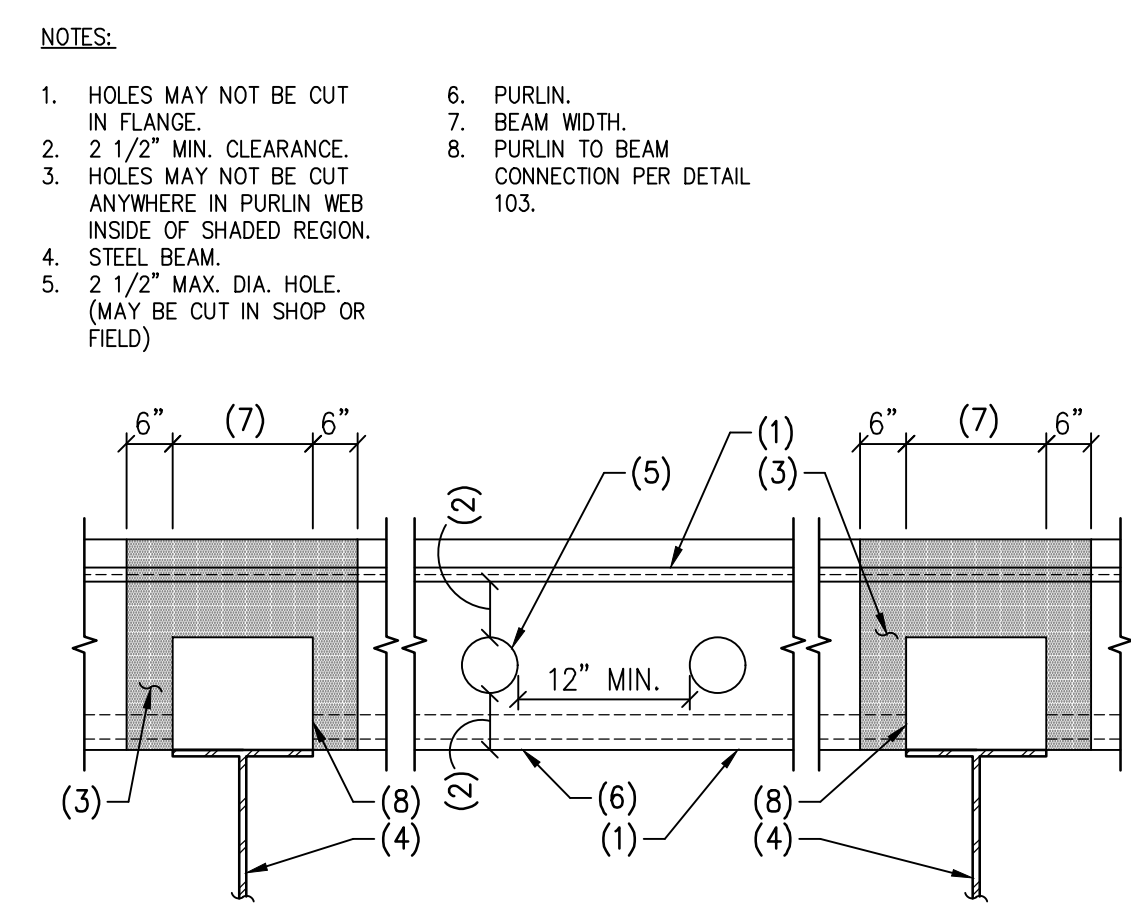
106 STEEL BEAM AT STEEL COLUMN - MOMENT CONNECTIONS 18-850 NO SCALE

102 STEEL BEAM AT STEEL BEAM 18-850 NO SCALE



NOTES:

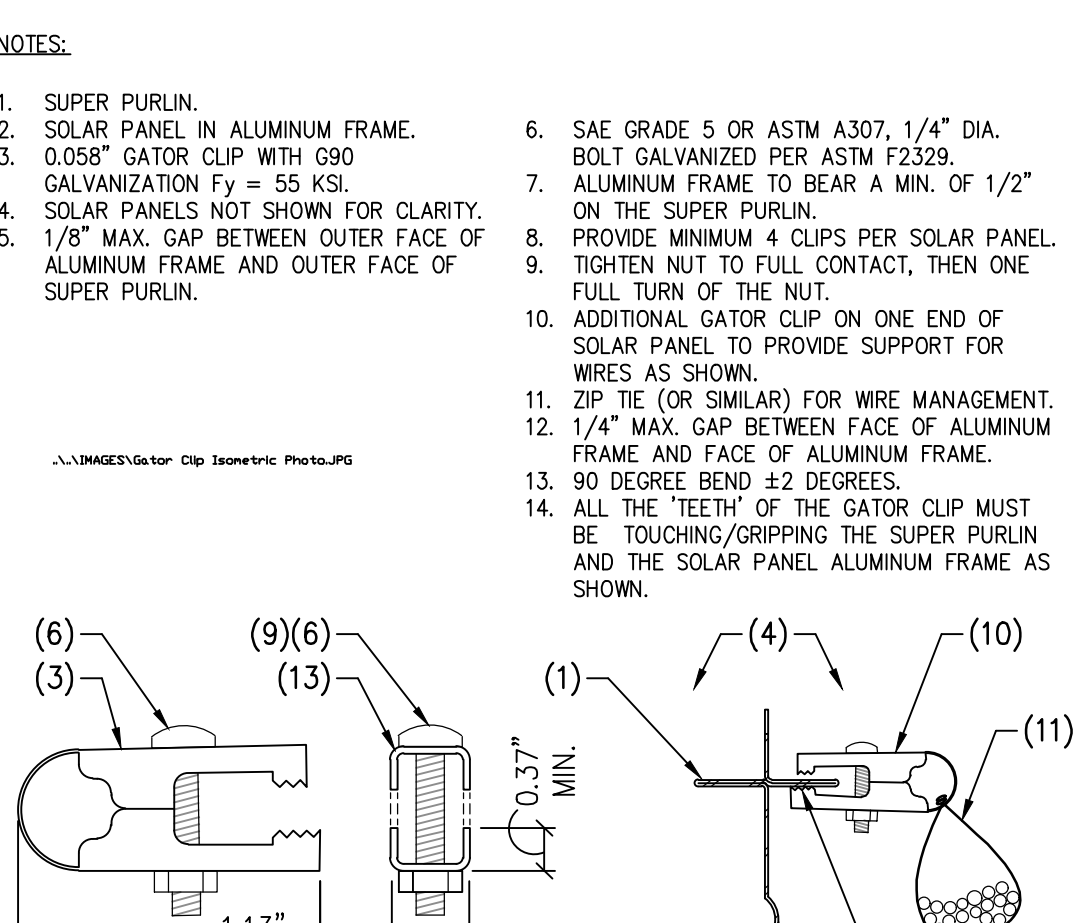
1. SOLAR PANEL.
2. SUPER PURLIN.
3. CONNECTION PER TYP. DETAIL.
4. STEEL BEAM.
5. 5'-0" ± 1/2" STEEL STIFFENER EACH SIDE OF BEAM.
6. SIZE, TYPE AND NUMBER OF BOLTS PER TYP. DETAIL.



NOTES:

1. HOLES MAY NOT BE CUT IN FLANGE.
2. 2 1/2" MIN. CLEARANCE.
3. HOLES MAY NOT BE CUT ANYWHERE IN PURLIN WEB INSIDE OF SHADDED REGION.
4. STEEL BEAM.
5. 2 1/2" MAX. DIA. HOLE (MAY BE CUT IN SHOP OR FIELD).
6. PURLIN.
7. BEAM WIDTH.

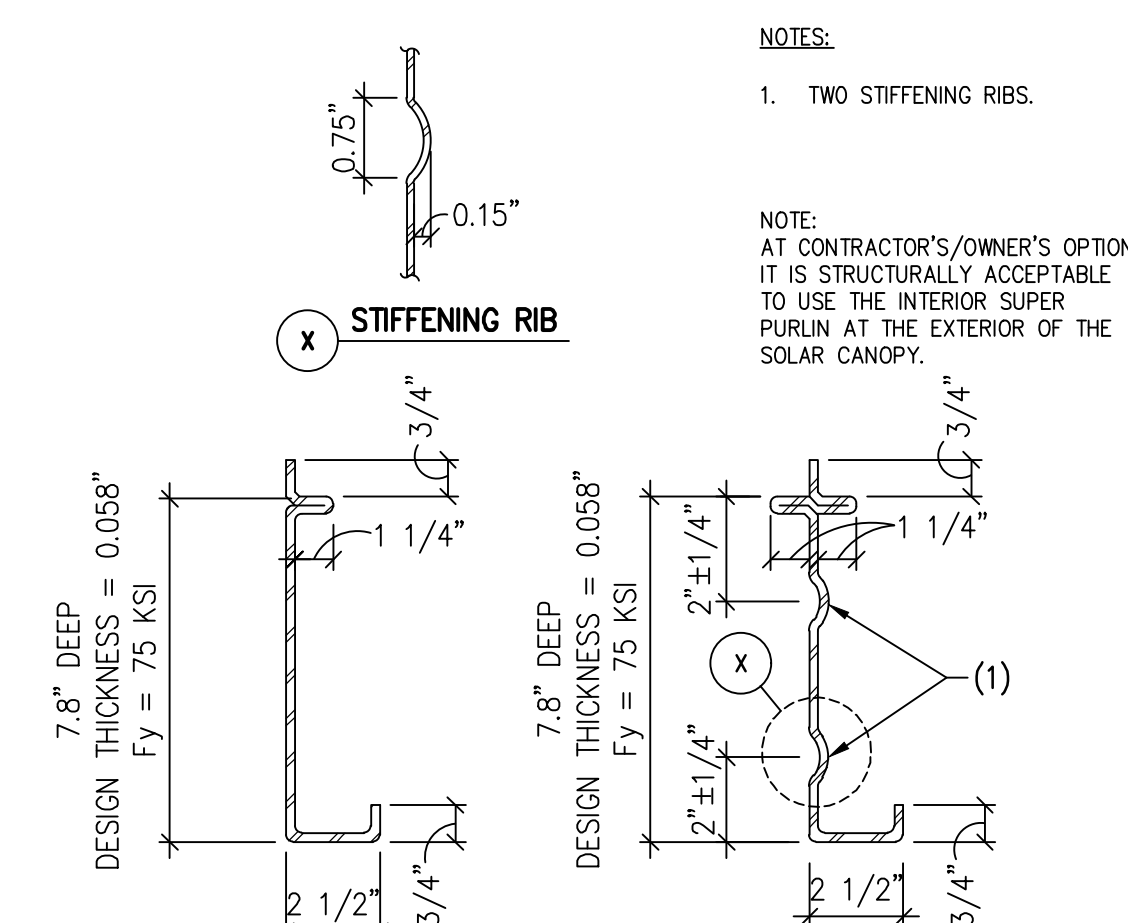
8. PURLIN TO BEAM CONNECTION PER DETAIL 103.



NOTES:

1. SUPER PURLIN.
2. SOLAR PANEL IN ALUMINUM FRAME.
3. 0.058" GATOR CLIP WITH G80 GALVANIZATION Fy = 55 KSI.
4. SOLAR PANELS NOT SHOWN FOR CLARITY.
5. 1/8" MAX. GAP BETWEEN OUTER FACE OF ALUMINUM FRAME AND OUTER FACE OF SUPER PURLIN.
6. SAE GRADE 5 OR ASTM A307, 1/4" DIA. BOLT GALVANIZED PER ASTM F2328.
7. ALUMINUM FRAME TO BEAR A MIN. OF 1/2" ON THE SUPER PURLIN.
8. PROVIDE MINIMUM 4 CLIPS PER SOLAR PANEL.
9. TIGHTEN NUT TO FULL CONTACT, THEN ONE FULL TURN OF THE NUT.
10. ADDITIONAL GATOR CLIP ON ONE END OF SOLAR PANEL TO PROVIDE SUPPORT FOR WIRES AS SHOWN.
11. ZIP TIE (OR SIMILAR) FOR WIRE MANAGEMENT.
12. 1/4" MAX. GAP BETWEEN FACE OF ALUMINUM FRAME AND FACE OF ALUMINUM FRAME.
13. 90 DEGREE BEND ± 2 DEGREES.
14. ALL THE "TEETH" OF THE GATOR CLIP MUST BE TOUCHING/GRIPPING THE SUPER PURLIN AND THE SOLAR PANEL ALUMINUM FRAME AS SHOWN.

NOTE: VERIFY EXACT SOLAR PANEL DIMENSIONS WITH MANUFACTURER - TYP.



NOTES:

1. TWO STIFFENING RIBS.

NOTE: AT CONTRACTOR'S/OWNER'S OPTION: IT IS STRUCTURALLY ACCEPTABLE TO USE THE INTERIOR SUPER PURLIN AT THE EXTERIOR OF THE SOLAR CANOPY.

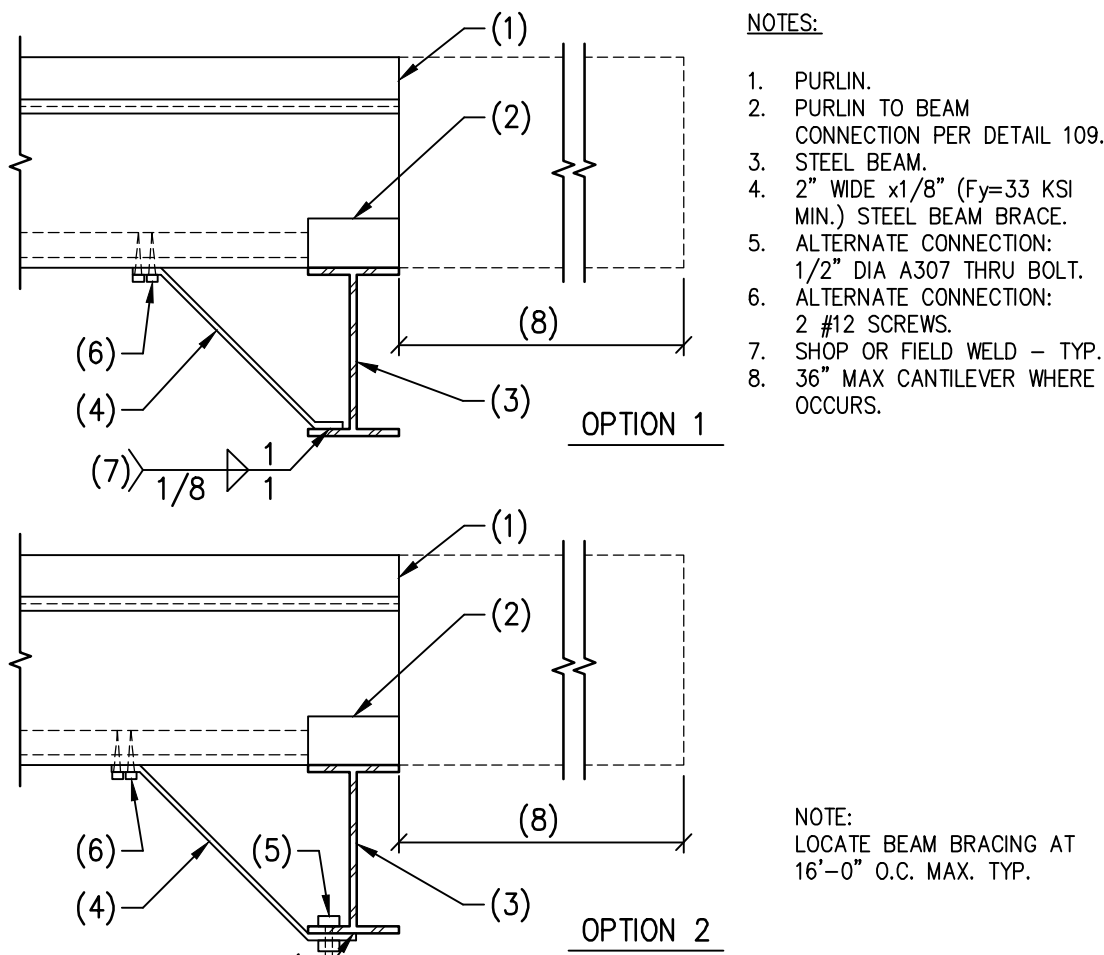
117 STEEL BEAM AT STEEL BEAM 18-850 NO SCALE

113 ALLOWABLE HOLES IN PURLIN 18-850 NO SCALE

110 SOLAR PANEL ATTACHMENT TO POWERS STEEL SUPER PURLINS USING THE POWERS STEEL GATOR CLIP 18-850 NO SCALE

107 POWERS STEEL 'SUPER' PURLIN 18-850 NO SCALE

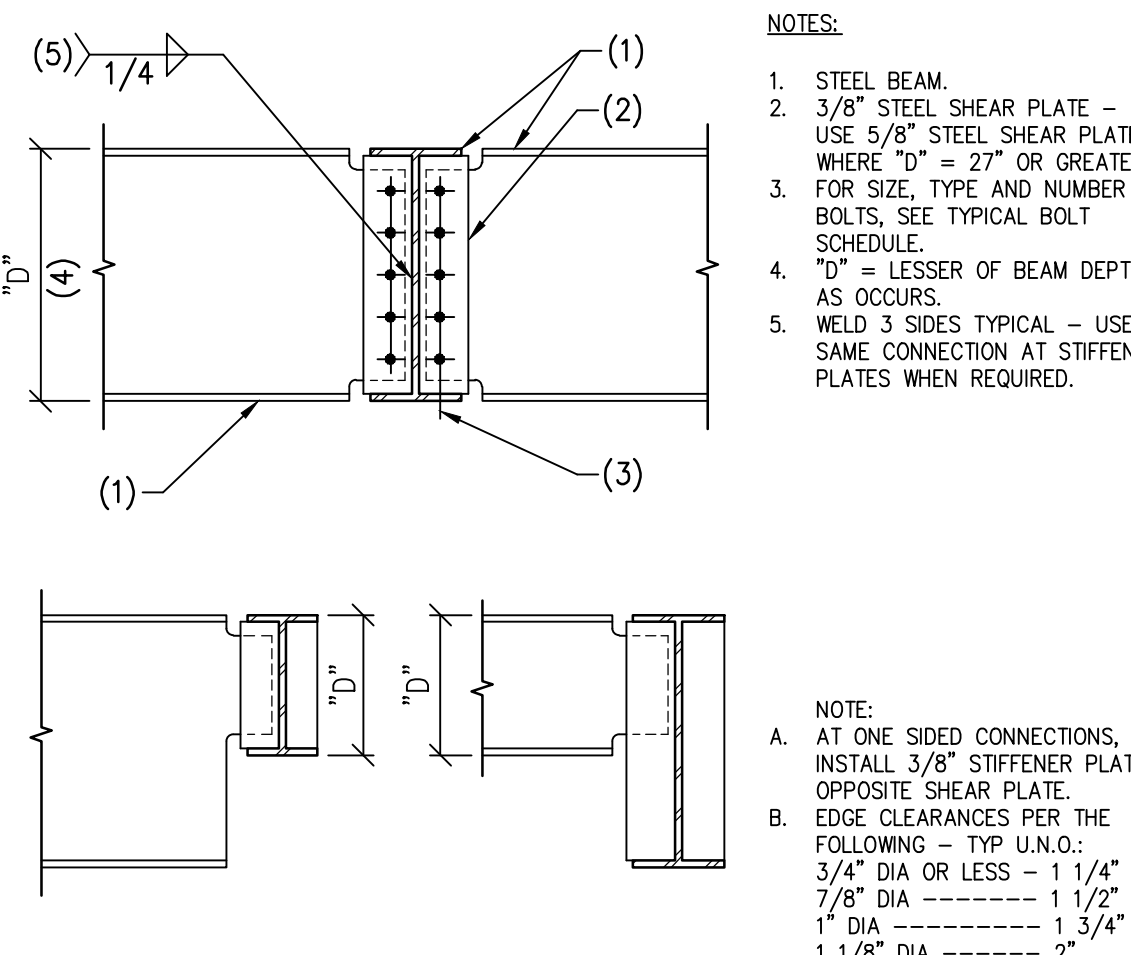
103 STEEL BEAM AT STEEL COLUMN - MOMENT CONNECTIONS 18-850 NO SCALE



NOTES:

1. PURLIN.
2. PURLIN TO BEAM CONNECTION PER DETAIL 109.
3. STEEL BEAM.
4. 2" WIDE x1/8" (Fy=33 KSI MIN.) STEEL BEAM BRACE.
5. ALTERNATE CONNECTION: 1/2" DIA A307 THRU BOLT.
6. ALTERNATE CONNECTION: 2 #12 SCREWS.
7. SHOP OR FIELD WELD - TYP.
8. 36" MAX CANTILEVER WHERE OCCURS.

NOTE: LOCATE BEAM BRACING AT 16'-0" O.C. MAX. TYP.



NOTES:

1. STEEL BEAM.
2. 3/8" STEEL SHEAR PLATE - USE 5/8" STEEL SHEAR PLATE WHERE "D" = 27" OR GREATER.
3. FOR SIZE, TYPE AND NUMBER OF BOLTS, SEE TYPICAL BOLT SCHEDULE.
4. "D" = LESSER OF BEAM DEPTHS.
5. WELD 3 SIDES TYPICAL - USE SAME CONNECTION AT STIFFENER PLATES WHEN REQUIRED.

NOTE: AT ONE SIDED CONNECTIONS, INSTALL 3/8" STIFFENER PLATE OPPOSITE SHEAR PLATE. EDGE CLEARANCES PER THE FOLLOWING - TYP U.N.O.: 3/4" DIA OR LESS - 1 1/4" 7/8" DIA - 1 1/2" 1" DIA - 1 3/4" 1 1/8" DIA - 2 1 1/4" DIA - 2 1/4" OVER 1 1/4" DIA - 1.75xDIA

118 STEEL BEAM BRACE AT END BAY 18-850 NO SCALE

114 TYPICAL CONNECTION WIDE FLANGE BEAM TO BEAM 413-01 NO SCALE

110 SOLAR PANEL ATTACHMENT TO POWERS STEEL SUPER PURLINS USING THE POWERS STEEL GATOR CLIP 18-850 NO SCALE

108 END CAP AT PURLIN 18-850 NO SCALE

104 STEEL BEAM AT STEEL COLUMN - MOMENT CONNECTION 18-850 NO SCALE

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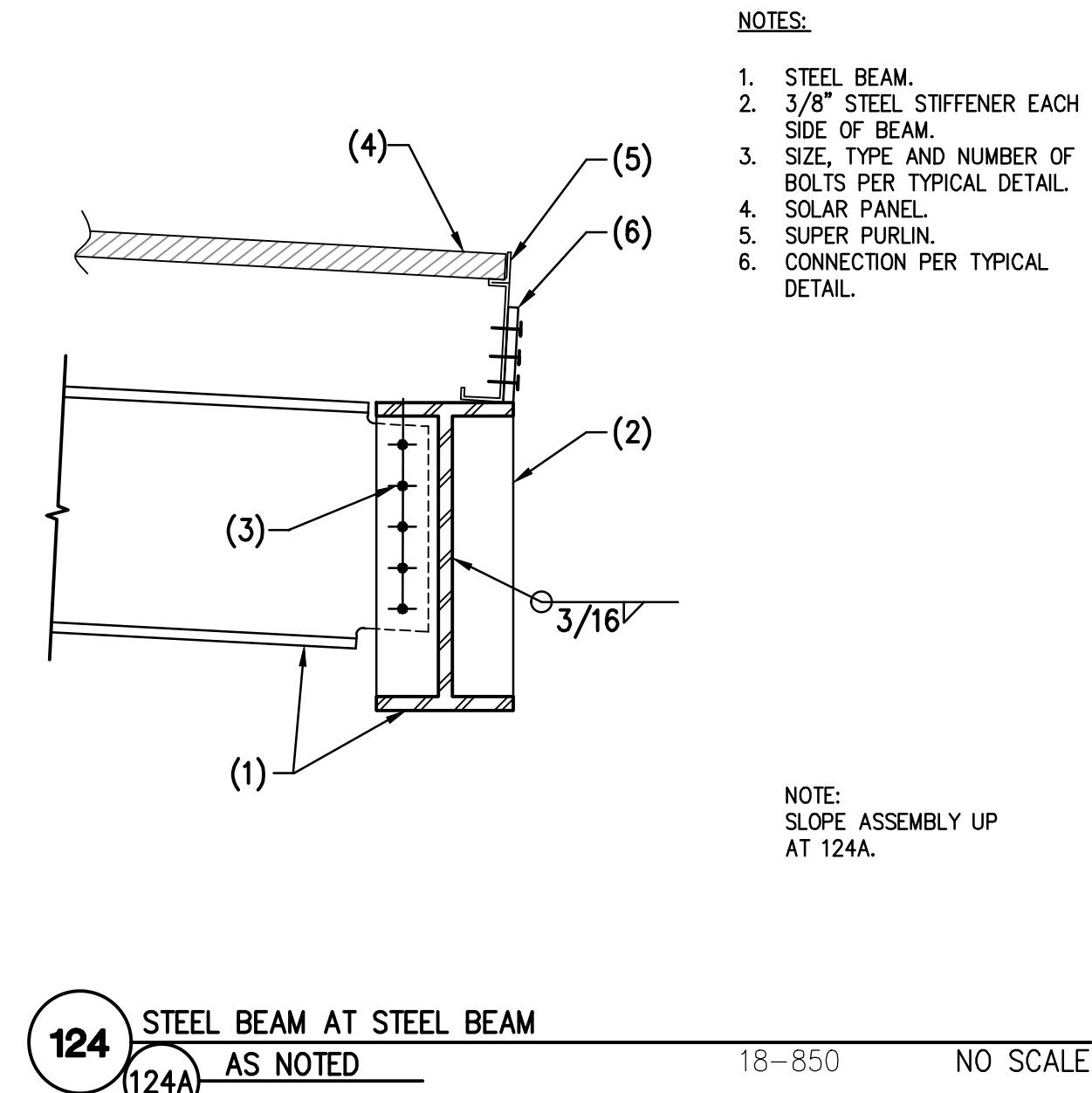
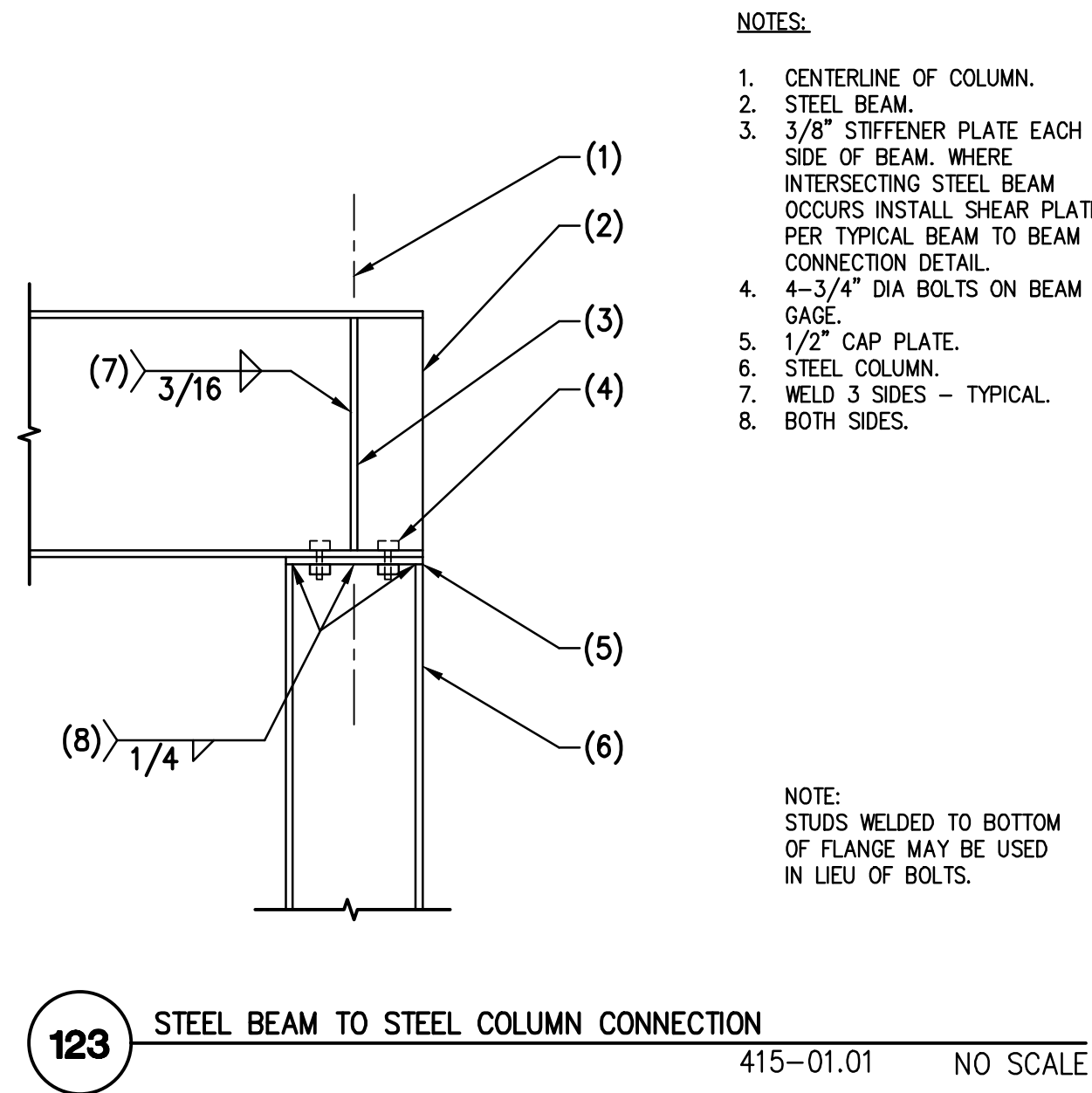
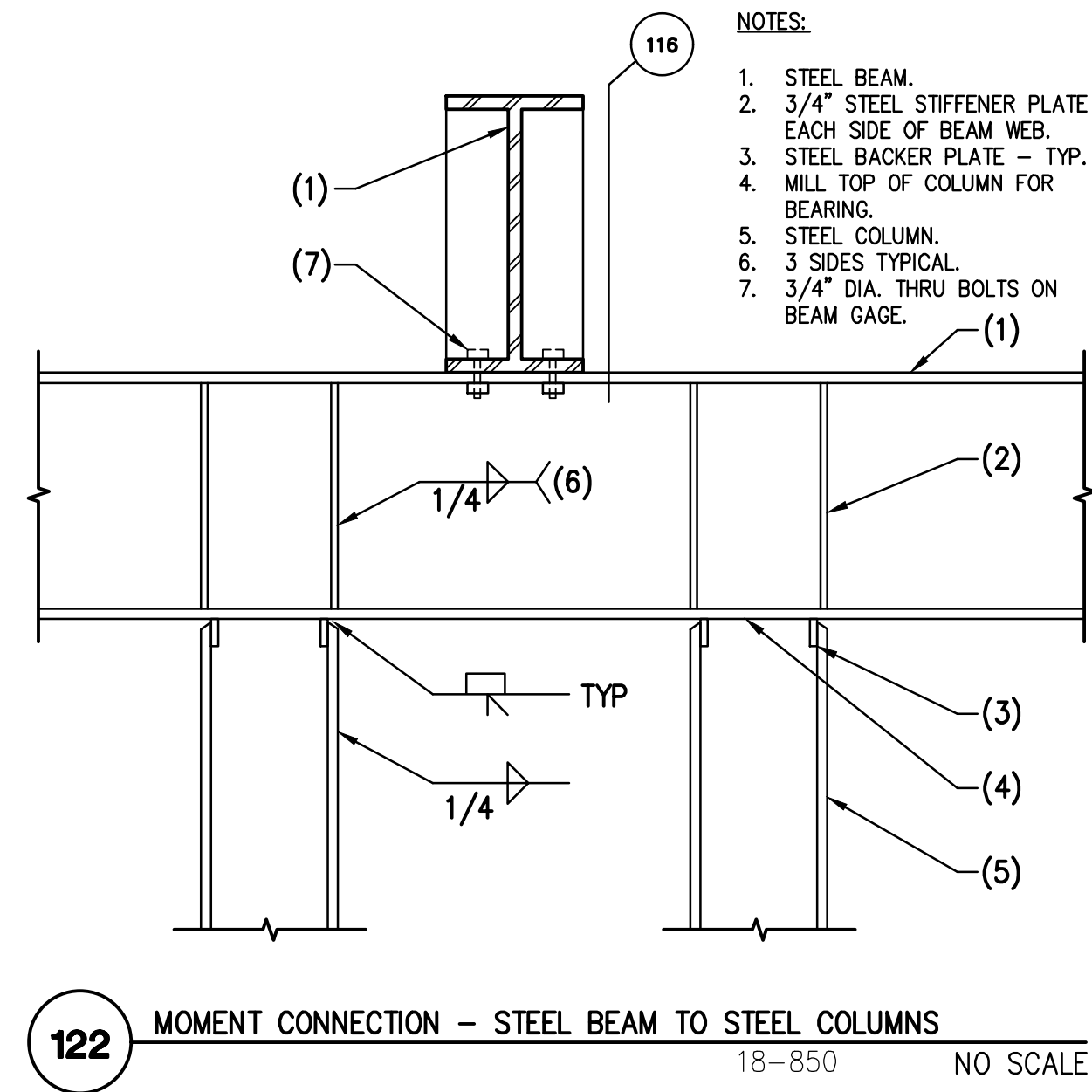
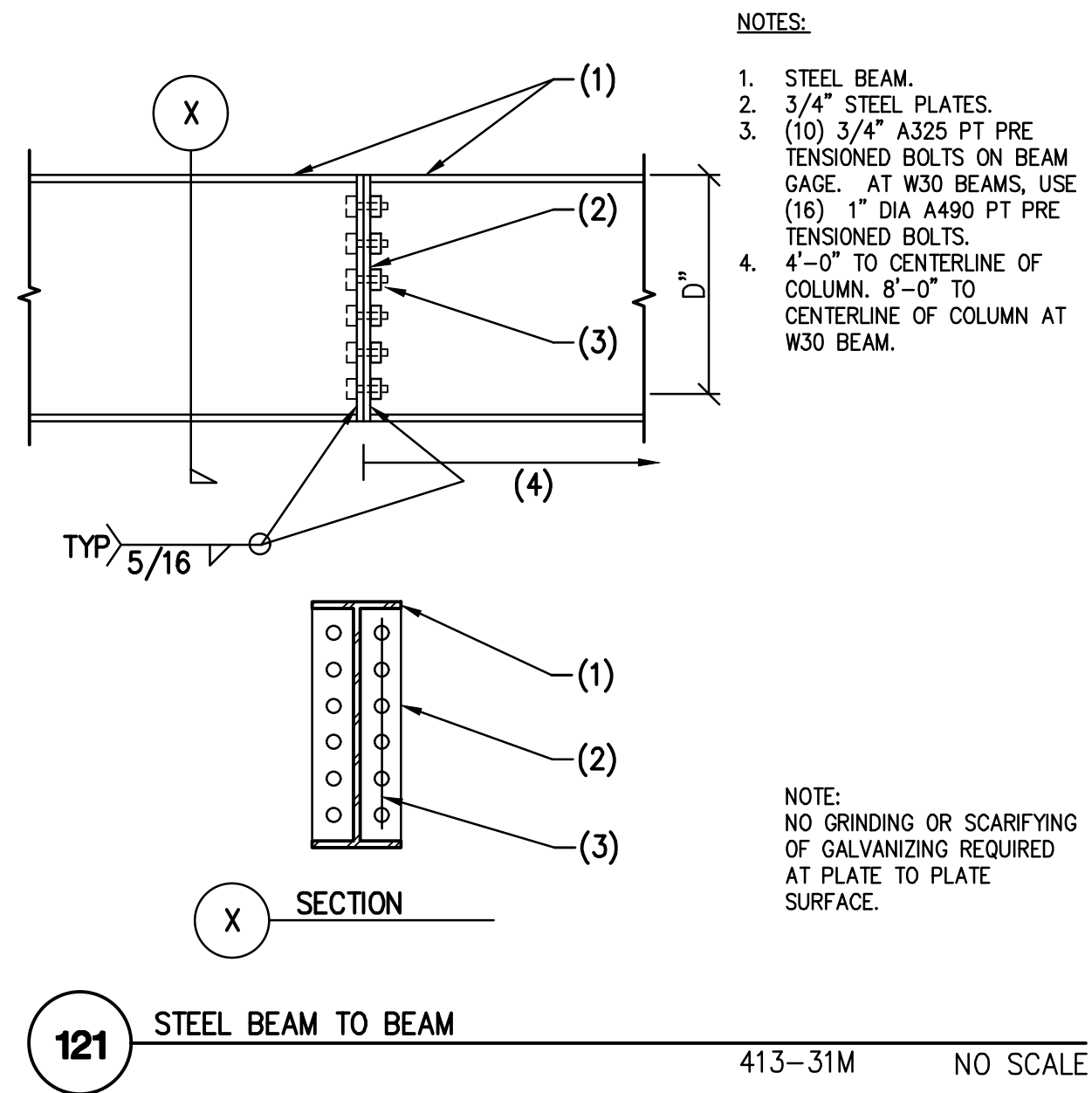
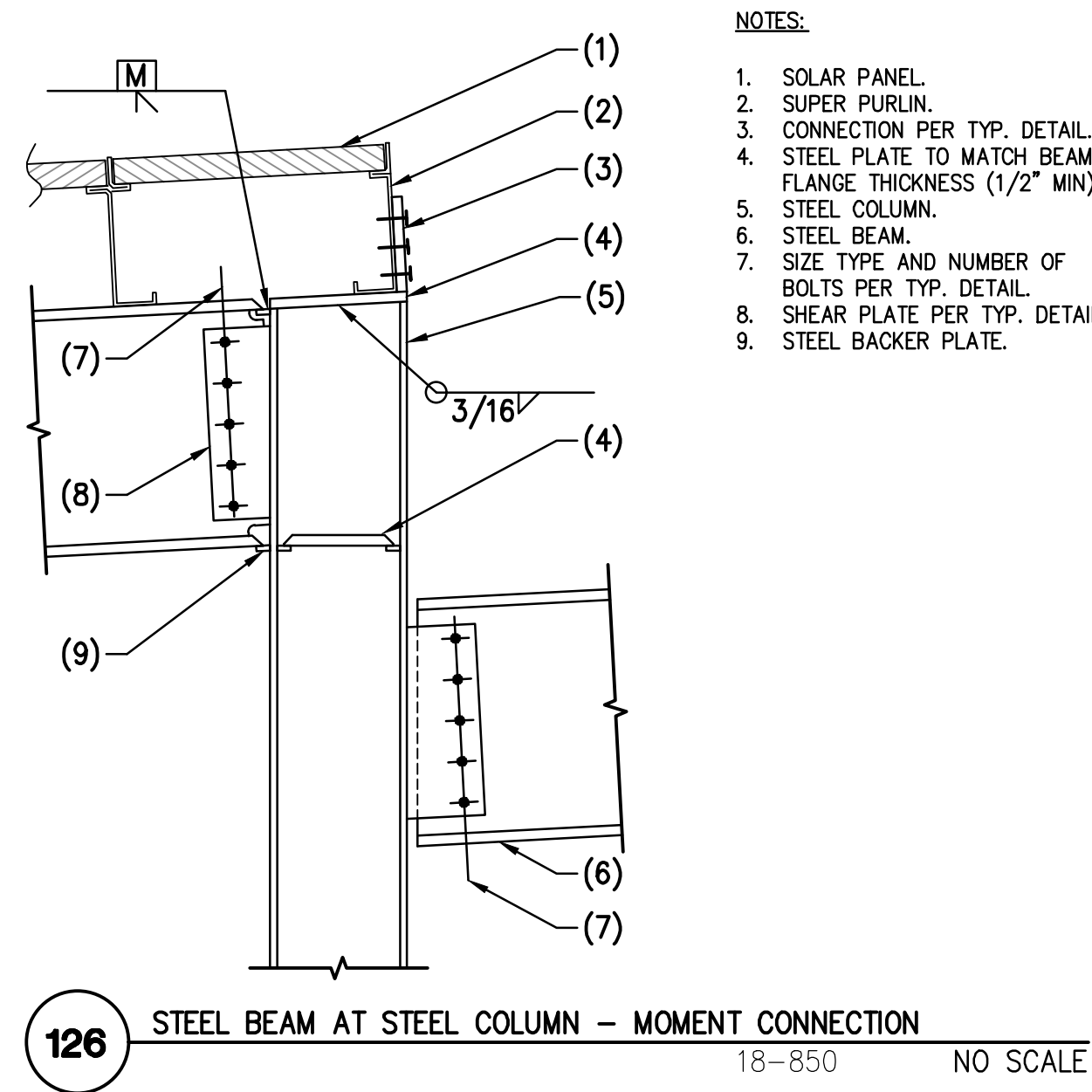
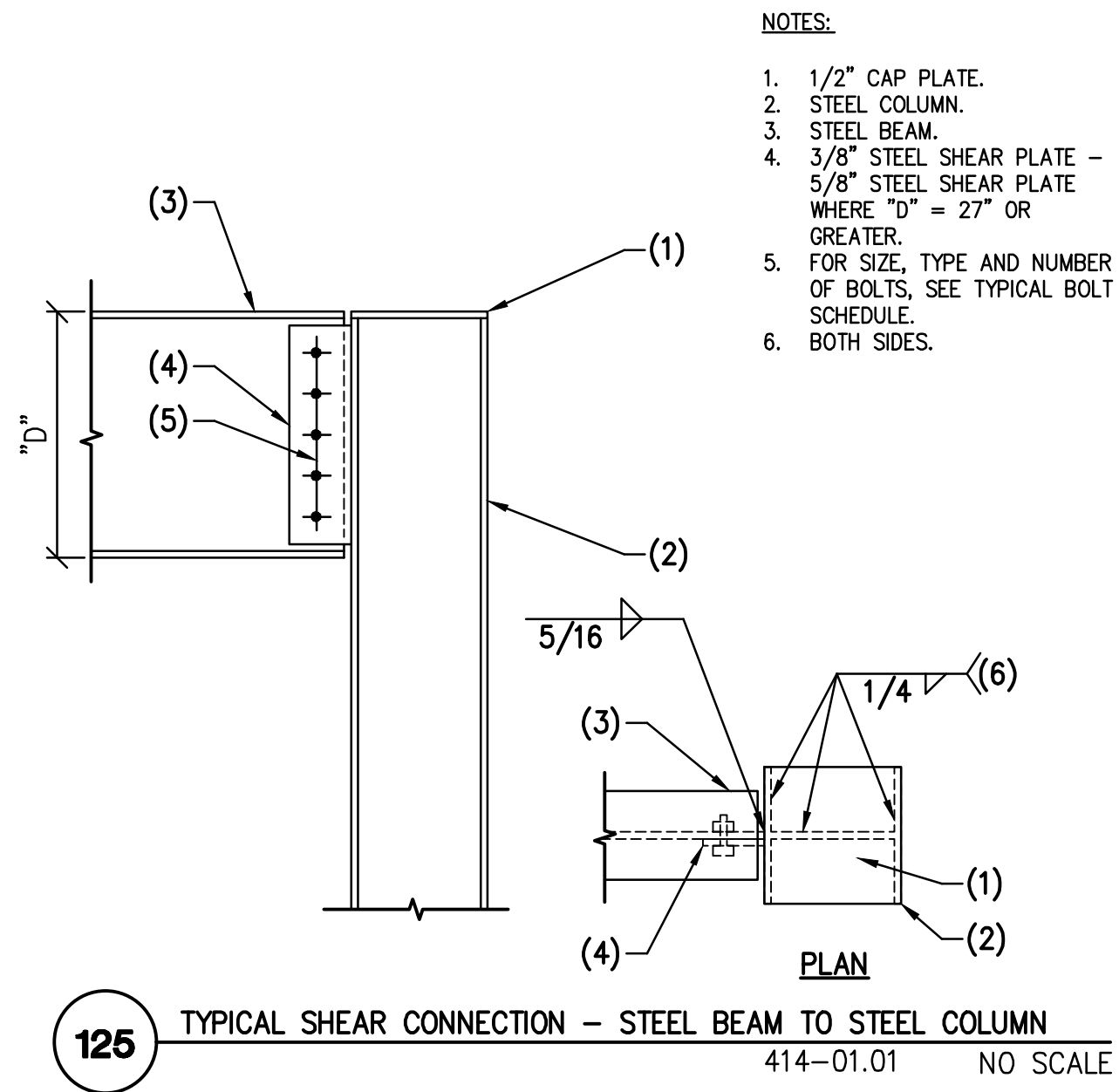
BUC CAMPUS PARKING GARAGE SOLAR STRUCTURE
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ST. LOUIS, MO 63110
DETAILS

REVISIONS:

JOB NUMBER:	18-850
DRAWN:	ENGINEER: JSB
CHECKED:	SCALE: PGS AS NOTED
DATE:	11-15-2018
SHEET:	S3.0

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DETAILS



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DRAWN: JSB	ENGINEER: DJB
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SHEET: S3.1	