WHATCOM COUNTY
Planning & Development Services
5280 Northwest Drive,
Bellingham, WA 98226-9097
360-778-5900, TTY 800-833-6384
360-778-5901 Fax

Mark Personius, AICP
Director

PRE2023-00097 ABC Recycling

Commercial Building Permit Application

Building # 3

One Structure per Permit

Permit #_________________

Agent/Contact Name: Impact Design (Scott Goodall, MS PE)
Mailing Address: 5426 Barrett Road, Suite A103 City Ferndale
State WA Zip Code 98248 Phone # ( ) 360-389-8138
Email scott@bold-impact.com

Property Owner Name ABC Recycling Realty Corp (Andy Anthony, Vice President Operations)
Mailing Address: 2219 Rimland Drive, Suite 301 City Bellingham
State WA Zip Code 98226 Phone # ( ) 360-622-1682
Email andy.anthony@abcrecycling.com

Contractor Name To be determined
Business Name: NA License#: NA
Mailing Address: NA City
State NA Zip Code NA Phone # ( ) NA
Email NA

Site Information

Assessor's Parcel # 3802231063740000 Div# NA Block# NA Lot# NA
Subdivision Name: Enoch Compton Don Claim (not subdivided)
Site address 741 Marine Drive, Bellingham WA 98226
Number of Buildings currently on site: 0
Valuation (cost of completed project less value of land) $ 1,500,000

Project Description *(example: New 2400 sq. ft. Warehouse w/ office space)*

This project will construct a full-service metal processing facility. Scrap metal will be processed & clean scrap metal will be exported by rail, truck and barge.

■ New ☐ Addition ☐ Remodel ☐ Repair ☐ Change of Occupancy ☐ Tenant Improvement

Building Height: (in feet) 34' 4-1/4" # of Stories: 1 # Employees: 15 # Parking Spaces: 18
Company Vehicles: 2 Note: # of employees/parking spaces & vehicles are for entire complex

Please Check Applicable Water & Sanitary Services: Water: ☐ Well ☐ Water Assoc.
■ Water District Name of Water Purveyor (if applicable): Whatcom Water Dist. #2

Fees will be assessed in accordance with the Whatcom County Unified Fee Schedule (UFS) in effect at the time of application submittal. Please contact Planning and Development Services to determine project specific fees. Click here to see the 2019/2020 UFS. Per UFS 2843 all permits and applications are subject to a Technology fee. The fee is calculated on the permit/application fees due.

Septic: ☐ Yes ☐ No / Septic Installed: ☐ Yes ☒ No

Sewer: ☒ Yes ☐ No Name of Sewer Purveyor (if applicable): City of Bellingham

Proposed Square Footages for this project (measured to outside wall):

Basement	0 sq.ft.	Main Floor	19,500 sq.ft.
Basement Type: ☐ Heated ☐ Unheated		Second Floor	0 sq.ft.
Other:	sq.ft.	**Total Square Feet**	19,500 sq.ft.

Heat Source (Check the primary fuel source for Heat / Hot Water)

Heating: ☒ Natural Gas ☐ Propane ☒ Electric ☐ Oil ☐ Geothermal ☐ Other

Hot Water: ☒ Natural Gas ☐ Propane ☒ Electric ☐ Oil ☐ Geothermal ☐ Other

Driveway Access and Utility Connection (work within the county right-of-way)

Does your project involve any work within the County road right-of-way (example: a new driveway or connection to utilities)? ☒ Yes ☐ No

If yes, please describe: A single driveway (for all buildings), W & SS will connect the site to Marine Drive.

Please note: If upon inspection PW Encroachment staff determines an additional Encroachment Permit is required; you will be notified and received an invoice for the fees.

List materials used in the process of business activity (be specific & list quantities used or stored)

Scrap Metals (Ave/day)	7.2 tons (full operations)	Processed
Scrap Metals (Typ stored)	0 tons (normal operations)	Stored on site

Any proposed fill, excavation or clearing must be noted below *

FILL	The deposit of earth material by artificial means.					
BY FEET	**Length (ft)**	**Width (ft)**	**Depth (ft)**	**Volume (ft³)**	**÷ By 27**	**= Cubic Yard**
Septic	0	x 0	x 0	= 0	/ 27 =	0 CY
Driveway/Road/Parking	0	x 0	x 0	= 0	/ 27 =	0 CY
Building site	170	x 85	x 1.5	= 21,675	/ 27 =	803 CY
Other	0	x 0	x 0	= 0	/ 27 =	0 CY
MATERIAL SOURCE:	Local Permitted Gravel Mine				**TOTAL VOLUME:**	803 CY

EXCAVATION	The mechanical removal of earth materials. Grading is an excavation or filling or combination thereof. Earth material is any rock, natural soil, fill, or any combination thereof.					
BY FEET	**Length (ft)**	**Width (ft)**	**Depth (ft)**	**Volume (ft³)**	**÷ By 27**	**= Cubic Yard**
Septic	0	x 0	x 0	= 0	/ 27 =	0 CY
Driveway/Road/Parking	0	x 0	x 0	= 0	/ 27 =	0 CY
Building site	170	x 85	x 1.5	= 21,675	/ 27 =	803 CY
Ditching/Trenching	0	x 0	x 0	= 0	/ 27 =	0 CY
Other	0	x 0	x 0	= 0	/ 27 =	0 CY
MATERIAL DESTINATION:	Local Permitted Fill Site				**TOTAL VOLUME:**	803 CY

* Cut/Fill for individual building permit only! All SITE cut/fill are included with permit for Building #1

CLEARING/CONVERSION	Defined as, "the destruction of vegetation by manual, mechanical, or chemical methods resulting in exposed soils. WCC20.97.053
Required **TOTAL AREA TO BE CLEARED and/or GRUBBED, IN ACRES**:	
AREA OF TREE CLEARING, IN ACRES: 0	
TIMBER USE Personal Use: 0 % Sell: 0 % Burn: 0 % Give Away: 0 %	
FPA NUMBER (if applicable) NA	
If your project includes any tree cutting, a Forest Practices Application / Notification may be required. For questions related to permit requirements, contact the Washington Department of Natural Resources (DNR) at 360-856-3500.	

RECEIVED

Date: 10/24/2023 Staff: AHK

Please complete the following Agent Authorization only if an agent (someone other than the property owner) is applying for permit(s) on the property owner's behalf.

Agent Authorization

If you are authorizing an agent to apply for permits on your behalf you must complete this form and have it notarized, which will provide authorization for a designated agent to apply for permits on your behalf.

I/we, ABC RECYCLING REALTY CORP., the owner(s) of the subject property, understand by completing this form I/we hereby authorize Scott Goodall to act as agent. I/we understand said agent will be authorized to submit applications on my behalf, and any fees associated with submitted applications are due to me and not to the said agent. I/we also understand once an application has been submitted all future correspondence will be directed to the agent.

ANDREW ANTHONY Property Owner Printed Name	Property Owner Printed Name
Property Owner Signature	Property Owner Signature
10/04/2023 Date	Date

I certify that I know or have satisfactory evidence that Andrew Anthony is/are the person(s) who appeared before me, and said person(s) acknowledged it to be his/her free and voluntary act for the uses and purposes mentioned in this instrument.

Dated 10/04/2023

Notary Public Signature

Notary Public
State of Washington
KENDRA I HAWKINS
MY COMMISSION EXPIRES
AUGUST 18, 2025

Kendra I Hawkins
Notary Public Printed Name
Notary Public in and for the State of Washington
Residing at Whatcom Co.
My appointment expires: Aug/ 18/ 2025

Disclaimer

The permitee verifies, acknowledges and agrees by their signature that:

1) If this permit is for installation of a dwelling, the dwelling is/will be served by potable water;
2) The property owner is the owner of this Whatcom County Permit;
3) The signatory is the property owner or someone who has permission to represent the property owner in this transaction;
4) All construction is to be done in accordance with Whatcom County codes or ordinances- *referenced codes and ordinances are available for review at Whatcom County Planning and Development Services*;
5) This Whatcom County Permit does not permit or approve any violation of federal, state or local laws, codes or ordinances;
6) Submission of plans or additional information and subsequent approval may be required before this application can be processed;
7) Notwithstanding that this application has been submitted in the name of a company, I personally guarantee payment (or guarantee **p**ayment on behalf of the client I am representing, noted on the Agent Authorization Form above) of the fees accrued according to the terms listed in the Whatcom County Unified Fee Schedule, including the Application of Fees from Different UFS Schedule Policy PL1-74-003Z, and agree to be bound personally as a principal and not as a surety. I recognize my personal guarantee is part of the consideration for review of the application.

Scott Goodall
Print Name

Owner or Agent Signature

10/21/23
Date

ABC RECYCLING BUILDING 3 RECLAMATION

741 MARINE DRIVE, Bellingham, WA

PROJECT CRITERIA

GENERAL SITE INFORMATION:

ADDRESS: 741 MARINE DRIVE, BELLINGHAM WA
PARCEL #S: 3802231063740000

THAT PTN OF ENOCH COMPTON DON CLAIM DAF-BEG ON SLY LI OF MARIETTA RD 992.4 FT S-613.2 FT E OF NW COR SEC 23 BEING COR COMM TO SECS 14-15-22-23-TH S 25 DEG 50'00" W 1170 FT M/L TO GOVT MEANDER LI OF BELLINGHAM BAY-TH SELY FOL SD MEANDER LI TO SE COR OF
NEIGHBORHOOD:
SUB AREA: 2
ZONING: HEAVY IMPACT INDUSTRIAL

PROJECT DESCRIPTION/WORK TO BE PERFORMED:

NEW CONSTRUCTION OF A PRE ENGINEERED METAL BUILDING

GENERAL BUILDING INFORMATION:

TYPE OF CONSTRUCTION: IIB
NUMBER OF STORIES: 1 STORY
OCCUPANCY CLASSIFICATION(S): F-2
MIXED OCCUPANCY
COMPLIANCE METHODS: FIRE PROTECTED SEPARATIONS
SPRINKLER SYSTEM: NOT PROVIDED
ALLOWABLE BUILDING HEIGHT:
ACTUAL BUILDING HEIGHT: 34'-4.25"
HEAT TYPE: NON HEATED

Site Coverage Information

SEE CIVIL PLANS

PARKING REQUIREMENTS: (TOTAL PROJECT)

1 PER EMPLOYEE/SHIFT = 15 PER SHIFT =15 STALLS

PARKING PROVIDED =18 STALLS INCL. 2 H.C.

DEFERRED SUBMITTAL ITEMS:

1. PRE FAB STEEL BUILDING PLANS & ENGINEERING

APPLICABLE BUILDING CODES:

2018 INTERNATIONAL BUILDING CODE AND AMENDMENTS – CHAPTER 51-50 WAC
2018 INTERNATIONAL MECHANICAL CODE AND AMENDMENTS – CHAPTER 51-52 WAC
2018 INTERNATIONAL FUEL GAS CODE AND AMENDMENTS – CHAPTER 51-52 WAC
2018 INTERNATIONAL ENERGY CONSERVATION CODE (WECC) AND AMENDMENTS – CHAPTER 51-11C & 51-11R WAC
2017 NATIONAL FUEL GAS CODE (NFPA 54) – CHAPTER 51-52 WAC
2018 UNIFORM PLUMBING CODE (UPC) AND AMENDMENTS – CHAPTERS 51-56, 51-57 WAC
2020 NATIONAL ELECTRIC CODE (NFPA 70) -- CHAPTER 296-46B WAC
2018 INTERNATIONAL FIRE CODE (IFC) AND AMENDMENTS – CHAPTER 51-54 WAC
THE IFC IS ADOPTED AND AMENDED PER REGULATIONS SET FORTH IN BMC 17.20.

ALLOWABLE AREA (PER IBC TABLE 506.2) (MOST RESTRICTIVE USE):

BASIC AREA ALLOWANCE NS, IIB, (F2) =23000 SF PER FLOOR

ACTUAL AREA =25095 SF
ALLOWABLE WITH AREA INCREASE =40250 SF

BASIC STORY ALLOWANCE NS, IIB, (F2) =2 STORIES
ACTUAL STORY =1 STORY

BUILDING COMPLIES WITH AREA AND STORIES

ALLOWABLE AREA CALCULATIONS (IBC 506.2.4):

AREA INCREASE (506.2.1, EQUATION 5-1):
SINGLE OCCUPANCY ONE-STORY BUILDING

F=PERIMETER OF OPEN SPACE = 760ft
W1=78', W2=527', W3=220', W4=924'
W=(L1xW1, L2xW2, L3xW3, L4xW4)/F
W=(78*280 + 100*527 + 220x180 + 100*924)/760
W=(206540)/760 = 271 ft (30ft MUST BE USED)

I(f) = INCREASE FACTOR FOR FRONTAGE = (F/P-0.25) x W/30
I(f) = [(1053ft/1053ft) - 0.25] x 30ft/30 = 0.75

$A_a = A_t + (N_s x I_f)$
Aa = 23000 + (23000x0.75) **=40250 SF**
ALLOWABLE AREA =40250 SF

OCCUPANT LOADS (IBC 1004.1.2):

OCCUPANT LOAD 200 SF (GROSS) = 25095/200 =125 OCC.

DRAWING SHEET LIST

Sheet List	
Sheet Number	Sheet Name
A1.0	Cover Sheet
A1.1	General Notes
A1.3	Site Plan
A2.0	Floor Plan
A3.0	Elevations
A3.2	Perspective Views
A4.0	Building Section
A5.0	Roof & RCP Plan

STRUCTURAL SHEETS:
SEE STRUCTURAL COVER SHEET

CIVIL SHEETS:
SEE CIVIL COVER SHEET

BUILDING MANUFACTURER:
SEE MANUFACTURER COVER SHEET

PROJECT TEAM

ARCHITECT:
TRC ARCHITECTURE, LLC
ROBERT MATICHUK
PO BOX 1075
BELLINGHAM, WA 98227
p/f: 360.393.3131

OWNER:
A B C RECYCLING REALTY CORP
2219 RIMLAND DR STE 301
BELLINGHAM, WA 98226-8759

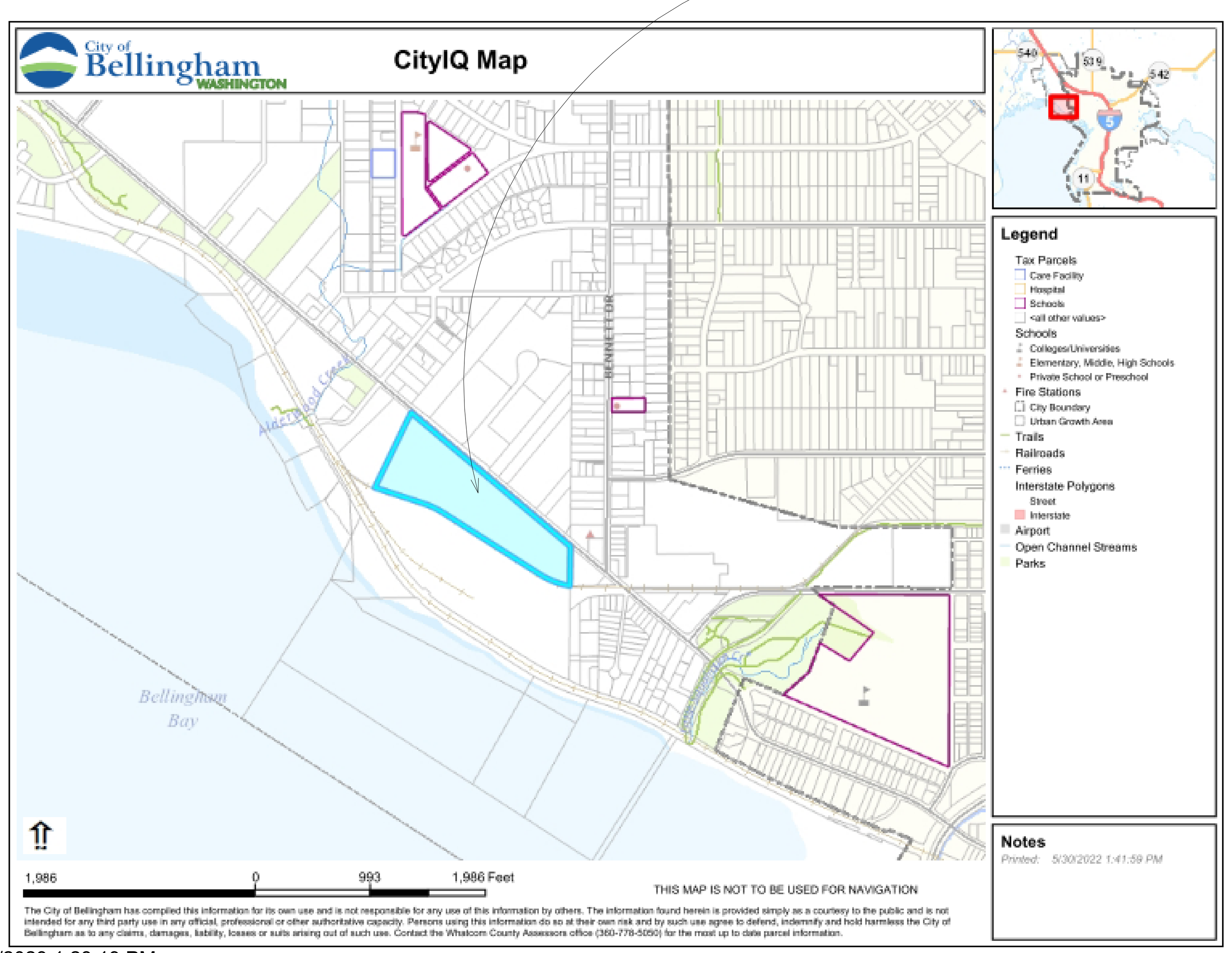
GENERAL CONTRACTOR:
T.B.D.

BUILDING JURISDICTION:
WHATCOM COUNTY
BUILDING SERVICES
5280 NORTHWEST DR.
BELLINGHAM, WA 98226
360.778.5900

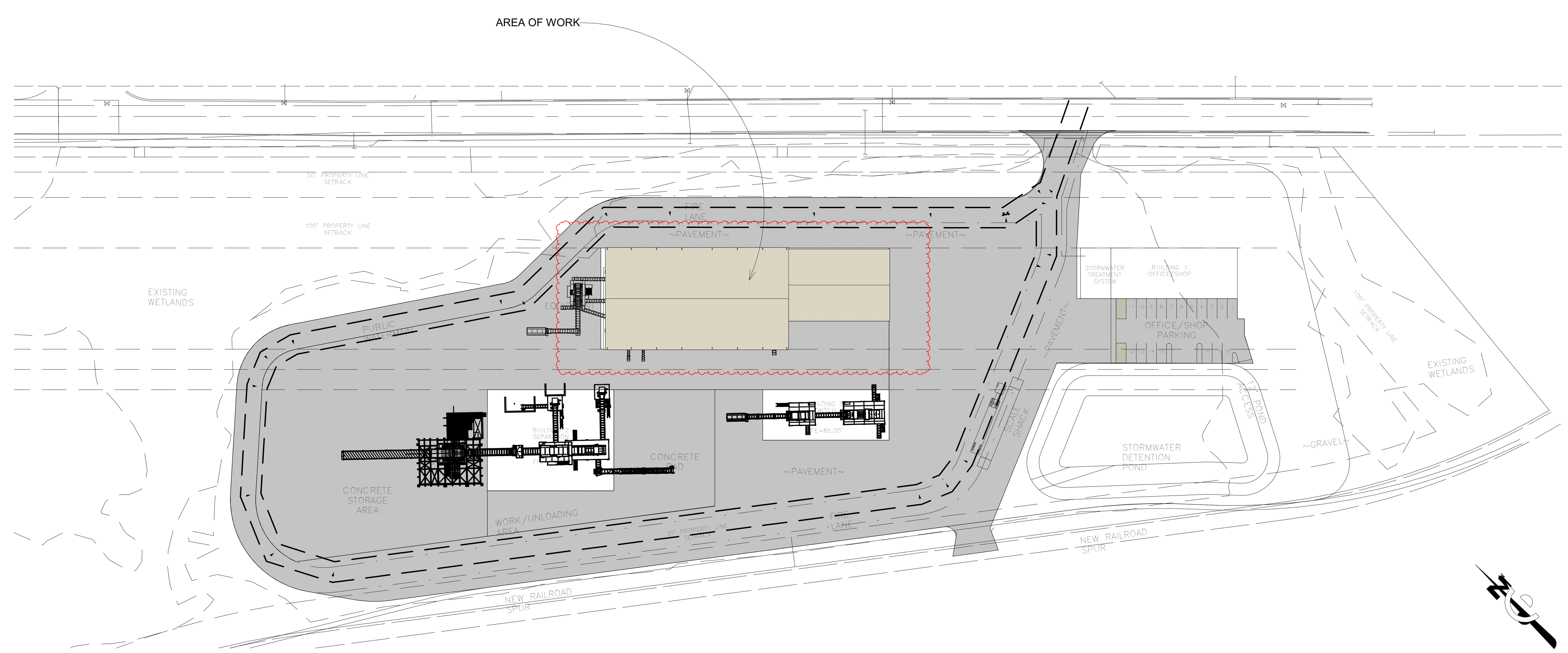
STRUCTURAL ENGINEER:
Brandon Hausmann, PE
Principal
Direct: (360) 474-7541
Office: (360) 200-8703 ex 1
203 W. Chestnut St.
Bellingham WA 98225

CIVIL ENGINEER:
Scott Goodall, MS, PE
Principal
Impact Design, LLC
5426 Barrett Road, Suite A103
Ferndale, WA 98248
(360) 389-8138
www.bold-impact.com

AREA OF WORK



AREA OF WORK



2 Site -Cover Sheet
1" = 80'-0"

10/20/2023 1:23:19 PM

www.trcarchitecture.com
PO Box 1075
Bellingham, WA 98227
360.393.3131
trc architecture

7852 REGISTERED ARCHITECT
ROBERT K. MATICHUK
STATE OF WASHINGTON

Custom Design For: ABC RECYCLING
Building 3 Reclamation
741 Marine Dr
Bellingham WA 98226

Project number	TRC 22-001
Date	Oct 20 2023
Design	RKM
Drawn by:	RKM
Checked by:	RKM
Set Description:	
Permit Set	

Cover Sheet

A1.0

ABBREVIATIONS

A
ADJ ADJACENT
A.F.F. ABOVE FINISH FLOOR
A.F.G. ABOVE FINISH GRADE

B
BLK BLOCKING
B.O. BOTTOM OF

C
CL CENTERLINE
CLR CLEAR
CLG CEILING
CONC CONCRETE
COL COLUMN
CONT CONTINUOUS
CONST CONSTRUCTION
CTR COUNTER

D
DTL DETAIL
DIM DIMENSION
DWG DRAWING

E
ELEC ELECTRICAL
EQ EQUAL
EXST'G EXISTING
ENG ENGINEER

F
F.F. FINISH FLOOR
F.C.I.C FURNISHED BY CONTRACTOR INSTALLED BY CONTRACTOR
F.O.I.C FURNISHED BY OWNER INSTALLED BY CONTRACTOR
F.O.I.O. FURNISHED BY OWNER INSTALLED BY OWNER
F.R. FIRE RESISTANT
F.E. FIRE EXTINGUISHER
FBGL. FIBERGLASS
F.O.W. FACE OF WALL

G
GA GAUGE
G.C. GENERAL CONTRACTOR
GLAM GLUE LAMINATE
GYPBD GYPSUM WALL BOARD

H
HDWR HARDWARE
HDR HEADER
H.M. HOLLOW METAL
HGT HEIGHT

I
INST. INSTALL / INSTALLED
INSUL. INSULATION

M
MAT MATERIAL
MECH MECHANICAL
MLV MICRO LAMINATE WOOD
MIN. MINIMUM

N
N/A NOT APPLICABLE
N.I.C. NOT IN CONTRACT
N.T.S. NOT TO SCALE

P
PL PLATE LINE
PLYWD. PLYWOOD
P-LAM PARALLEL LAMINATE WOOD
PT PRESSURE TREATED

R
REQ'D REQUIRED
REV. REVISION/REVISED

S
SCH'D SCHEDULE
SIM SIMILAR
S.O.G. SLAB ON GRADE
SQ.FT. SQUARE FOOT
SUSP. SUSPENDED

T
TEMP TEMPERED
TYP TYPICAL
T.O. TOP OF

V
V.I.F. VERIFY IN FIELD

CONSTRUCTION NOTES:

1. APPLICABLE BUILDING CODES VERIFY LOCAL ZONING AND BUILDING CODES PRIOR TO BEGINNING CONSTRUCTION.
2. ALL MECHANICAL (INCL. FIRE SPRINKLERS) , ELECTRICAL AND PLUMBING BID-DESIGN UNDER SEPARATE PERMIT TO COMPLY WITH ALL APPLICABLE LOCAL CODES.
3. DO NOT SCALE DRAWINGS. CONSULT BUILDING DESIGNER AND OWNER FOR ANY DIMENSIONAL CLARIFICATIONS, ERRORS OR CONFLICTS. FLOOR PLANS TAKE PRECEDENCE OVER ELEVATIONS IF CONFLICTING. GENERAL CONTRACTOR MUST VERIFY DIMENSIONS PRIOR TO PROCEEDING.
4. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COORDINATION OF WORK BETWEEN SUB-CONTRACTOR TRADES, AND FOR PROVIDING WEATHER-TIGHT SEALS, FLASHING AND CAULKING AT ALL CONNECTIONS AND PENETRATIONS. REFER TO IBC CHAPTER 11 FOR MINIMUM WEATHER PROTECTION REQMTS., INCLUDING, BUT NOT LIMITED TO, HEAD FLASHING AT ALL OPENINGS.
5. PROVIDE ENGINEERED SHOP DRAWINGS FOR ALL TRUSSES, TRUSS TYPE JOISTS, STEEL BEAMS AND GLU-LAM BEAMS. SUBMIT TO ENGINEER FOR REVIEW.
6. THESE DRAWINGS ARE BID-DESIGN DOCUMENTS. THE OWNER/DEVELOPER AND CONTRACTOR SHALL ASSUME RESPONSIBILITY, LIABILITY AND INDEMNIFY THE BUILDING DESIGNER FOR COORDINATION OF BID-DESIGN WORK, INCLUDING BUT NOT LIMITED TO GENERAL CONSTRUCTION, ELECTRICAL, PLUMBING, HEATING AND VENTILATION. THE BUILDING DESIGNER IS NOT LIABLE FOR CHANGES/CORRECTIONS MADE BY ON SITE INSPECTION DURING THE COURSE OF CONSTRUCTION OR FOR DETAILS AND SPECIFICATIONS NOT INCLUDED.
7. THE CONTRACTOR SHALL UTILIZE CONSTRUCTION TECHNIQUES AND PRACTICES STANDARD AND ACCEPTABLE TO THE CONSTRUCTION INDUSTRY. THE BUILDING DESIGNER DOES NOT ASSUME LIABILITY OR RESPONSIBILITY FOR METHODS OF CONSTRUCTION DETAILS & SPECIFICATIONS NOT INCLUDED IN THESE BUILDING PERMITS ONLY CONTRACT DOCUMENTS.
8. THE BUILDING DESIGNER HAS NOT BEEN RETAINED OR COMPENSATED TO PROVIDE DESIGN AND/OR CONSTRUCTION REVIEW SERVICES RELATING TO THE CONTRACTOR'S SAFETY PRECAUTIONS OR TO MEANS, METHODS, TECHNIQUES OR PROCEDURES REQUIRED FOR THE CONTRACTOR TO PERFORM HIS WORK. THE UNDERTAKING OF PERIODIC SITE VISITS BY THE BUILDING DESIGNER SHALL NOT BE CONSTRUED AS SUPERVISION OF ACTUAL CONSTRUCTION NOR MAKE HIM RESPONSIBLE FOR THE PERFORMANCE OF WORK BY THE CONTRACTOR OR CONTRACTORS EMPLOYEES, OR EMPLOYEES OF SUPPLIERS OR SUBCONTRACTORS, OR FOR ACCESS, VISITS, USE, WORK, TRAVEL OR OCCUPANCY BY ANY PERSON.
9. THESE DOCUMENTS HAVE BEEN PREPARED FOR A NEGOTIATED CONSTRUCTION CONTRACT, AND MAY LACK SOME DETAIL AND SPECIFICATIONS REQUIRED FOR A COMPLETE COMPETITIVE BID SELECTION PROCESS.
10. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING BUILDING AND SITE SECURITY DURING CONSTRUCTION PERIODS.
11. WHERE A CONSTRUCTION DETAIL IS NOT SHOWN OR NOTED, THE DETAIL SHALL BE THE SAME AS FOR OTHER SIMILAR WORK.
12. THE CONTRACTOR MUST VERIFY THE ROOF SYSTEM IS CONSTRUCTED PER MANUFACTURES REQUIREMENTS TO CREATE A WEATHERPROOF AND WATERPROOF ROOF. VERIFY INSTALLATION OF ALL ROOF PENETRATIONS, CURBS, CANTS & FLASHING TO PROPERLY SHED WATER AND STOP WIND DRIVEN RAIN & SNOW. VERIFY ENTIRE ROOF SYSTEM IS DESIGNED & CONSTRUCTED TO ALLOW FOR THE PROPER EXPANSION & CONTRACTION OF THE SUPPORTING STRUCTURE & THE ROOF SYSTEM. CONDENSATION WILL BE CREATED ON THE HEATED SIDE OF ALL ROOF SYSTEMS SURFACES AND PARTS; THEREFORE, CARE MUST BE TAKEN TO PROPERLY INSTALL THE CORRECT INSULATION, VENTILATION AND VAPOR BARRIERS.
13. CONTRACTOR IS TO VERIFY STRUCTURAL INFORMATION, SPECIFICATIONS AND DETAILS WITH THE STRUCTURAL ENGINEER AND/OR ATTACHED STRUCTURAL SHEET(S). FAILURE TO VERIFY MAY RESULT IN CONFLICTING INFORMATION CONTAINED ON THE ARCHITECTURAL SHEETS. THE DESIGNER DOES NOT TAKE RESPONSIBILITY FOR STRUCTURAL COMPONENTS OR CALCULATIONS.

FRAMING (STRUCTURAL NOTES TO TAKE PRIORITY):
1. THIS STRUCTURE TO COMPLY WITH MINIMUM NAILING SCHEDULE PER ENG. CALCS, OR IBC TABLE 2304.6.1.
2. SOLID BLOCKING REQUIRED AT ALL BEARING POINTS OF FLOOR, CEILING & ROOF SYSTEMS.
3. PROVIDE APPROVED ANCHORAGE OF BEAMS OR GIRDERS TO POSTS.
4. T.J.I. OR EQUIVALENT FLOOR JOISTS. FLOOR JOIST DESIGN BY LICENSED WASH. STATE MANUFACTURER. FLOOR JOIST DESIGN AND SPECIFICATIONS INCLUDING ALL METAL CONNECTORS. HANGERS AND CLIPS TO BE ON-SITE DURING CONSTRUCTION AND INSTALLED AS PER MANF. INSTRUCTIONS.
5. ALL WINDOW AND DOOR HEADERS TO BE 4x10 DF-2 IN A ONE-FLOOR OR THE TOP FLOOR OF A MULTI-FLOOR BLD. 6x10 FOR BASEMENTS AND OTHER FLOORS OTHER THAN THE TOP FLOOR. UNLESS NOTED OTHERWISE BY ENGINEER OF RECORD.
6. FRAMING LUMBER: KD, 19 % MAX MOISTURE CONTENT, S4S GRADE TO WWPA. AND IRC SPECIFICATIONS. DOUGLAS FIR-LARCH IS PREFERRED. MINIMUM GRADED STRESS VALUES: 2x STUDS @ 1200 PSI; JOISTS AND RAFTERS @ 1250 PSI; POSTS A 700 PSI, SAWN BEAMS @ 1300 PSI. NOMINAL SIZES, MAXIMUM SPANS, SPACING, BLOCKING AND OTHER DETAILING IN COMPLIANCE WITH INTERNATIONAL BUILDING CODE.
7. PRESSURE TREATED LUMBER: WOLMANIZED, CCA PRESSURE TREATED LUMBER AT MUD SILLS, EXPOSED DECK FRAMING, EXTERIOR STRUCTURAL POSTS, POSTS SUPPORTING MAIN FLOOR STRUCTURE, AND OTHER WOOD / CONCRETE CONTACT LOCATIONS.
8. ROOF TRUSSES: FACTORY FABRICATED GANG-NAILED WOOD TRUSSES, ENGINEERED BY MFR. FOR SITE WIND LOADING AND COMBINED NORMAL LOADS SPANS AND CONFIGURATIONS AS SHOWN ON DRAWINGS AND AS REQUIRED.
9. GLUE LAMINATED BEAMS (GLB):DOUGLAS FIR, 24F-V4, BUILDING DESIGN RURAL APPEARANCE (ONLY IF EXPOSED) GRADE LEAVE PROTECTIVE WRAP IN PLACE UNTIL FINISH PROCESSES ARE UNDERWAY.
10. ANCHORS: SIMPSON PLY CLIPS AT EDGES OF ROOF SHEATHING PANELS, MID-SPAN BETWEEN RAFTERS OR TRUSSES; TRUSS/PLATE HOLD DOWNS AT EACH BEARING AND OTHER INTERSECTION AS REQUIRED.
11. STUDS: EXTERIOR WALL STUDS ARE TO BE 2"x6"s OF B FIR KILN DRIED SPACED AT 16" O.C. INTERIOR STUDS ARE TO BE 2"x4"s OF B FIR KILN DRIED SPACED AT 16" O.C. STUDS IN BEARING WALLS ARE LIMITED TO 10 FEET IN HEIGHT UNLESS APPROVED BY ENGINEER.

STAIRS:
1. IBC 1005 & 1011
2. IBC 1011.2 STAIRWAY WIDTH. THE WIDTH OF THE STAIRWAYS SHALL BE DETERMINED AS SPECIFIED IN SECTION 1005.1, BUT SUCH WIDTH SHALL NOT BE LESS THAN 44 INCHES. EXCEPTION: STAIRWAYS SERVING AN OCCUPANT LOAD OF LESS THAN 50 SHALL HAVE A WIDTH OF NOT LESS THAN 36 INCHES.
3. IBC 1011.3 HEADROOM. STAIRWAYS SHALL HAVE A MINIMUM HEADROOM CLEARANCE OF 80 INCHES MEASURED VERTICALLY FROM A LINE CONNECTING THE EDGE OF THE NOSINGS. SUCH HEADROOM SHALL BE CONTINUOUS ABOVE THE STAIRWAY TO THE POINT WHERE THE LINE INTERSECTS THE LANDING BELOW, ONE TREAD DEPTH BEYOND THE BOTTOM RISER. THE MINIMUM CLEARANCE SHALL BE MAINTAINED THE FULL WIDTH OF THE STAIRWAY AND LANDING.
4. IBC 1011.5.2 RISER HEIGHT AND TREAD DEPTH. STAIR RISER HEIGHTS SHALL BE 7 INCHES MAXIMUM AND 4 INCHES MINIMUM. THE RISER HEIGHT SHALL BE MEASURED VERTICALLY BETWEEN THE LEADING EDGES OF ADJACENT TREADS. RECTANGULAR TREAD DEPTHS SHALL BE 11 INCHES MINIMUM MEASURED HORIZONTALLY BETWEEN THE VERTICAL PLANES OF THE FOREMOST PROJECTION OF ADJACENT TREADS AND AT A RIGHT ANGLE TO THE TREAD'S LEADING EDGE. WINDER TREADS SHALL HAVE A MINIMUM TREAD DEPTH OF 11 INCHES MEASURED BETWEEN THE VERTICAL PLANES OF THE FOREMOST PROJECTION OF ADJACENT TREADS AT THE INTERSECTIONS WITH THE WALKLINE AND A MINIMUM TREAD DEPTH OF 10 INCHES WITHIN THE CLEAR WIDTH OF THE STAIR.

DECKS:
1. WOOD DECK CONSTRUCTION SHALL BE OF WOLMANIZED / PRESSURE TREATED WOOD. DECKING (SEE PLANS) DECK RAILINGS (REQUIRED IF DECK IS 30" ABOVE GRADE) SHALL BE A MINIMUM OF 42" IN HEIGHT WITH A MAXIMUM OF 4" SPACING BETWEEN PICKETS. PER IBC 1015.
2. METAL OR BOLT ON DECK CONSTRUCTION SHALL BE A DEFERRED SUBMITTAL IN ALL CASES.

DISCLOSURE:
1. THE PLAN REVIEW GUIDE INCLUDED WITH YOUR PERMIT DOCUMENTS CONTAINS A LISTING OF COMMON CODE ERRORS AND OMISSIONS. APPROVAL OF THE PLANS DOES NOT PERMIT THE VIOLATION OF ANY BUILDING, MECHANICAL, PLUMBING, ELECTRICAL, FIRE, OR ZONING CODE OR ANY OTHER FEDERAL, STATE, OR CITY REGULATIONS.
2. CONTRACTOR TO VERIFY LOCATIONS OF EXISTING SMOKE DETECTORS. ENSURE FULL COMPLIANCE WITH CURRENT FIRE CODE.
3. CONTRACTOR IS TO SECURE BUILDING SITE/LOCATION. VERIFY STRUCTURAL AND NON-STRUCTURAL COMPONENTS PRIOR TO COMMENCING CONSTRUCTION.
4. DO NOT SCALE THESE DRAWINGS. DISCREPANCIES WITH PROVIDED DIMENSIONS MUST BE COMMUNICATED TO THE DESIGN FIRM AT THE EARLIEST CONVENIENCE
5. TRC ARCHITECTURE (DESIGN FIRM) IS NOT RESPONSIBLE FOR EXISTING SITE CONDITIONS, DIMENSIONS, COMPLIANT OR NON-COMPLIANT CODE ISSUES, ETC.
6. ALL MARKUPS BY THE BUILDING / PLANNING DEPARTMENTS MUST BE FORWARD TO THE DESIGN FIRM PRIOR TO CONSTRUCTION COMMENCING.

VENTILATION NOTES

1203.1 GENERAL:
BUILDINGS SHALL BE PROVIDED WITH NATURAL VENTILATION IN ACCORDANCE WITH SECTION 1203.4, OR MECHANICAL VENTILATION IN ACCORDANCE WITH THE INTERNATIONAL MECHANICAL CODE.

MECHANICAL VENTILATION IS REQUIRED IN GROUP R OCCUPANCIES

1203.2 ATTIC SPACES:
ENCLOSED ATTICS AND ENCLOSED RAFTER SPACES FORMED WHERE CEILINGS ARE APPLIED DIRECTLY TO THE UNDERSIDE OF ROOF FRAMING MEMBERS SHALL HAVE CROSS VENTILATION FOR EACH SEPARATE SPACE BY VENTILATING OPENINGS PROTECTED AGAINST THE ENTRANCE OF RAIN AND SNOW. BLOCKING AND BRIDGING SHALL BE ARRANGED SO AS NOT TO INTERFERE WITH THE MOVEMENT OF AIR, A MINIMUM OF 1 INCH OF AIRSPACE SHALL BE PROVIDED BETWEEN THE INSULATION AND THE ROOF SHEATHING. THE NET FREE VENTILATING AREA SHALL NOT BE LESS THAN 1/300 OF THE AREA OF THE SPACE VENTILATED, WITH 50 PERCENT OF THE REQUIRED VENTILATING AREA PROVIDED BY VENTILATORS LOCATED IN THE UPPER PORTION OF THE SPACE TO BE VENTILATED AT LEAST 3 FEET ABOVE EAVE OR CORNICE VENTS WITH THE BALANCE OF THE REQUIRED VENTILATION PROVIDED BY EAVE OR CORNICE VENTS.

EARTHWORK NOTES

1. BUILDING BACKFILL: CLEAN GRANULAR SOIL MATERIAL, FREE OF STICKS, DEBRIS, TURF AND ROCKS OVER 6" DIAMETER.
2. GARAGE SLAB BALLAST: PIT RUN GRAVEL.
3. BASEMENT SLAB BALLAST: CLEAN SAND, OR PEA GRAVEL (8' BED).
4. FOOTING DRAINS: WASHED (3/4" MIN.) DRAIN ROCK, 12" MIN. COVER OVER PERIMETER DRAIN.
5. CRAWL SPACE BED: PEA GRAVEL OR CLEAN SAND, 2" MIN. BED OVER VAPOR
6. 6 MIL BLACK VISQUEEN BARRIER (FOR CRAWL SURFACE).
7. BACKFILL, SLOPE ALL FINISH GRADES AWAY FROM BUILDING WALLS AT A 2 % (MIN.)
8. REFER TO SOILS REPORT FOR RECOMMENDED BACK FILL AND SOIL COMPACTION.

SEWERAGE + DRAINAGE:
1. FOUNDATION DRAIN PER IBC 1805.4.2.
2. DRAINAGE DISCHARGE TO AN APPROVED DRAINAGE SYSTEM PER IBC 1805.4.3.

ROOF CONSTRUCTION NOTES

GENERAL:
1. APPROVED ROOFING MATERIAL
2. 30# FELT PAPER, COUNTER FLASHED
3. 1/2" CDX PLYWOOD SHEATHING OR PER ENGINEER'S SCHEDULE, USE SIMPSON PSCL (PANEL SHEATHING CLIPS) 1 PER BAY.
4. PRE-ENGINEERED TRUSSES
5. R-49 INSULATION, MINIMUM.
6. 2 LAYERS OF 5/8" TYPE X G.W.B. LID.
7. ONE COAT VAPOR BARRIER PRIMER.
8. FINISH PAINT - OWNER TO SPECIFY COLOR.
9. ROOF PITCH, AS SHOWN ON PLAN.
10. SIMPSON CLIPS AT EACH TRUSS/RAFTER TO PLATE CONNECTION.
11. TYPICAL SOFFIT OVERHANGS, AS SHOWN ON PLAN, USE VENTED BLOCKING PER TRUSS/RAFTER BAY.
12. ADEQUATE CONNECTION AND TRANSFER OF LOAD FROM ROOF SYSTEM TO BEARING WALLS REQUIRED.
13. DRAFT STOPS WHERE NECESSARY PER CODE.
14. ALL PERIMETER AND BEARING WALL HEADERS TO BE 4x10 DF#2, U.N.O.

TRUSSES:
1. TRUSSES TO BE ENGINEERED BY LICENSED TRUSS MANUFACTURER.
2. HANG TRUSSES AND RAFTERS WITH APPROVED SIMPSON HANGERS AS PER ENGINEERS SPECIFICATIONS.

FOR ADDITIONAL INFORMATION REFER TO 2015 IBC, SECTION 15, ROOF ASSEMBLIES & ROOFTOP STRUCTURES.

TYPICAL SHEET DISCLAIMER

REFER TO STRUCTURAL SHEETS (S) FOR SPECIFICATIONS & CALCULATIONS. USE ARCHITECTURAL SHEET FOR DIMENSIONAL INFORMATION ONLY.

STRUCTURAL FILL NOTES

STRUCTURAL FILL ADDED TO THIS SITE WHICH WILL SUPPORT BUILDING STRUCTURES SHALL BE APPROVED BY A GEO-TECHNICAL ENGINEER LICENSED TO WORK IN THE STATE OF WASHINGTON. A REPORT FROM SAID ENGINEER REGARDING THE SUITABILITY OF THE PREPARED SITE TO SUPPORT THE PROPOSED STRUCTURE SHALL BE SUBMITTED TO BUILDING SERVICES PRIOR TO ANY REQUESTS FOR FOUNDATION INSPECTION(S).

NOTES:
1. CONTRACTOR IS TO VERIFY STRUCTURAL INFORMATION, SPECIFICATIONS AND DETAILS WITH THE STRUCTURAL ENGINEER AND/OR ATTACHED STRUCTURAL SHEET(S). FAILURE TO VERIFY MAY RESULT IN CONFLICTING INFORMATION CONTAINED ON THE ARCHITECTURAL SHEETS. THE DESIGNER DOES NOT TAKE RESPONSIBILITY FOR STRUCTURAL COMPONENTS OR CALCULATIONS.
2. REFER TO STRUCTURAL SHEETS (S) FOR SPECIFICATIONS & CALCULATIONS.
3. A GEO ENGINEER IS REQUIRED TO BE ONSITE FOR PLACEMENT OF ALL STRUCTURAL FILL MATERIALS.

GENERAL NOTES:

1. ALL CONSTRUCTION SHALL COMPLY WITH THE 2018 INTERNATIONAL BUILDING CODE, WASHINGTON STATE REGULATIONS FOR BARRIER FREE DESIGN, WASHINGTON STATE ENERGY CODE, AND ALL APPLICABLE LOCAL CODES, ORDINANCES, AND STANDARDS.
2. CONTRACTOR IS TO VERIFY ALL EXISTING CONDITIONS, DIMENSIONAL DETAILS, ETC, AND NOTIFY THE ARCHITECT OF ANY AND ALL DISCREPANCIES PRIOR TO PROCEEDING WITH THE WORK.
3. ALL ITEMS MARKED "N.I.C.' ARE NOT PART OF THIS CONTACT.
4. ALL WORK SHALL BE APPLIED IN ACCORDANCE WITH THE MANUFACTURE'S LATEST RECOMMENDED OR WRITTEN DIRECTIONS.
5. DO NOT SCALE DRAWINGS, DIMENSIONS GOVERN. THE CONTRACTOR SHALL NOTIFY ARCHITECT IMMEDIATELY OF ANY AND ALL DISCREPANCIES.
6. ALL DIMENSIONS ARE TO FACE OF STUD OR CENTER LINE OF STUD, OR FACE OF FOUNDATION WALL UNLESS OTHERWISE NOTED.
7. WHERE CONSTRUCTION DETAILS ARE NOT SHOWN OR NOTED FOR ANY PART OF THE WORK, THE DETAILS SHALL BE THE SAME AS' FOR OTHER SIMILAR WORK.
8. WHERE DEVICES, OR ITEMS OR PARTS THEREOF ARE REFERRED TO IN SINGULAR, IT IS INTENDED THAT SUCH SHALL APPLY TO AS MANY SUCH DEVICES, ITEMS OR PARTS AS ARE REQUIRED TO PROPERLY COMPLETE THE WORK.
9. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO LOCATE ALL EXISTING UTILITIES WHETHER SHOWN HEREON OR NOT AND TO PROTECT THEM FROM DAMAGE.
10. THE CONTRACTOR WILL VERIFY AND CONFORM TO ALL REQUIREMENTS OF ALL UTILITY COMPANIES UNLESS OTHERWISE NOTED IN THE PLANS AND SPECIFICATIONS.
11. EXISTING ELEVATIONS AND LOCATIONS TO BE JOINED SHALL BE VERIFIED BY THE CONTRACTOR BEFORE CONSTRUCTION.
12. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO ENSURE THE SAFETY OF THE OCCUPANTS AND WORKERS AT ALL TIMES.
13. CONTRACTOR SHALL SECURE RELEVANT CITY AND STATE APPROVALS RELATING TO FIRE CONSTRUCTION, LABOR, HEALTH AND LICENSING.
14. CONTRACTOR SHALL SECURE AND PROVIDE ALL PERMITS FOR OCCUPANCY, UTILITIES AND ANY OTHERS REQUIRED BY GOVERNING AUTHORITIES BEYOND THE BASIC BUILDING PEN-NIT, MAKING TIMELY APPLICATIONS AND INQUIRES, PAYING ALL FEES AND POSTING ALL BONDS TO BE RELEASED AT FT COMPLETION OF CONSTRUCTION.
15. CONTRACTOR SHALL PROVIDE DRAWINGS, SHOP DRAWINGS AND CALCULATIONS AS REQUIRED FOR OWNER APPROVAL AND PERMITTING OF THE FIRE ALARM / MONITORING SYSTEM, AND ALL OTHER SYSTEMS REQUIRING BIDDER DESIGN. SUCH REVIEW AND APPROVAL SHALL BE BY THE OWNER. ALLOW A MINIMUM OF TWO WEEKS FOR REVIEW.
16. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE COMPLETE SECURITY OF THE BUILDING AND SITE WHILE JOB IS IN PROGRESS AND UNTIL THE JOB IS COMPLETED.
17. LATHING, PLASTER, AND GYPSUM WALL BOARD SYSTEMS SHALL CONFORM TO THE 2015 INTERNATIONAL BUILDING CODE.
18. ALL EXPOSED GYPSUM BOARD TO HAVE METAL EDGES AT ALL CORNERS AND WALL INTERSECTIONS,.
19. ALL GLASS AND GLAZING SHALL COMPLY WITH SECTION 24 OF THE 2015 IBC, AND THE U.S. PRODUCT SAFETY COMMISSION, SAFETY STANDARD FOR ARCHITECTURAL GLAZING MATERIALS (42 FR 1426; 16 CFR PART 1202)
20. THE CONTRACTOR SHALL VERIFY ALL DOOR AND WINDOW ROUGH OPENING DIMENSIONS WITH DOOR AND WINDOW MANUFACTURERS.
21. ALL REQUIRED FIRE DOORS SHALL BEAR A LABEL FROM A RECOGNIZED AGENCY SHOWING THE SPECIFIC RATING.
22. ELECTRICAL ROUGH-IN, AND REFLECTED CEILING PLAN ARE FOR THE GENERAL INFORMATION OF THE CONTRACTOR. EXACT LOCATIONS SHALL BE VERIFIED.
23. EXIT DOORS SHALL BE OPERABLE FROM THE INSIDE WITHOUT THE USE OF A KEY OR ANY SPECIAL KNOWLEDGE OR EFFORT.
24. PROVIDE PORTABLE FIRE EXTINGUISHER, EACH HAVING A MINIMUM UL CLASSIFICATION OF 2A:10B:C. EXTINGUISHER SHALL BE DISTRIBUTED THROUGHOUT PREMISES ON THE BASIS OF ONE EXTINGUISHER PER EACH 3,000 FEET OF FLOOR AREA. ALL EXTINGUISHERS SHALL BE HUNG IN CONSPICUOUS LOCATIONS SO THAT THEIR TOPS ARE NOT MORE THAN FIVE FEET A.F.F. WHERE EXTINGUISHERS ARE NOT VISIBLE IN ALL DIRECTIONS PROVIDE APPROVED INDICATING SIGNS.
25. SOUND INSULATE ALL PLUMBING WALLS AND LINES.
26. PROVIDE BLOCKING IN ALL WALLS TO SUPPORT CABINETRY, SHELVING, BATHROOM FIXTURES, DISPLAY RAILS AND ALL OTHER EQUIPMENT OR IMPROVEMENTS AS REQUIRED.
27. THE PREMISES ADDRESS SHALL BE PROMINENTLY DISPLAYED ON OR ADJACENT TO THE MAIN ENTRANCE. NUMBERS SHALL BE A MINIMUM 8 INCHES IN HEIGHT WITH A PRINCIPAL STROKE WIDTH OF 3/4" AND SHALL PROVIDE A POSITIVE CONTRAST WITH THEIR BACKGROUND.
28. APPROVED PLANS AND CALCULATIONS, SIGNED, SEALED AND DATED SHALL BE ON SITE AT ALL TIMES OF INSPECTION AND CONSTRUCTION.
29. AT ALL TUB/SHOWER LOCATIONS, WALL COVERINGS SHALL BE PLASTIC OR LAMINATE TO A MINIMUM 70 INCHES ABOVE DRAIN.
30. ALL SMOKE DETECTORS TO BE HARD WIRED WITH APPROVED BATTERY BACK-UP'S.ALL GAS APPLIANCES SHALL HAVE AN INTERMITTENT IGNITION DEVICE.
31. FLASH AND COUNTER FLASH ALL ROOF TO WALL CONNECTIONS. U.N.O.
32. WATERPROOF MATERIAL SHALL BE INSTALLED AROUND TUBS AND SHOWERS TO A MIN. HEIGHT OF SIX FEET ABOVE FINISH FLOOR.
33. DRYERS SHALL BE VENTED TO OUTSIDE. PER LOCAL CODE.

CONTRACTOR NOTES

1. CONTRACTOR IS TO VERIFY STRUCTURAL INFORMATION, SPECIFICATIONS AND DETAILS WITH THE STRUCTURAL ENGINEER AND/OR ATTACHED STRUCTURAL SHEET(S). FAILURE TO VERIFY MAY RESULT IN CONFLICTING INFORMATION CONTAINED ON THE ARCHITECTURAL SHEETS. THE DESIGNER DOES NOT TAKE RESPONSIBILITY FOR STRUCTURAL COMPONENTS OR CALCULATIONS.

CONCRETE NOTES

REFER TO STRUCTURAL ENGINEERS NOTES

FIRE CODE NOTES

1. VERIFY LOCATION OF 110v SMOKE ALARMS & CARBON MONOXIDE ALARMS WITH LOCAL FIRE DEPT. AND/OR LOCAL BUILDING DEPT. ALL SMOKE ALARMS WITHIN INDIVIDUAL UNITS WILL BE INTERCONNECTED.
2. BEFORE ANY COMBUSTIBLE CONSTRUCTION BEGINS AN APPROVED WATER SUPPLY SHALL BE AVAILABLE.
3. STAIRWELL STANDPIPES SHALL BE INSTALLED WHEN THE PROGRESS OF CONSTRUCTION IS NOT MORE THAN 40 FEET IN HEIGHT ABOVE THE LOWEST LEVEL OF FIRE DEPARTMENT ACCESS.
4. FIRE SAFETY DURING CONSTRUCTION SHALL BE PER IFC 2015, CHAPTER 33, ENTITLED "FIRE SAFETY DURING CONSTRUCTION AND DEMOLITION."

FIRE RATED PENETRATIONS

AS PER UL LISTED SYSTEM NO. F-C-2134, USE APPROVED 3M FIRE BARRIER CP 25WB+ CAULK OR FD 150+ CAULK FOR ALL THROUGH FLOOR-WALL-CEILING PENETRATIONS. NOT TO EXCEED 1/2" DIAMETER BEAD CONTINUOUSLY AROUND PIPE.

FIRE BLOCKING NOTES

718.1 General. Fireblocking and draftstopping shall be installed in combustible concealed locations in accordance with this section. Fireblocking shall comply with Section 718.2. Draftstopping in floor/ceiling spaces and attic spaces shall comply with Sections 718.3 and 718.4, respectively.
718.2 Fireblocking. In combustible construction, Fireblocking shall be installed to cut off concealed draft openings (both vertical and horizontal) and shall form an effective barrier between floors, between a top story and a roof or attic space. Fireblocking shall be installed in the locations specified in Sections 718.2.2 through 718.2.7.
718.2.2 Concealed wall spaces. Fireblocking shall be provided in concealed spaces of stud walls and partitions, including furred spaces, and parallel rows of studs or staggered studs, as follows:
1. Vertically at the ceiling and floor levels.
2. Horizontally at intervals not exceeding 10 feet (3048 mm).
718.2.5 Ceiling and floor openings. Where required by Section 712.1.7, Exception 1 of Section 714.4.1.2 or Section 714.4.2, fireblocking of the annular space around vents, pipes, ducts, chimneys and fireplaces at ceilings and floor levels shall be installed with a material specifically tested in the form and manner intended for use to demonstrate its ability to remain in place and resist the free passage of flame and the products of combustion.

* REFER TO IBC CODE TEXT FOR MORE DETAILED INFORMATION REGARDING FIREBLOCKING

DRAFTSTOP NOTES

718.3 Draftstopping in floors. In combustible construction, draftstopping shall be installed to subdivide floor/ceiling assemblies in the locations prescribed in Sections 718.3.2 through 718.3.3.
718.3.2 Groups R-1, R-2, R-3 and R-4. Draftstopping shall be provided in floor/ceiling spaces in Group R-1 buildings, in Group R-2 buildings with three or more dwelling units, in Group R-3 buildings with two dwelling units and in Group R-4 buildings. Draftstopping shall be located above and in line with the dwelling unit and sleeping unit separations.
Exceptions:
1. Draftstopping is not required in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.
2. Draftstopping is not required in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.2, provided that automatic sprinklers are also installed in the combustible concealed spaces where the draftstopping is being omitted.
718.4 Draftstopping in attics. In combustible construction, draftstopping shall be installed to subdivide attic spaces and concealed roof spaces in the locations prescribed in Sections 718.4.2 and
718.4.2 Groups R-1 and R-2. Draftstopping shall be provided in attics, mansards, overhangs or other concealed roof spaces of Group R-2 buildings with three or more dwelling units and in all Group R-1 buildings. Draftstopping shall be installed above, and in line with, sleeping unit and dwelling unit separation walls that do not extend to the underside of the roof sheathing above.
Exceptions:
1. Where corridor walls provide a sleeping unit or dwelling unit separation, draftstopping shall only be required above one of the corridor walls.
2. Draftstopping is not required in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.
3. In occupancies in Group R-2 that do not exceed four stories above grade plane, the attic space shall be subdivided by draftstops into areas not exceeding 3,000 square feet (279 m2) or above every two dwelling units, whichever is smaller.
4. Draftstopping is not required in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.2, provided that automatic sprinklers are also installed in the combustible concealed space where the draftstopping is being omitted.

* REFER TO IBC CODE TEXT FOR MORE DETAILED INFORMATION REGARDING FIREBLOCKING

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STATE OF WASHINGTON

Custom Design For: ABC RECYCLING
Building 3 Reclamation
741 Marine Dr
Bellingham WA 98226

Project number	TRC 22-001
Date	Oct 20 2023
Design	RKM
Drawn by:	RKM
Checked by:	RKM

Set Description:
Permit Set

General Notes

A1.1

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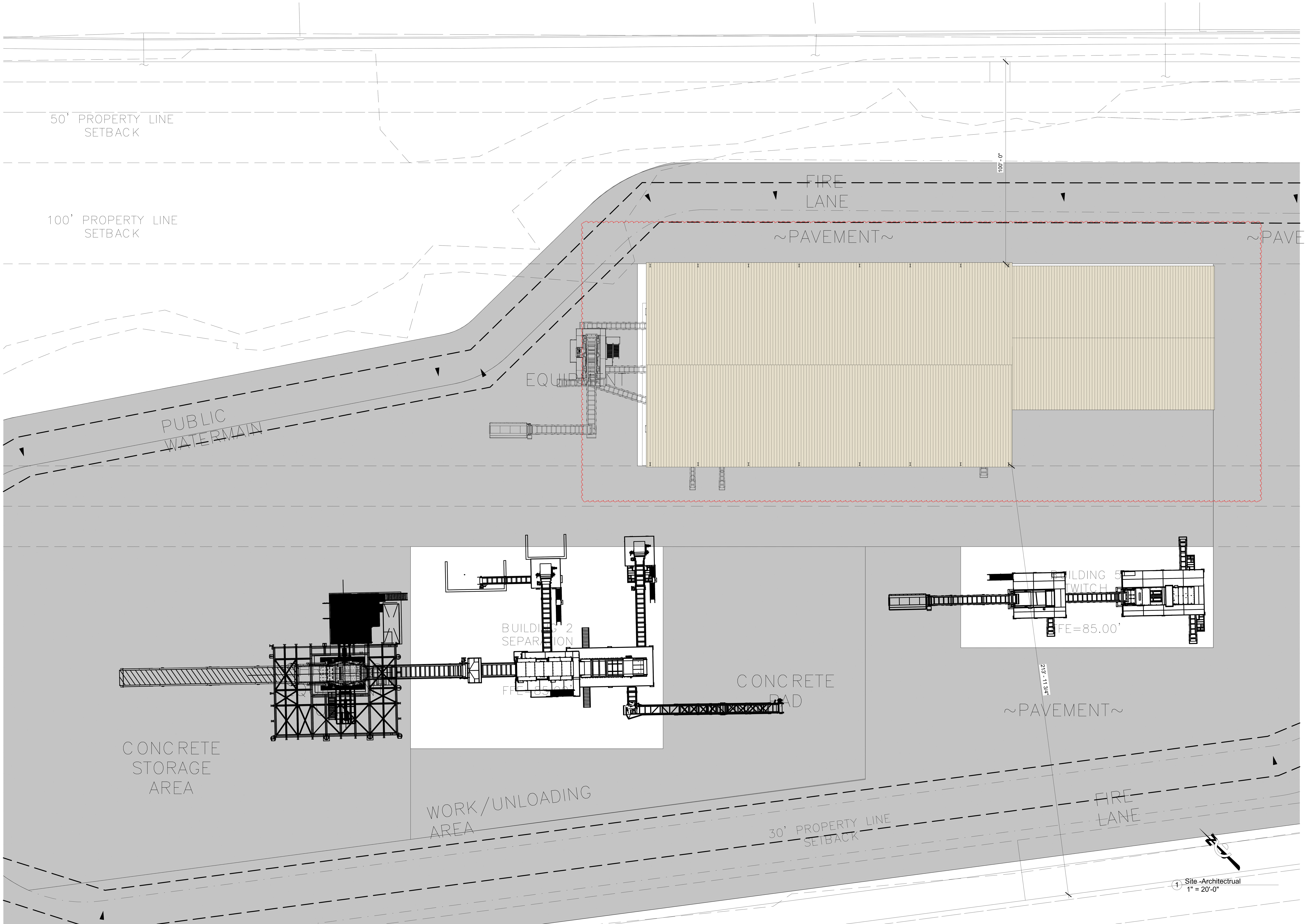

1 Site -Architectrual
1" = 20'-0"

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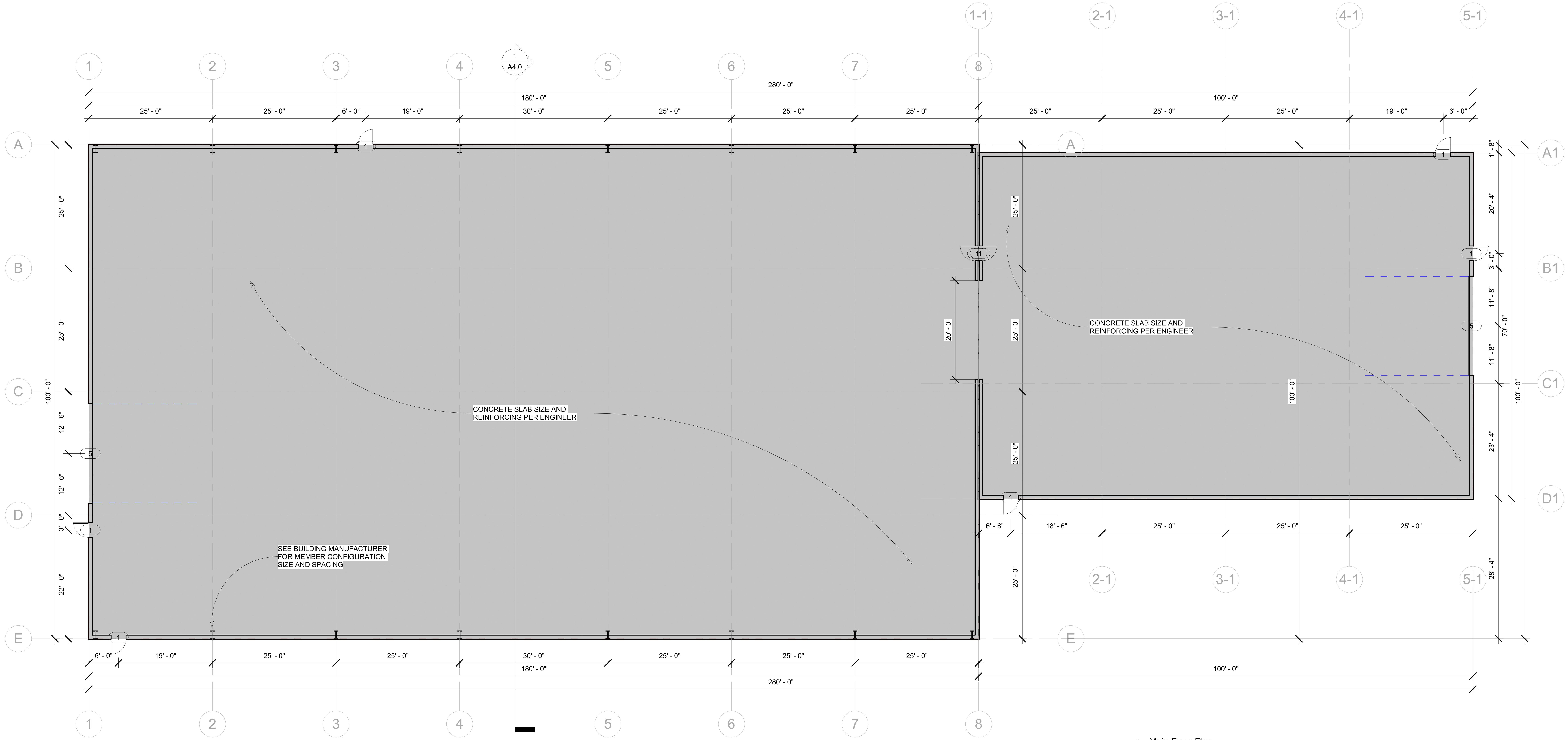
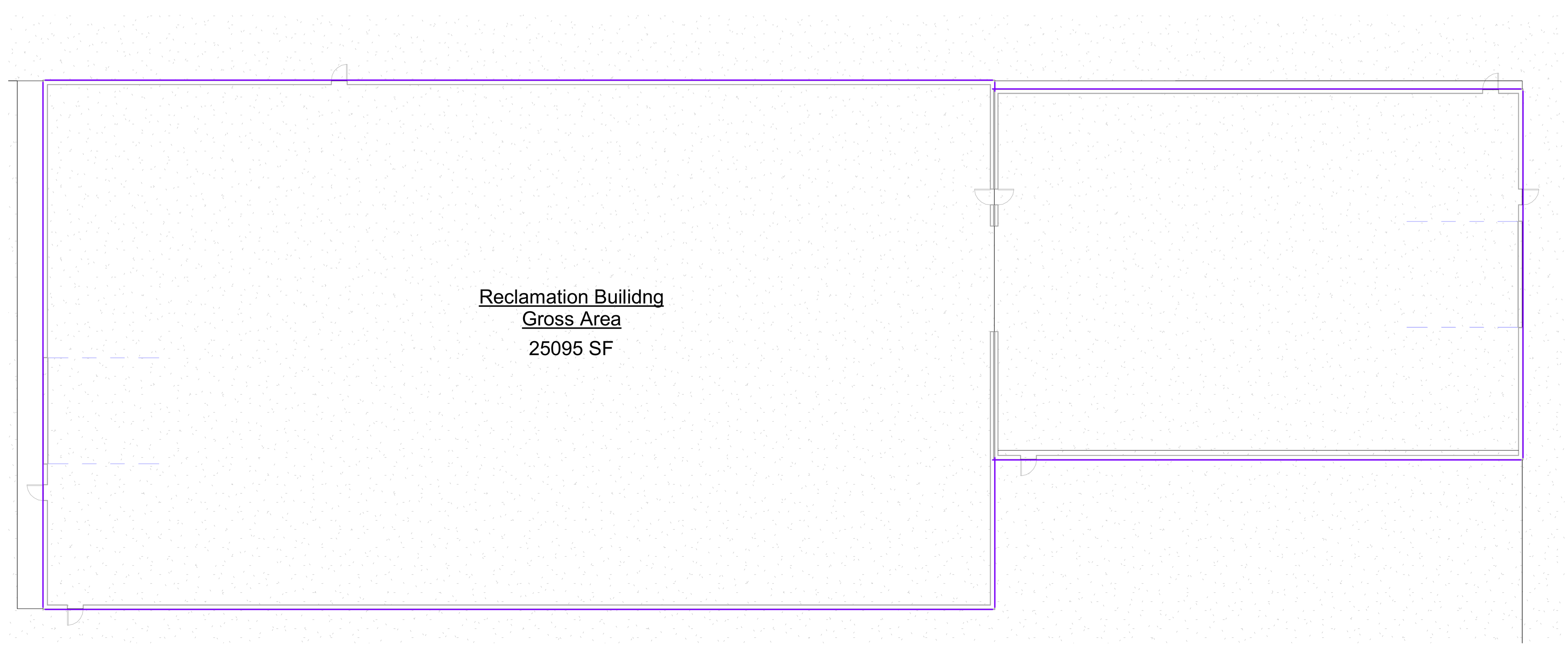
Site Plan

A1.3



1 Main Floor Plan
3/32" = 1'-0"



2 Main Floor
3/64" = 1'-0"

Door Schedule				
Door Type	Count	Function	Door Size	Type Comments
1	8	Exterior	3/0 7/0 Flush Steel	Insulated metal door and frame, key pad exterior lock, ADA lever latchas required
5	2	Exterior	20' x 20' Overhead	W/Locking Pull Chain

Grand total: 10

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Floor Plan

A2.0

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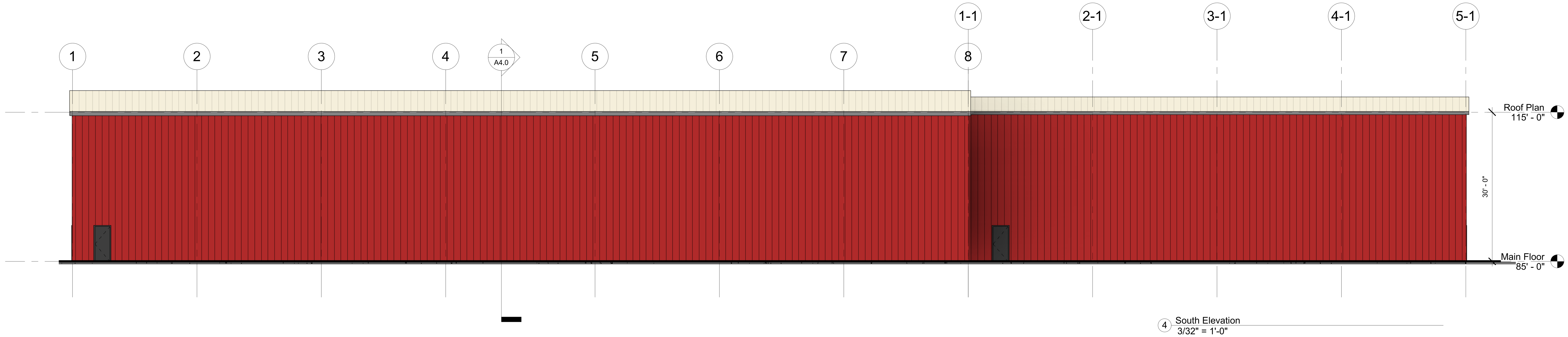
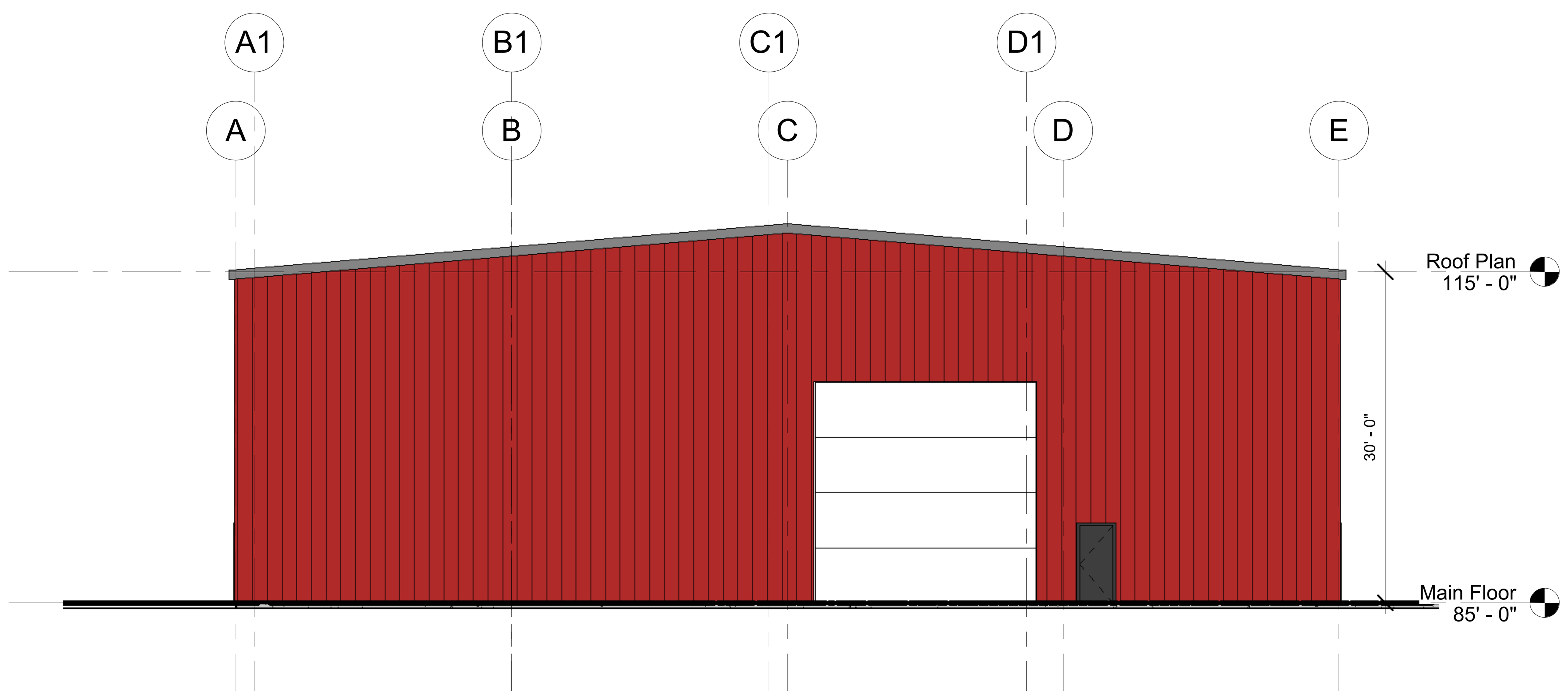
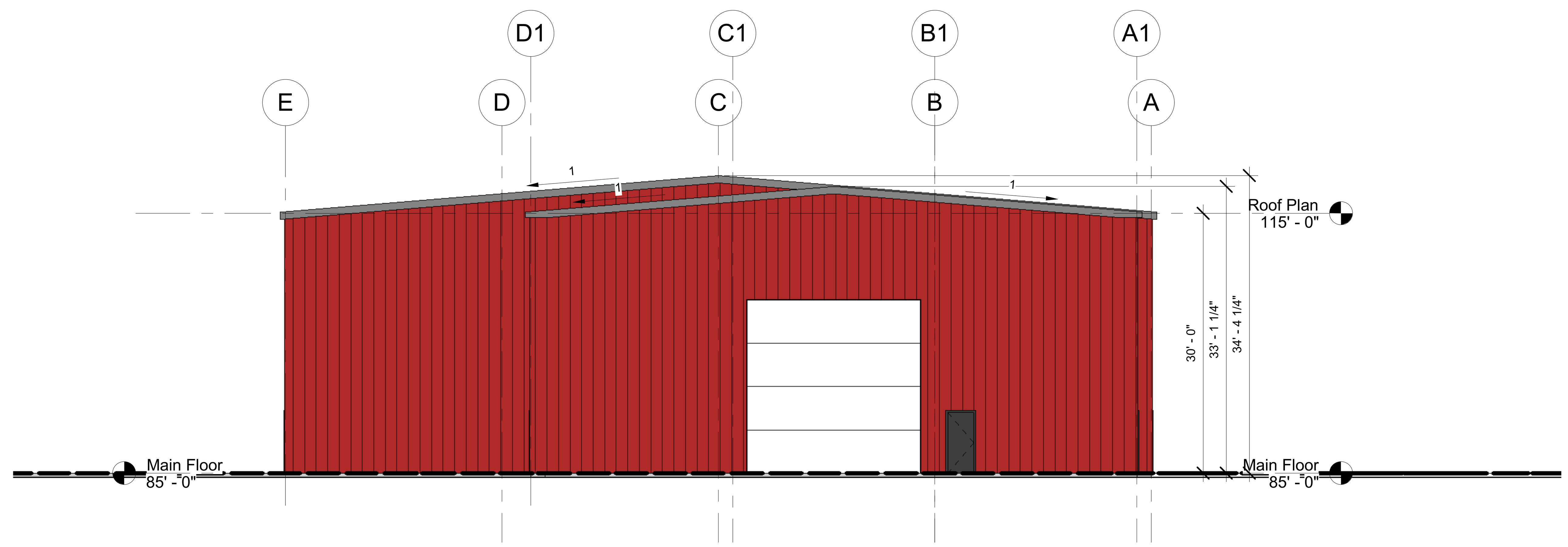


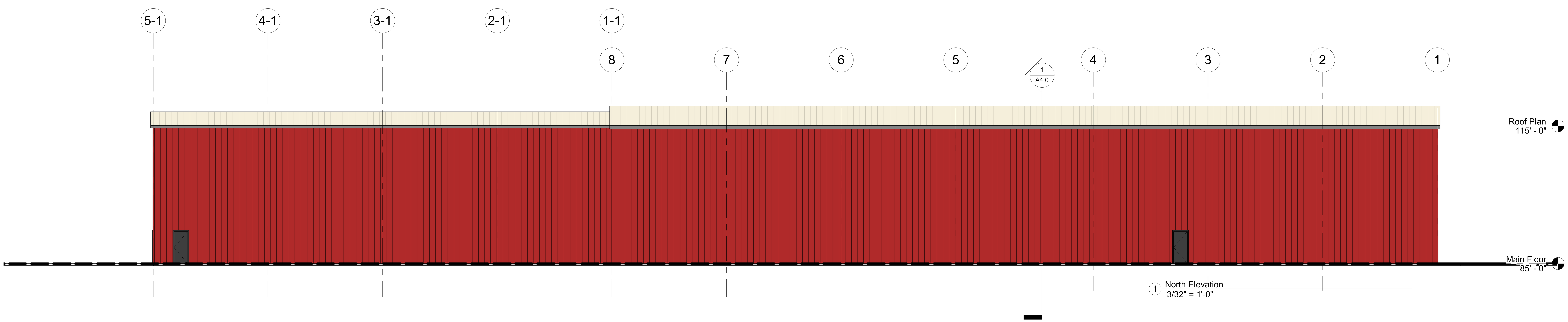
4 South Elevation
3/32" = 1'-0"



2 West Elevation
3/32" = 1'-0"



3 East Elevation
3/32" = 1'-0"



1 North Elevation
3/32" = 1'-0"

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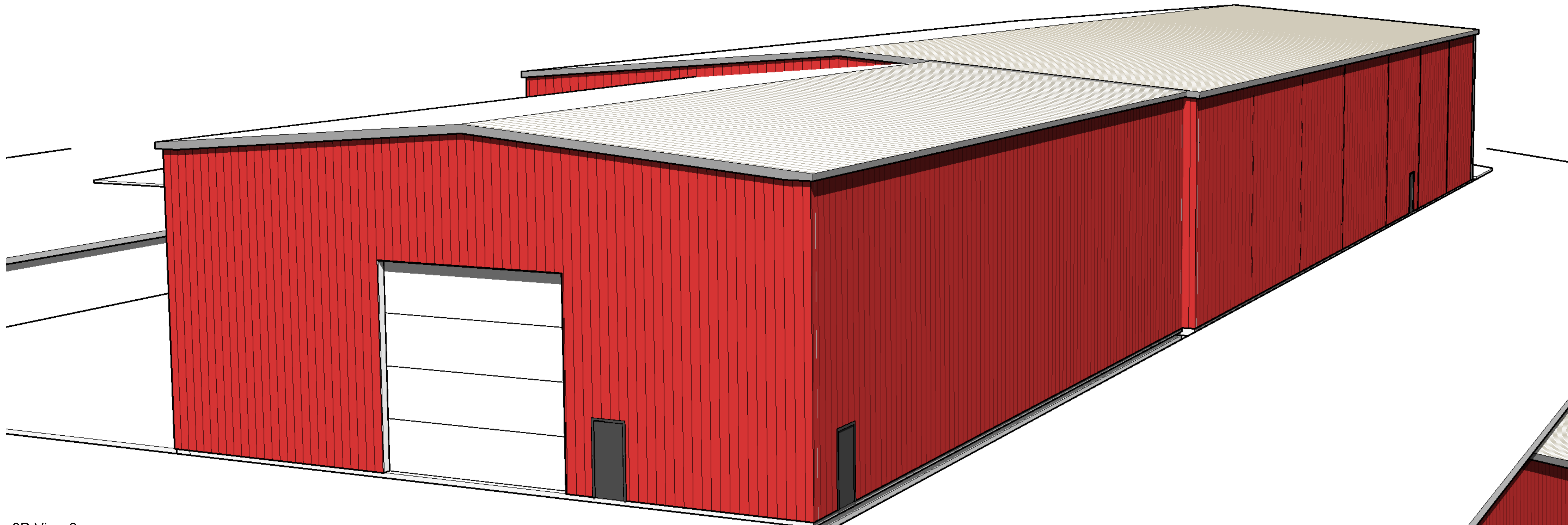
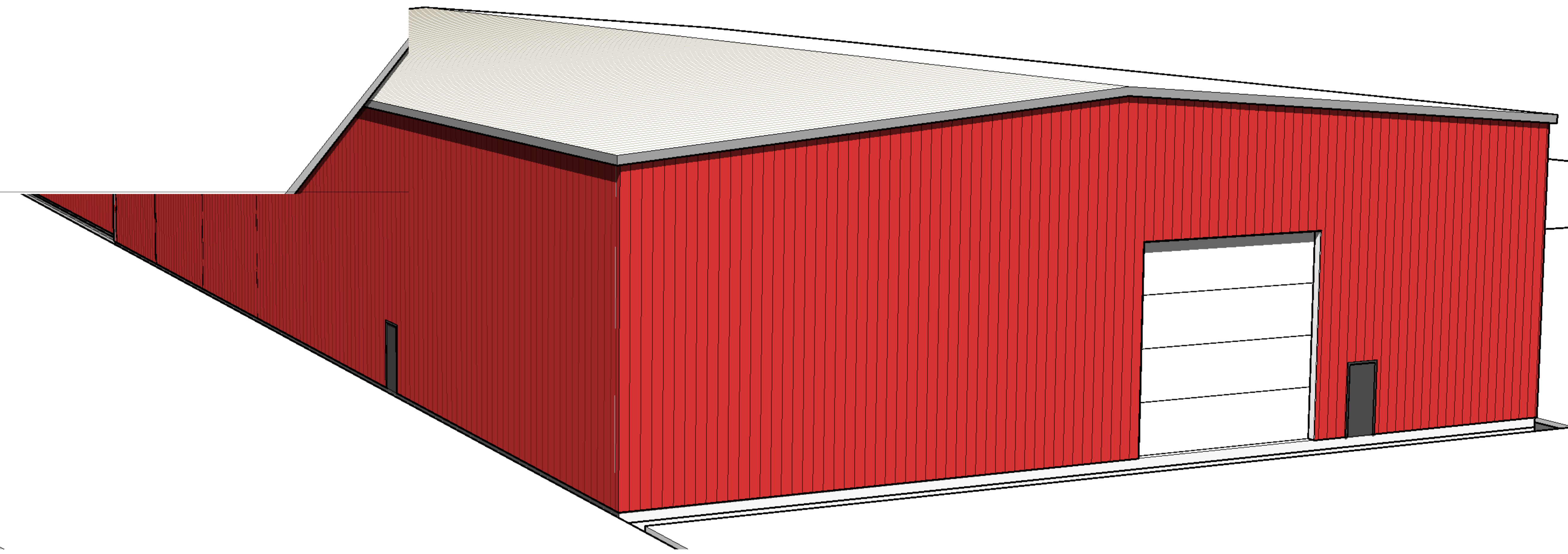
Elevations

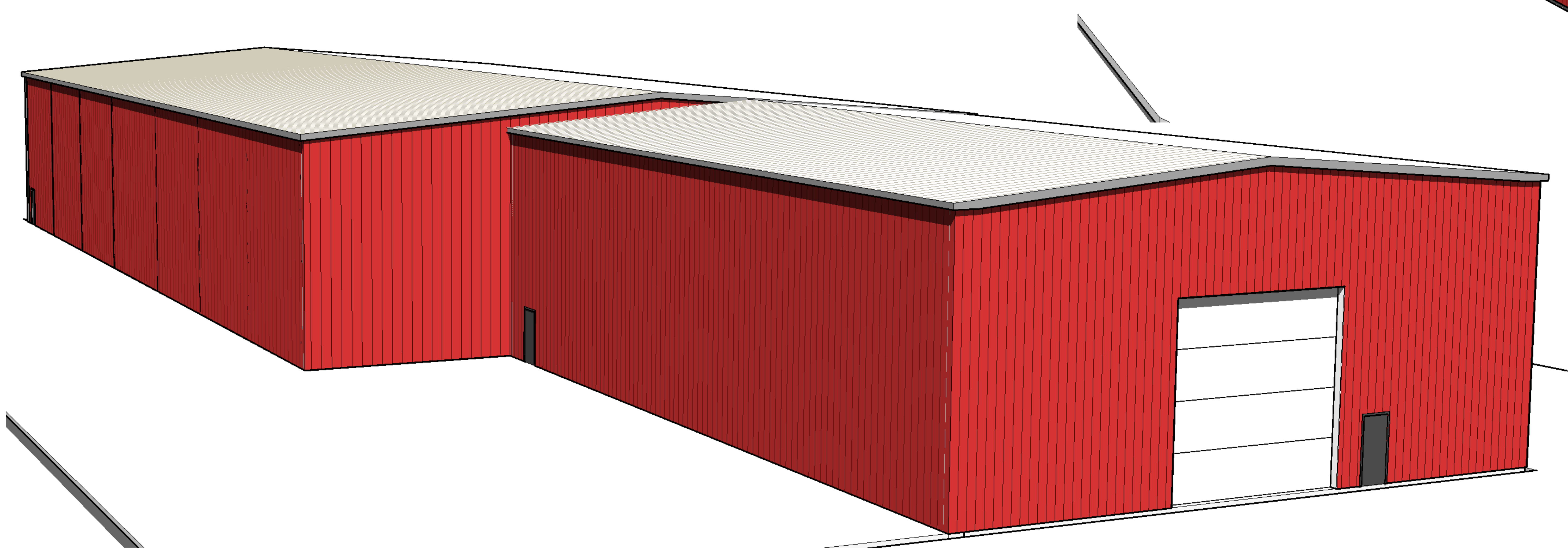
A3.0



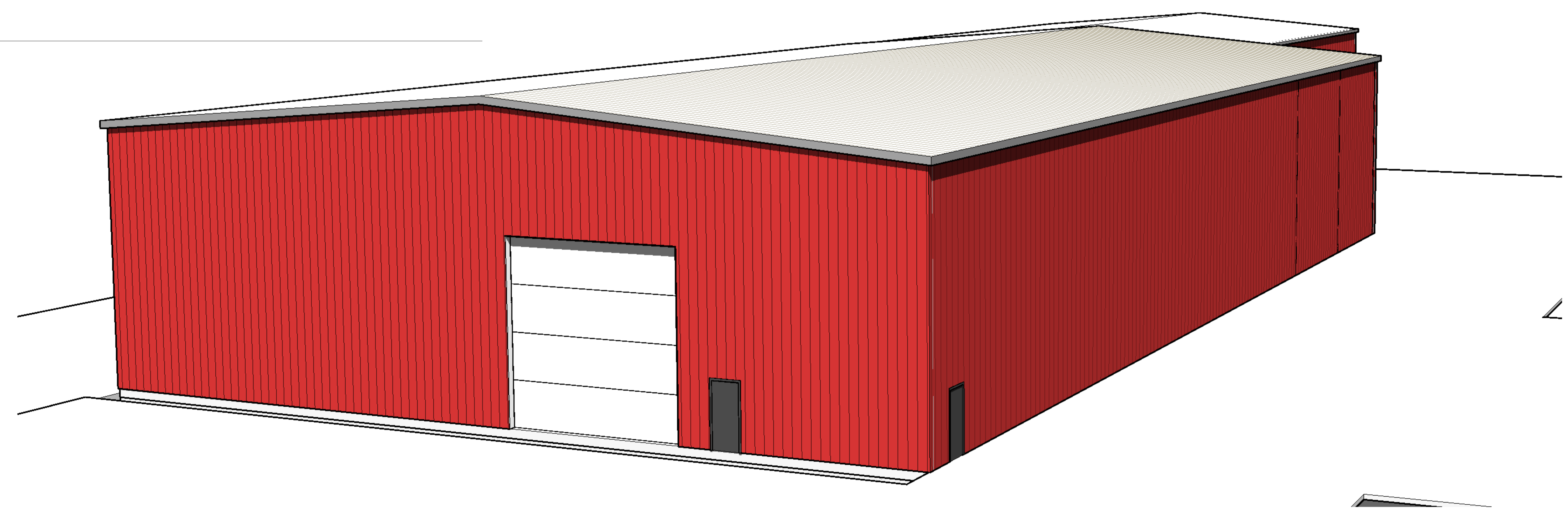
2 3D View 2



1 3D View 1



3 3D View 3



4 3D View 4

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Perspective Views

A3.2

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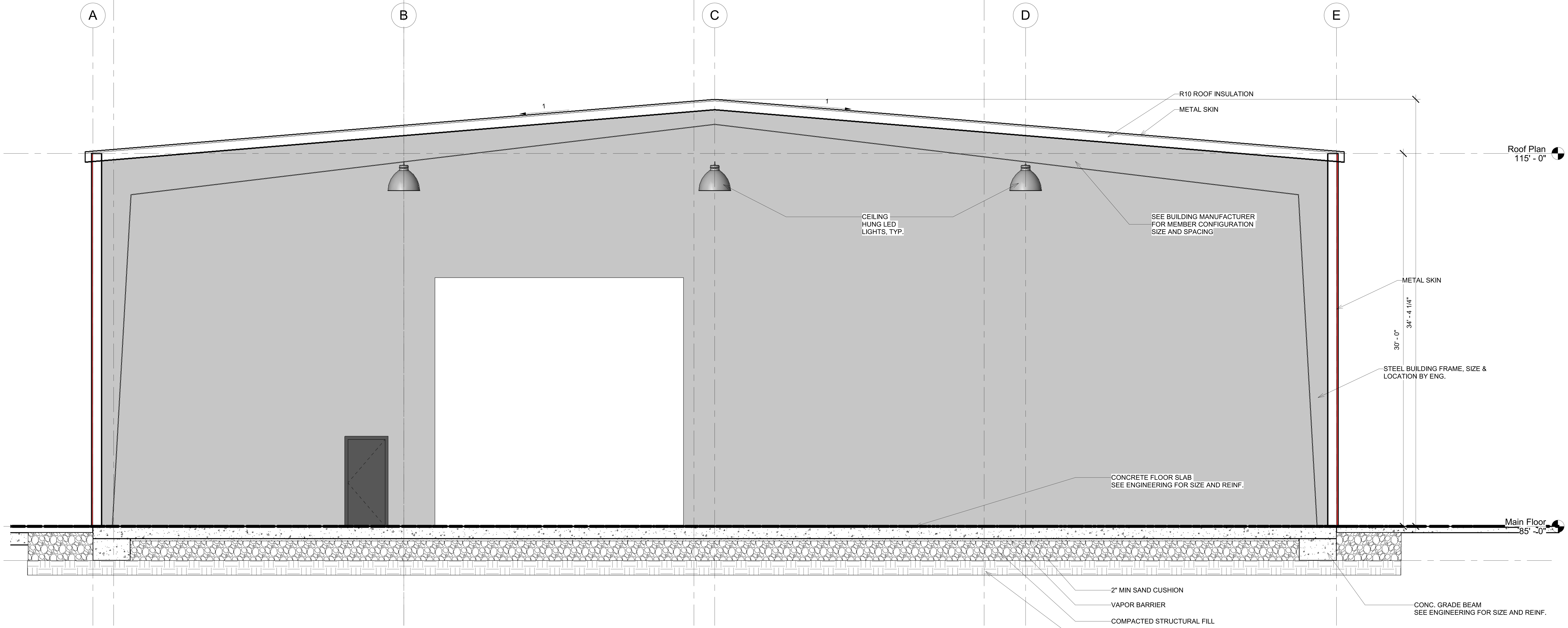
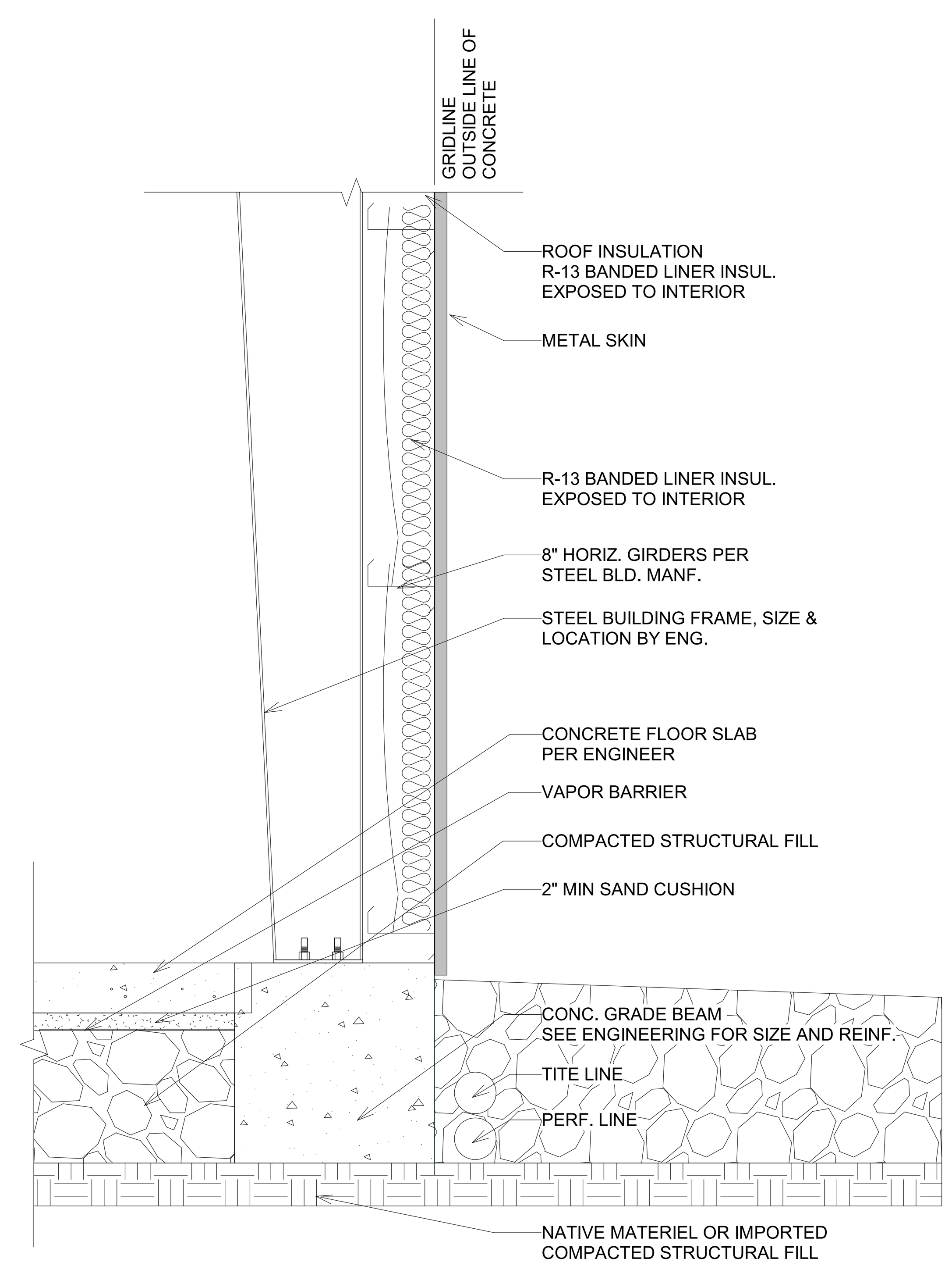


1 Section 1
1/4" = 1'-0"



3 Wall - Non Rated Exterior Main Frame
3/4" = 1'-0"

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Building Section

A4.0

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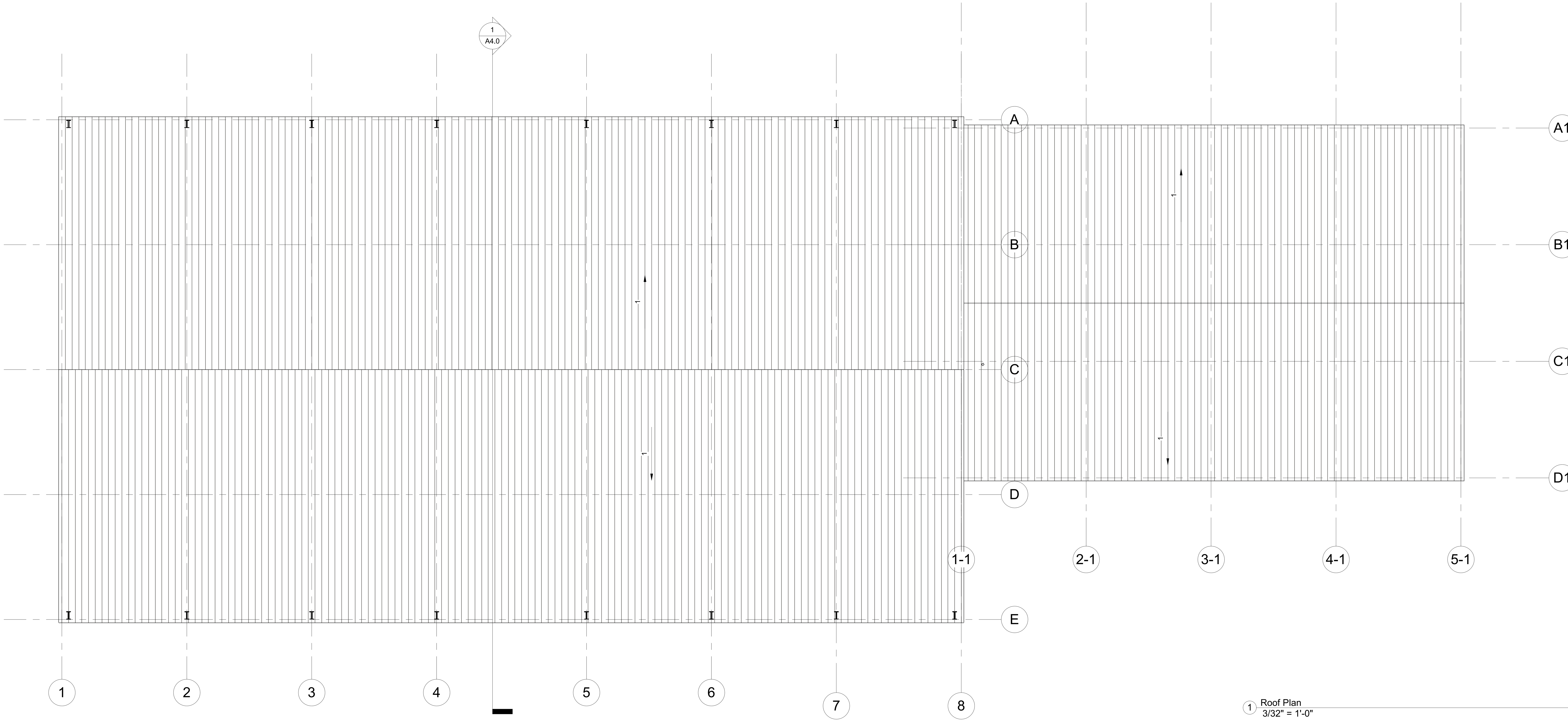
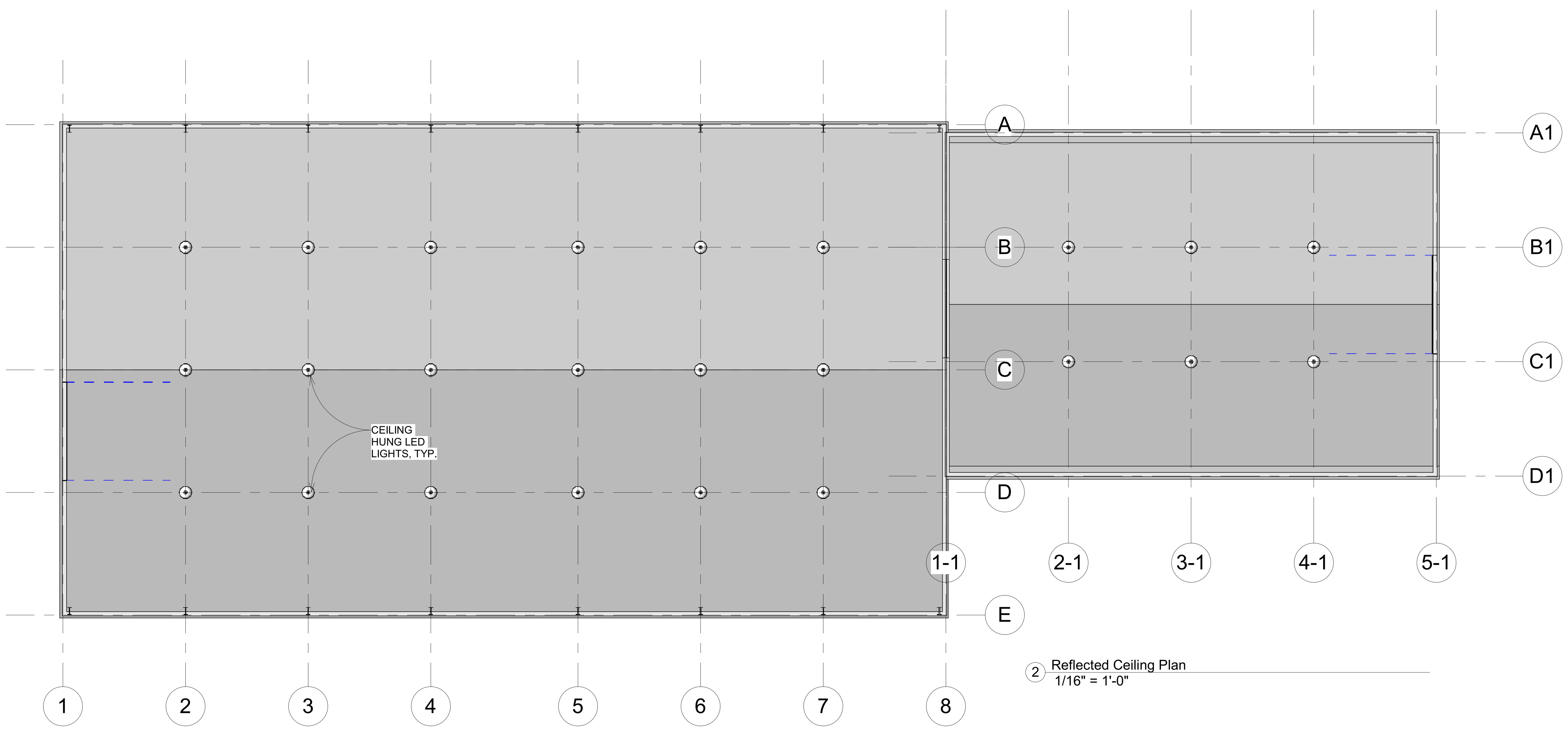


1 Roof Plan
3/32" = 1'-0"



2 Reflected Ceiling Plan
1/16" = 1'-0"

3 Lighting - High Bay LED
12" = 1'-0"

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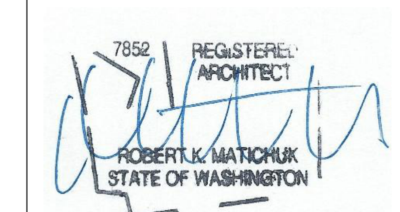

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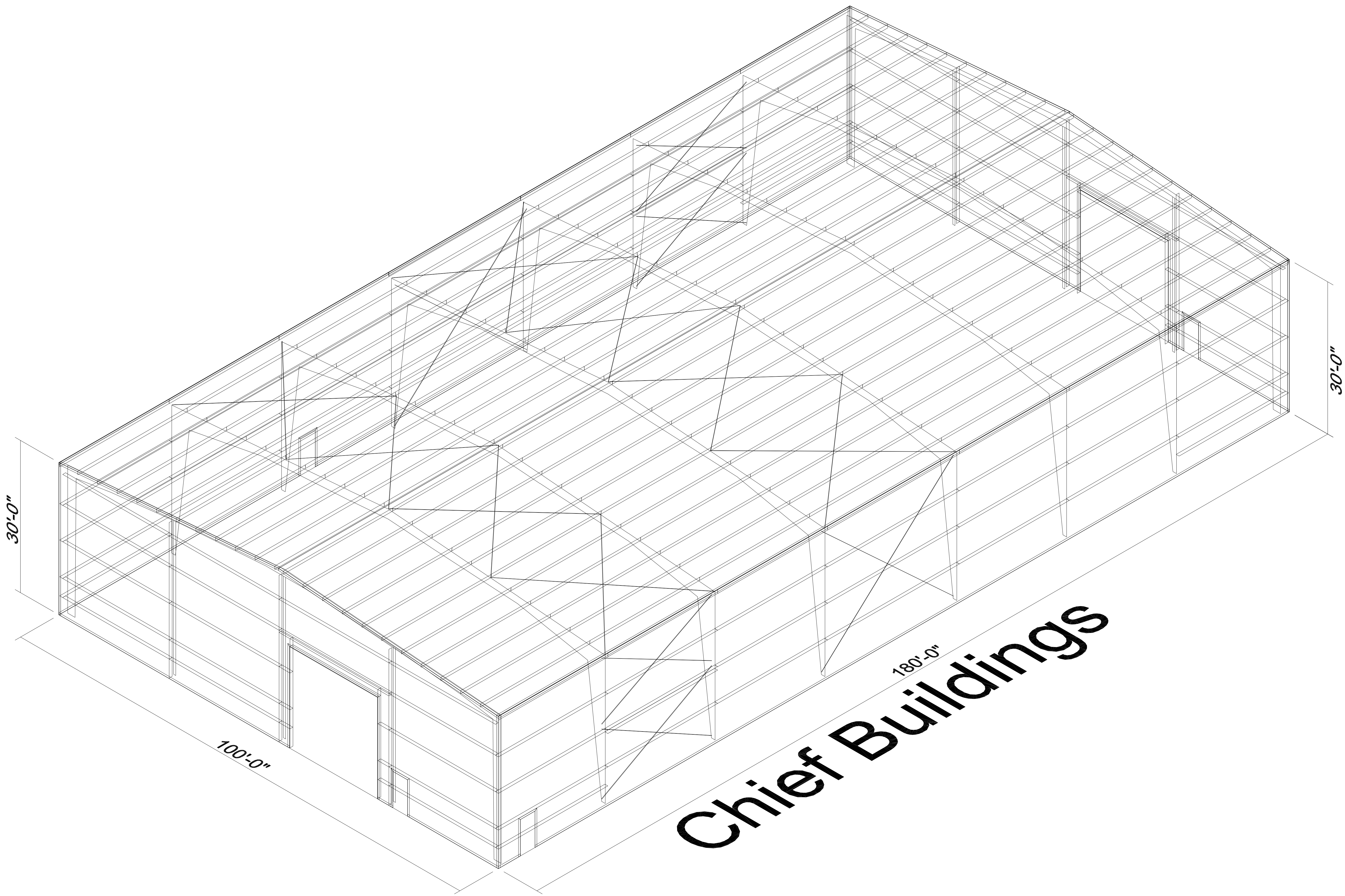
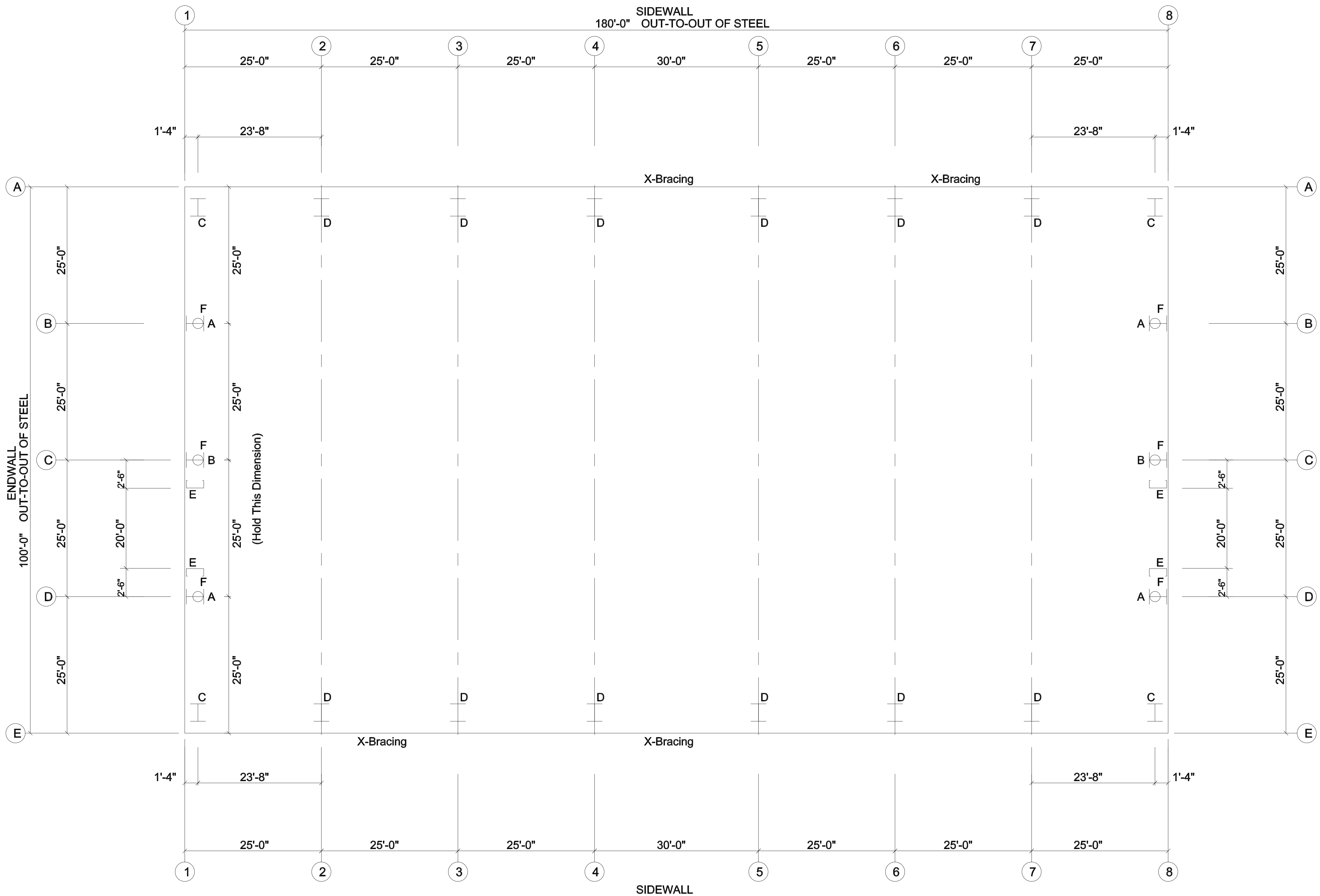
Roof & RCP Plan

A5.0


30'-0"
30'-0"
100'-0"
180'-0"
Chief Buildings



ANCHOR ROD PLAN

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

REFERENCE NOTES:

1. All Anchor Rods including nuts and washers for same are not furnished by CHIEF BUILDINGS.
2. Anchor Rod material shall conform to ASTM F1554 having a yield of 36 KSI or greater.
3. Rod projections are recommended minimums based on the base plate bearing directly on the concrete pier. If the base plate is to bear on grout, the rod projection must be increased accordingly.
4. Concrete shall have a minimum strength of 3000 PSI.
5. ALL DRAWINGS ARE NOT TO SCALE.
6. Anchor Rod Summary Table
   - Quantity includes all buildings, all phases.
   - However anchor rods for Partitions and Smart Canopies are found on separate pages (when applicable).

ANCHOR ROD SUMMARY

	Qty	Locate	Dia (in)	Type	Proj (in)
●	8	Jamb	1/2"	F1554	1.50
⊕	24	Endwall	3/4"	F1554	2.00
⊕	88	Frame	3/4"	F1554	2.00

PRELIMINARY

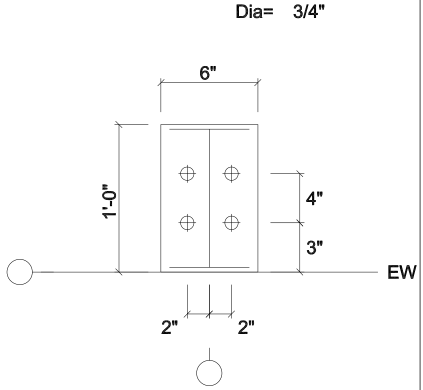
- Preliminary drawings for sales and estimating purposes only.
- Subject to change during order process.

NOT FOR CONSTRUCTION

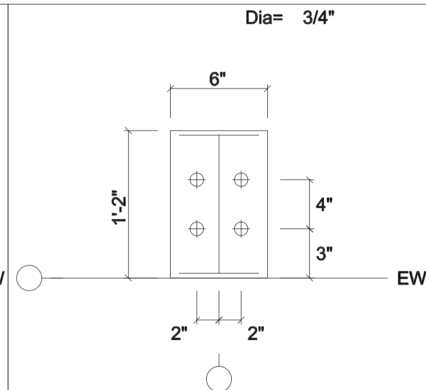
Drawing	ANCHOR ROD
Buyer	Steel Buildings Northwest, Inc
Customer	ABC Recycling Bellingham, WA 98225
Project Name	ABC Recycling - bldg 2

CHIEF BUILDINGS

DATE DRAWN	QUOTE NO.
8/25/23	FQ74601A



DETAIL A



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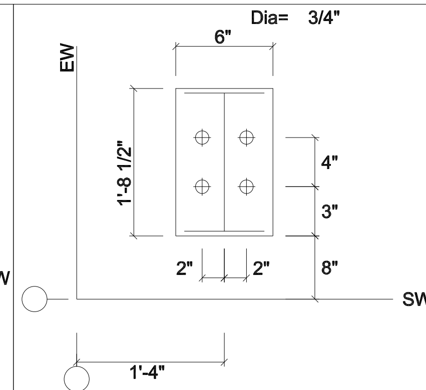

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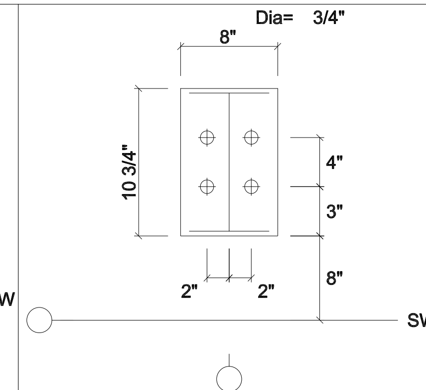

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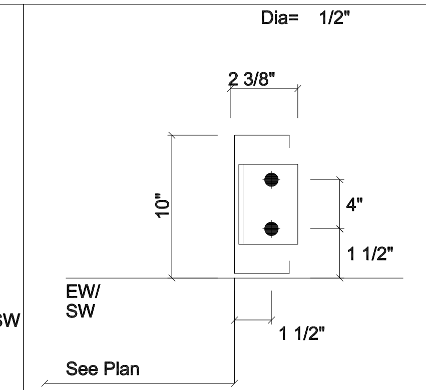
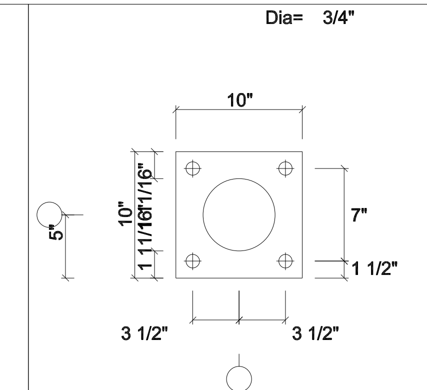


DETAIL E

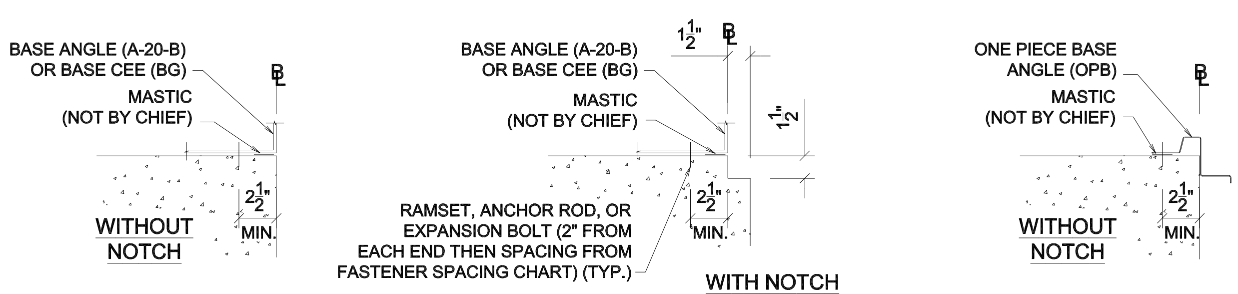


DETAIL F

BASE ANCHORAGE SPACING FOR STANDARD BASE ANGLE, BASE CEE OR ONE PIECE BASE WITH CS OR AP WALLS		
FASTENER TYPE & DIAMETER	MINIMUM EMBEDMENT	MAXIMUM SPACING
1/4" WEDGE ANCHOR (1)	1 1/4"	3'-0"
1/4" SCREW TYPE ANCHOR (2)	1 1/2"	3'-0"
3/8" CAST-IN ANCHOR	4" WITH HOOK OR HEAD	3'-0"
1/4" HAMMER-IN (3)	1 3/8"	2'-0"
0.14 POWDER ACTUATED (4)	1 1/4"	1'-6"

1. HILTI KWIK BOLT®, RAMSET TRUBOLT®, POWERS POWERSTUD®, OR EQUAL
2. CFS TAPCON®, HILTI KWIK-CON II®, POWERS WEDGE-BOLT®, OR EQUAL
3. POWERS ZAMAC HAMMER SCREW®, HILTI METAL HIT ANCHOR®, OR EQUAL
4. POWERS BALLISTIC POINT PIN, RAMSET 1500/1600 SERIES, HILTI UNIVERSAL NAIL OR EQUAL

FASTENER SPACING CHART



BASE MEMBER DETAILS

CONTRACTOR IS RESPONSIBLE
FOR ANCHORING BASE MEMBER
TO CONCRETE.

REFERENCE NOTES:

1. ACTUAL BASE PLATE DIMENSIONS MAY BE SMALLER THAN BASE PLATE DIMENSIONS SHOWN.

PRELIMINARY

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NOT FOR CONSTRUCTION

Drawing	ANCHOR ROD
Buyer	Steel Buildings Northwest, Inc
Customer	ABC Recycling Bellingham, WA 98225
Project Name	ABC Recycling - bldg 2

CHIEF BUILDINGS	DATE DRAWN	QUOTE NO.
	8/25/23	FQ74601A

BUILDING BRACING REACTIONS

Wall Loc	Wall Line	Col Line	± Reactions(k) Wind Horz	Wind Vert	Seismic Horz	Seismic Vert	Panel_Shear (lb/ft) Wind	Seis	Note
L_EW	1								(h)
F_SW	E	2,3	8.5	9.5	7.5	8.5			
		4,5	8.5	8.0	7.5	7.0			
R_EW	8								(h)
B_SW	A	7,6	8.5	9.5	7.5	8.5			
		5,4	8.5	8.0	7.5	7.0			

(h)Rigid frame at endwall

Reactions for seismic represent shear force, Eh

RIGID FRAME: BASIC COLUMN REACTIONS (k)

Frame Line	Column Line	-----Dead---- Horiz	Vert	--Collateral- Horiz	Vert	-----Live---- Horiz	Vert	-----Snow---- Horiz	Vert	--Wind_Left1- Horiz	Vert	-Wind_Right1- Horiz	Vert
1*	A	0.1	1.2	0.1	0.5	0.2	2.1	0.3	3.0	-5.3	-9.4	5.2	-0.2
1*	E	-0.1	1.2	-0.1	0.5	-0.2	2.1	-0.3	3.0	-5.2	-0.2	5.3	-9.4
1*	B	0.0	1.5	0.0	0.9	0.0	3.7	0.0	5.4	0.0	-7.1	0.0	-9.5
1*	C	0.0	1.7	0.0	1.1	0.0	4.2	0.0	6.2	0.0	-9.3	0.0	-9.3
1*	D	0.0	1.5	0.0	0.9	0.0	3.7	0.0	5.4	0.0	-9.5	0.0	-7.1

Frame Line	Column Line	--Wind_Left2- Horiz	Vert	-Wind_Right2- Horiz	Vert	--Wind_Long1- Horiz	Vert	--Wind_Long2- Horiz	Vert	-Seismic_Left Horiz	Vert	Seismic_Right Horiz	Vert
1*	A	-6.8	-7.1	3.7	2.1	2.8	-4.6	2.3	-4.1	-0.9	-1.3	0.9	1.3
1*	E	-3.7	2.1	6.8	-7.1	-2.3	-4.1	-2.8	-4.6	-0.9	1.3	0.9	-1.3
1*	B	0.0	-4.4	0.0	-6.7	0.0	-7.6	0.0	-3.3	0.0	1.5	0.0	-1.5
1*	C	0.0	-6.0	0.0	-6.0	0.0	-6.6	0.0	-6.6	0.0	0.0	0.0	0.0
1*	D	0.0	-6.7	0.0	-4.4	0.0	-3.3	0.0	-7.6	0.0	-1.5	0.0	1.5

Frame Line	Column Line	-MIN_SNOW-- Horiz	Vert	F1PAT_LL_1- Horiz	Vert	F1PAT_LL_2- Horiz	Vert	F1PAT_LL_3- Horiz	Vert	F1PAT_LL_4- Horiz	Vert	F1PAT_LL_5- Horiz	Vert
1*	A	0.3	3.4	0.1	1.9	-0.1	-0.2	0.1	0.2	0.1	2.1	0.1	-0.1
1*	E	-0.3	3.4	-0.1	0.2	0.1	-0.2	-0.1	1.9	-0.1	-0.1	-0.1	2.1
1*	B	0.0	6.2	0.0	4.2	0.0	1.8	0.0	-0.5	0.0	1.7	0.0	2.0
1*	C	0.0	7.1	0.0	2.1	0.0	4.7	0.0	2.1	0.0	2.1	0.0	2.1
1*	D	0.0	6.2	0.0	-0.5	0.0	1.8	0.0	4.2	0.0	2.0	0.0	1.7

Frame Line	Column Line	F1UNB_SL_L- Horiz	Vert	F1UNB_SL_R- Horiz	Vert
1*	A	0.2	2.6	0.2	1.1
1*	E	-0.2	1.1	-0.2	2.6
1*	B	0.0	7.5	0.0	0.8
1*	C	0.0	6.3	0.0	6.3
1*	D	0.0	0.8	0.0	7.5

Frame Line	Column Line	-----Dead---- Horiz	Vert	--Collateral- Horiz	Vert	-----Live---- Horiz	Vert	-----Snow---- Horiz	Vert	--Wind_Left1- Horiz	Vert	-Wind_Right1- Horiz	Vert
2*	A	2.7	5.9	2.1	3.8	8.4	15.0	12.3	21.9	-19.4	-29.6	-5.8	-20.0
2*	E	-2.7	5.9	-2.1	3.8	-8.4	15.0	-12.3	21.9	5.8	-20.0	19.4	-29.6

Frame Line	Column Line	--Wind_Left2- Horiz	Vert	-Wind_Right2- Horiz	Vert	--Wind_Long1- Horiz	Vert	--Wind_Long2- Horiz	Vert	-Seismic_Left Horiz	Vert	Seismic_Right Horiz	Vert
2*	A	-16.1	-17.0	-2.5	-7.4	-6.9	-37.0	-7.8	-31.8	-1.8	-1.0	1.8	1.0
2*	E	2.5	-7.4	16.1	-17.0	7.8	-31.8	6.9	-37.0	-1.8	1.0	1.8	-1.0

Frame Line	Column Line	-Seismic_Long Horiz	Vert	-MIN_SNOW-- Horiz	Vert	F2UNB_SL_L- Horiz	Vert	F2UNB_SL_R- Horiz	Vert
2*	A	0.0	-8.5	14.1	25.0	10.6	22.0	10.6	12.8
2*	E	0.0	-8.5	-14.1	25.0	-10.6	12.8	-10.6	22.0

Frame Line	Column Line	-----Dead---- Horiz	Vert	--Collateral- Horiz	Vert	-----Live---- Horiz	Vert	-----Snow---- Horiz	Vert	--Wind_Left1- Horiz	Vert	-Wind_Right1- Horiz	Vert
4*	A	2.8	6.2	2.3	4.1	9.0	16.5	13.2	24.1	-20.9	-32.6	-6.0	-22.0
4*	E	-2.8	6.2	-2.3	4.1	-9.0	16.5	-13.2	24.1	6.0	-22.0	20.9	-32.6

Frame Line	Column Line	--Wind_Left2- Horiz	Vert	-Wind_Right2- Horiz	Vert	--Wind_Long1- Horiz	Vert	--Wind_Long2- Horiz	Vert	-Seismic_Left Horiz	Vert	Seismic_Right Horiz	Vert
4*	A	-17.5	-18.7	-2.5	-8.2	-7.2	-38.1	-8.3	-32.5	-2.0	-1.1	2.0	1.1
4*	E	2.5	-8.2	17.5	-18.7	8.3	-32.5	7.2	-38.1	-2.0	1.1	2.0	-1.1

Frame Line	Column Line	-Seismic_Long Horiz	Vert	-MIN_SNOW-- Horiz	Vert	F3UNB_SL_L- Horiz	Vert	F3UNB_SL_R- Horiz	Vert
4*	A	0.0	-7.1	15.1	27.5	11.3	24.2	11.3	14.1
4*	E	0.0	-7.1	-15.1	27.5	-11.3	14.1	-11.3	24.2

1* Frame lines: 1 8
2* Frame lines: 2 3 6 7
4* Frame lines: 4 5

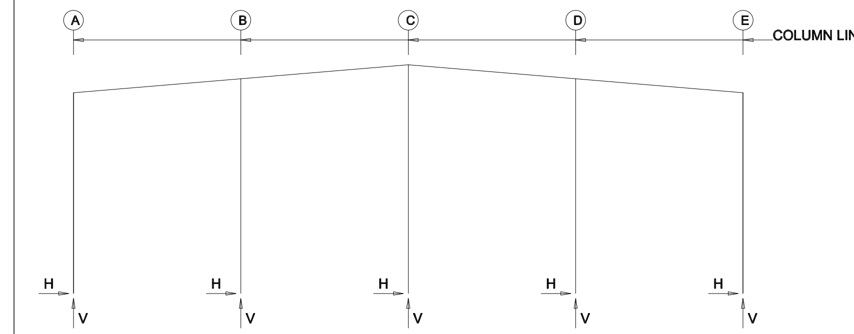
ENDWALL COLUMN: BASIC COLUMN REACTIONS (k)

Frm Line	Col Line	Dead Vert	Wind Press Horz	Wind Suct Horz	Seis Long Horz
1	B	0.5	-9.5	10.5	0.2
1	C	0.5	-10.1	11.2	0.2
1	D	0.5	-9.5	10.5	0.2
8	D	0.5	-9.5	10.5	0.2
8	C	0.5	-10.1	11.2	0.2
8	B	0.5	-9.5	10.5	0.2

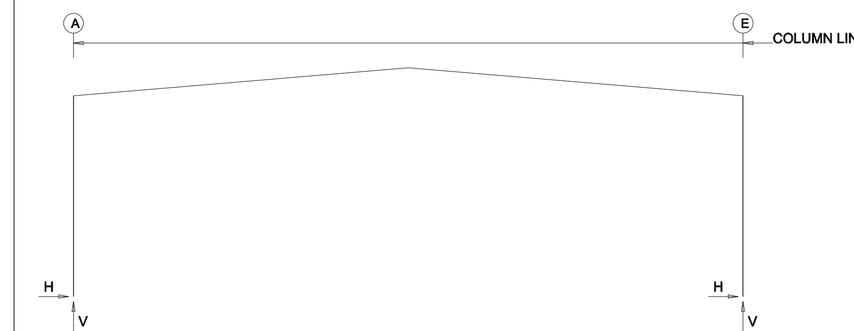
ENDWALL COLUMN: MAXIMUM REACTIONS

Frm Line	Col Line	Column_Reactions(k) Load Id	Hmax H	V Vmax	Load Id	Hmin H	V Vmin
1	B	12	6.3	0.3	13	-5.7	0.3
		9	0.0	0.5			
1	C	12	6.7	0.3	13	-6.1	0.3
		9	0.0	0.6			
1	D	12	6.3	0.3	13	-5.7	0.3
		9	0.0	0.5			
8	D	12	6.3	0.3	13	-5.7	0.3
		9	0.0	0.5			
8	C	12	6.7	0.3	13	-6.1	0.3
		9	0.0	0.6			
8	B	12	6.3	0.3	13	-5.7	0.3
		9	0.0	0.5			

FRAME LINES: 1 8



FRAME LINES: 2 3 4 5 6 7



RIGID FRAME: MAXIMUM REACTIONS

Frm Line	Col Line	Column_Reactions(k) Load Id	Hmax H	V Vmax	Load Id	Hmin H	V Vmin
1*	A	2	3.2	1.1	5	-4.0	-3.6
		10	0.4	5.2	3	-3.1	-4.9
1*	E	6	4.0	-3.6	1	-3.2	1.1
		10	-0.4	5.2	4	3.1	-4.9
1*	B	4	0.0	-4.8	4	0.0	-4.8
		11	0.0	10.0			
1*	C	4	0.0	-4.6	4	0.0	-4.6
		11	0.0	9.9			
1*	D	3	0.0	-4.8	3	0.0	-4.8
		11	0.0	10.0			

1* Frame lines: 1 8

RIGID FRAME: MAXIMUM REACTIONS

Frm Line	Col Line	Column_Reactions(k) Load Id	Hmax H	V Vmax	Load Id	Hmin H	V Vmin
2*	A	10	18.9	34.7	3	-10.0	-14.2
					7	-2.5	-18.6
2*	E	4	10.0	-14.2	10	-18.9	34.7
		10	-18.9	34.7	8	2.5	-18.6

2* Frame lines: 2 3 6 7

RIGID FRAME: MAXIMUM REACTIONS

Frm Line	Col Line	Column_Reactions(k) Load Id	Hmax H	V Vmax	Load Id	Hmin H	V Vmin
4*	A	10	20.1	37.8	3	-10.9	-15.8
					7	-2.6	-19.1
4*	E	4	10.9	-15.8	10	-20.1	37.8
		10	-20.1	37.8	8	2.6	-19.1

4* Frame lines: 4 5

CONTROLLING LOAD CASES

1 Dead+0.6Wind_Left1
2 Dead+0.6Wind_Right1
3 0.6Dead+0.6Wind_Left1
4 0.6Dead+0.6Wind_Right1
5 0.6Dead+0.6Wind_Left2
6 0.6Dead+0.6Wind_Right2
7 0.6Dead+0.6Wind_Long1L
8 0.6Dead+0.6Wind_Long2L
9 1.07Dead+1.07Collateral+0.7Seismic_Right
10 Dead+Collateral+MIN_SNOW
11 Dead+Collateral
12 0.6Dead+0.6Wind_Right2+0.6Wind_Suction
13 0.6Dead+0.6Wind_Pressure+0.6Wind_Long2L

1. COLUMN FOOTINGS AND PIERS MUST BE DESIGNED TO WITHSTAND HORIZONTAL AND VERTICAL REACTIONS AS SHOWN ON THE ANCHOR ROD PLAN. CHIEF BUILDINGS IS NOT RESPONSIBLE FOR DESIGN OF CONCRETE FOUNDATION. CHIEF BUILDINGS RECOMMENDS THAT THE SERVICES OF A QUALIFIED ENGINEER IS OBTAINED BY THE CONTRACTOR / BUILDER TO DESIGN THE FOUNDATIONS FOR THE INDICATED REACTIONS.

2. REACTIONS ARE GIVEN IN KIPS. (1 KIP = 1000 LBS.) MOMENTS, IF ANY, ARE GIVEN IN KIP-FT.

3. ANCHOR ROD DESIGN IS BASED ON SHEAR, TENSION, AND COMBINED TENSION AND SHEAR. CHIEF BUILDINGS IS NOT RESPONSIBLE FOR ANCHOR ROD SIZE RECOMMENDATIONS WHEN ANCHOR ROD CONFIGURATION PLACES THE RODS IN A BENDING MODE. WHEN THE COLUMN BASE PLATE BEARS ON GROUT, THE CONTRACTOR / BUILDER OR FOUNDATION ENGINEER SHALL INVESTIGATE BENDING IN THE ANCHOR RODS AND PROVIDE A SHEAR KEY FOR THE COLUMN BASE TO THE PIER WHEN THE ANCHOR RODS ARE NOT ADEQUATE IN BENDING ABOUT THE PIER.

DESCRIPTIONS OF REACTION ABBREVIATIONS

[redacted]	[redacted]
DL	DEAD
CL OR COLL	COLLATERAL
LL	LIVE
SL	SNOW
DRIFT	SNOW DRIFT
SLIDE	SLIDING SNOW
WL1 OR WIND_L1	WIND 1 LEFT (WITH POSITIVE INTERNAL PRESSURE, +GCPI)
WR1 OR WIND_ R1	WIND 1 RIGHT (WITH POSITIVE INTERNAL PRESSURE, +GCPI)
WL2 OR WIND_L2	WIND 2 LEFT (WITH NEGATIVE INTERNAL PRESSURE, -GCPI)
WR2 OR WIND_R2	WIND 2 RIGHT (WITH NEGATIVE INTERNAL PRESSURE, -GCPI)
LW1 OR LNWIND1	LONGITUDINAL WIND, CASE 1
LW2 LNWIND2	LONGITUDINAL WIND, CASE 2
WP	WIND PRESSURE
WS	WIND SUCTION
SEISL OR SEIS_L	SEISMIC LEFT
SEISR OR SEIS_R	SEISMIC RIGHT
LNSEIS OR LN_SEISMIC	LONGITUDINAL SEISMIC
TEMP	TEMPERATURE CHANGE
LW1_L2E	LONGITUDINAL WIND, CASE 1, WIND LEFT EDGE ZONE 2E
LW1_R2E	LONGITUDINAL WIND, CASE 1, WIND RIGHT EDGE ZONE 2E
LW2_L3E	LONGITUDINAL WIND, CASE 2, WIND LEFT EDGE ZONE 3E
LW2_R3E	LONGITUDINAL WIND, CASE 2, WIND RIGHT EDGE ZONE 3E
E#PAT_LL_*	ENDWALL PATTERN LIVE (1 - LEFT, 2 - RIGHT ENDWALL)
E#PAT_SL_*	ENDWALL PATTERN SNOW (1 - LEFT, 2 - RIGHT ENDWALL)
F#PAT_LL_*	RIGID FRAME PATTERN LIVE
F#PAT_SL_*	RIGID FRAME PATTERN SNOW
E#UNB_SL_L	ENDWALL UNBALANCED SNOW LEFT
E#UNB_SL_R	ENDWALL UNBALANCED SNOW RIGHT
F#UNB_SL_L	RIGID FRAME UNBALANCED SNOW LEFT
F#UNB_SL_R	RIGID FRAME UNBALANCED SNOW RIGHT
F#CRANEA*	CRANE LOADING, SINGLE CRANE
F#CRNA2 $	A2 - TWO LARGEST CRANES IN ANY AISLE
F#CRNAM $$	AM - SIMPLE MAXIMUM SIZE IN ONE AISLE
F#CRNA $$	A - SINGLE CRANE IN ONE AISLE
F#CRNBM $	BM - LARGEST CRANE IN EACH AISLE FOR TWO ADJACENT AISLE
F#CRNC2 $	C2 - TWO CRANES IN ANY AISLE PLUS ONE CRANE IN ANY NON-ADJACENT AISLE. ALSO SINGLE CRANE AT C2 LOCATION AND DOUBLE CRANE AT OTHER LOCATION.
F#CRN B $$	B - SINGLE CRANE IN TWO ADJACENT AISLES
F#CRN C $$	C - SINGLE CRANE IN TWO NON-ADJACENT AISLES

THIS TABLE PROVIDES A DESCRIPTION OF ABBREVIATIONS FOR COMMONLY USED REACTIONS/LOADS.

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NOT FOR CONSTRUCTION

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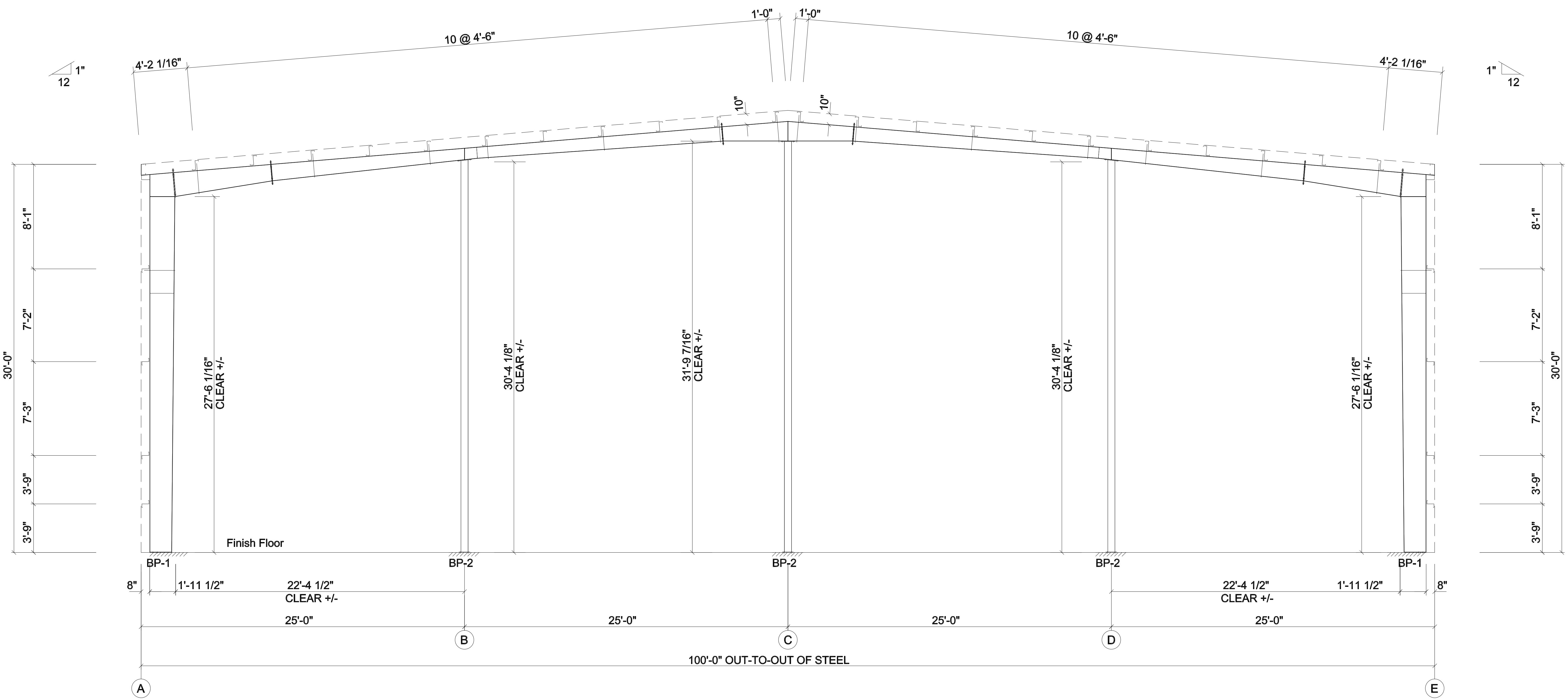
Buyer	Steel Buildings Northwest, Inc
Customer	ABC Recycling Bellingham, WA 98225
Project Name	ABC Recycling - bldg 2

CHIEF BUILDINGS

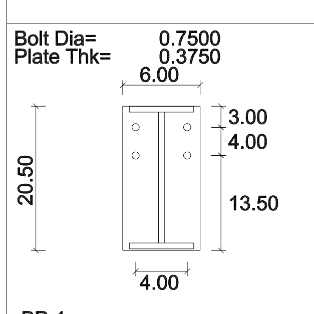
DATE DRAWN	QUOTE NO.
8/25/23	FQ74601A

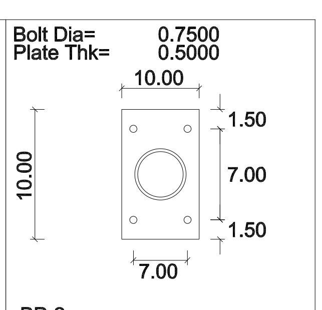
STIFFENER TABLE

Mark	Stiff Mark	Plate Size Width	Thick	Length
RF1-1	ST1	2.750	0.250	22.94
RF1-3	ST2	2.750	0.250	10.31
RF1-4	ST3	2.750	0.250	18.00



RIGID FRAME ELEVATION: FRAME LINE 1 8





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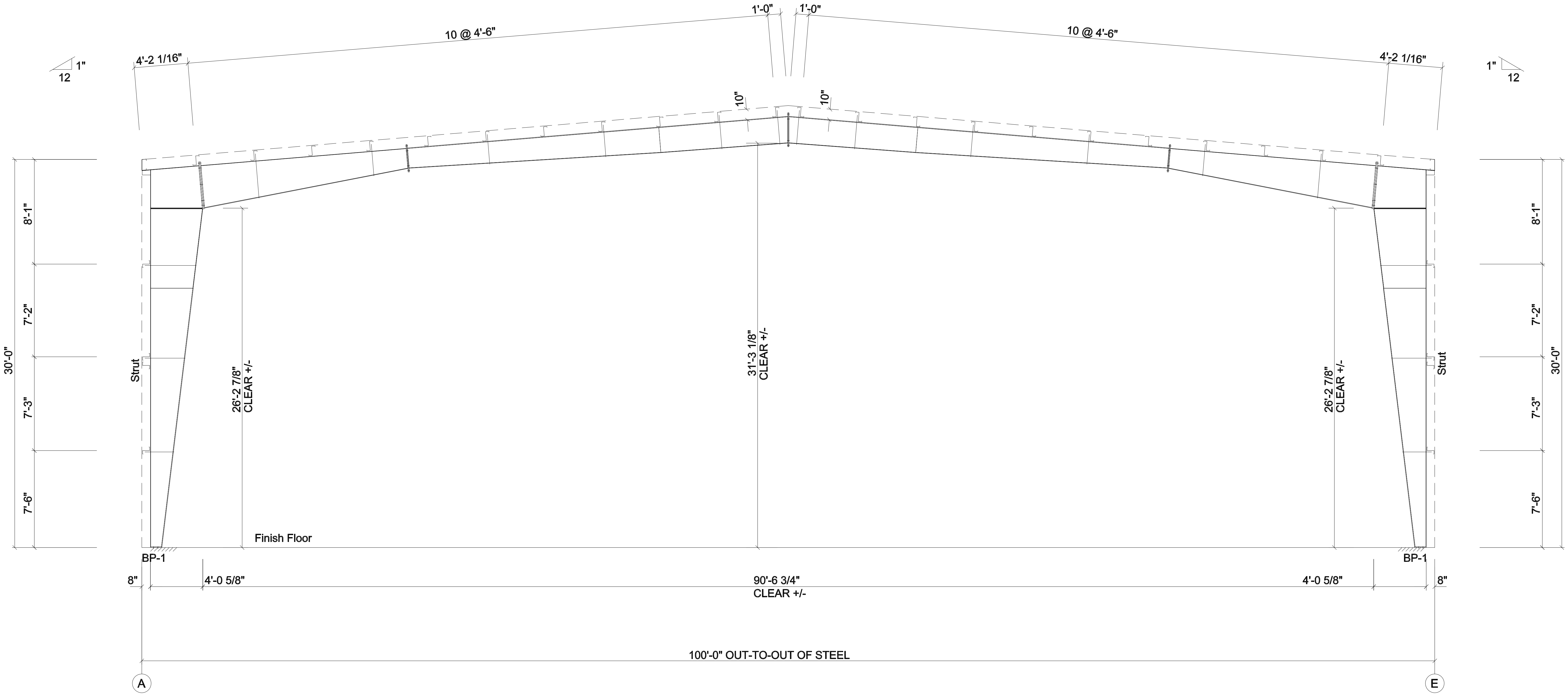
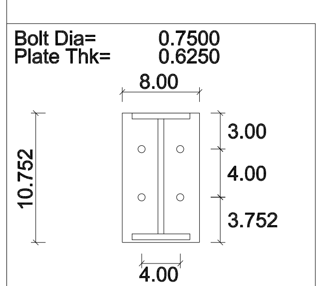
NOT FOR CONSTRUCTION

Drawing	CROSS SECTION
Buyer	Steel Buildings Northwest, Inc
Customer	ABC Recycling Bellingham, WA 98225
Project Name	ABC Recycling - bldg 2
DATE DRAWN	QUOTE NO.
8/25/23	FQ74601A

STIFFENER TABLE				
Mark	Stiff Mark	Plate Size Width	Thick	Length
RF2-1	ST1	3.750	0.313	47.94
RF2-5	ST2	3.750	0.313	47.88



RIGID FRAME ELEVATION: FRAME LINE 2 3 6 7



BP-1

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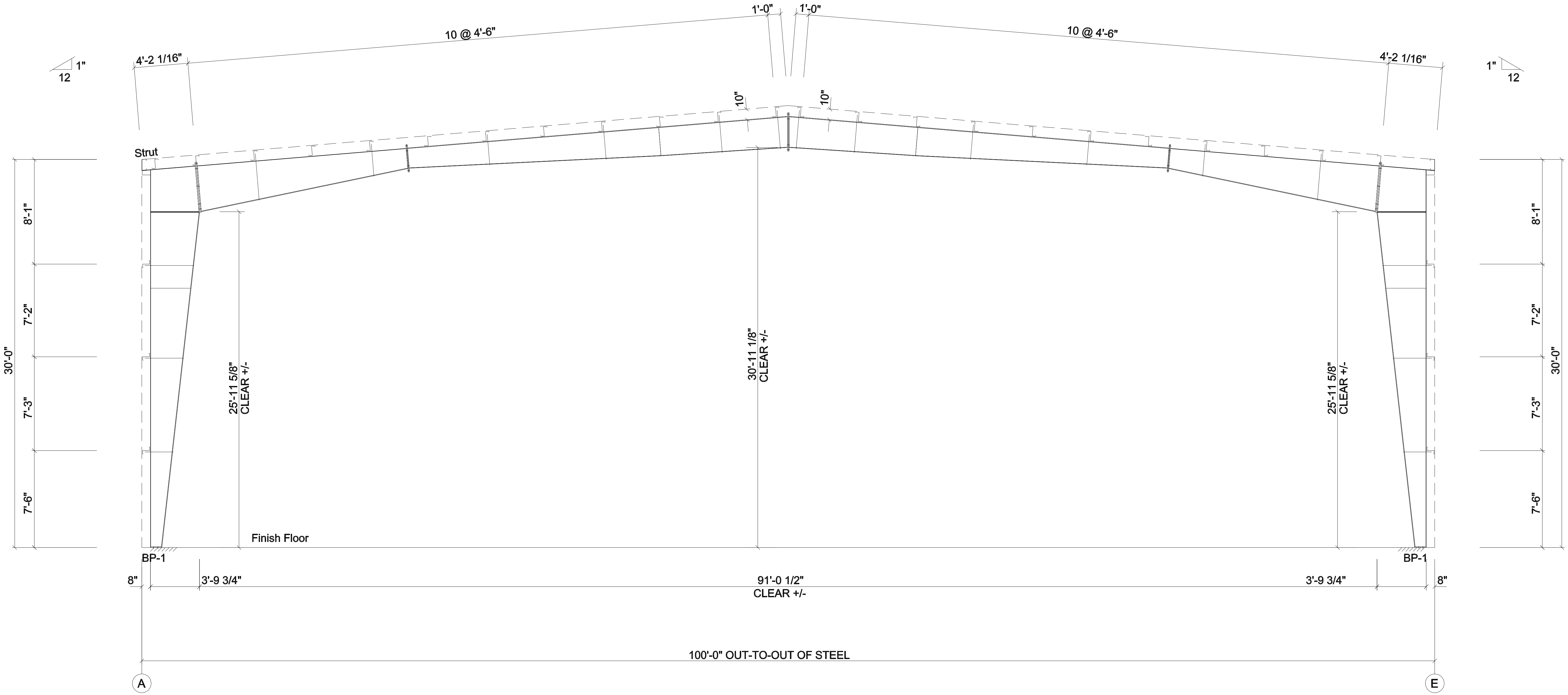
NOT FOR CONSTRUCTION

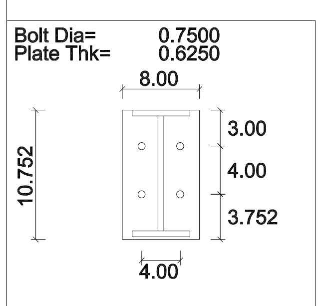
Drawing	CROSS SECTION
Buyer	Steel Buildings Northwest, Inc
Customer	ABC Recycling Bellingham, WA 98225
Project Name	ABC Recycling - bldg 2
DATE DRAWN	8/25/23
QUOTE NO.	FQ74601A

CHIEF BUILDINGS

STIFFENER TABLE				
	Stiff	Plate Size		
Mark	Mark	Width	Thick	Length
RF3-1	ST1	3.750	0.313	44.94
RF3-5	ST2	3.750	0.313	44.94



RIGID FRAME ELEVATION: FRAME LINE 4 5



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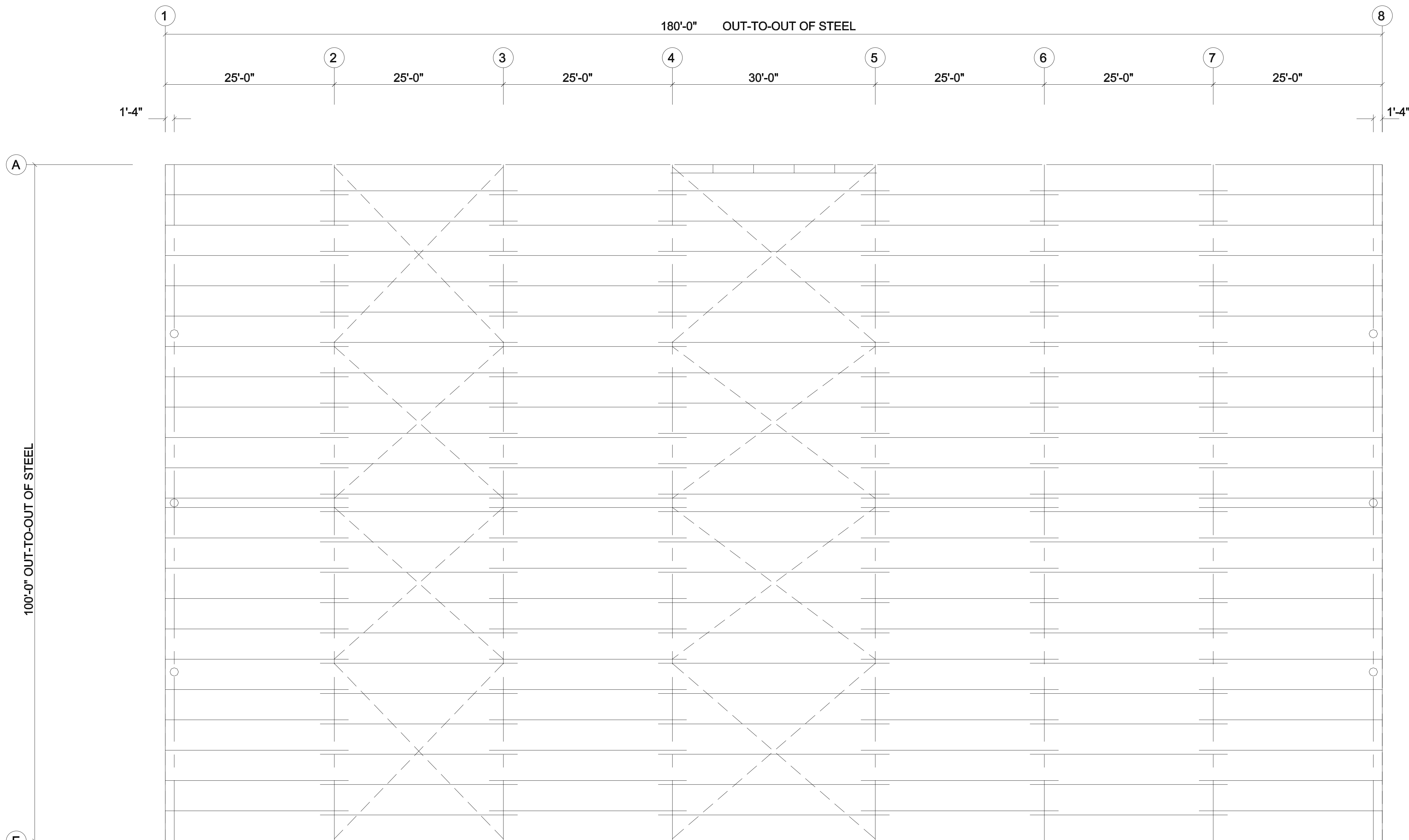
Buyer	Steel Buildings Northwest, Inc
Customer	ABC Recycling Bellingham, WA 98225
Project Name	ABC Recycling - bldg 2

CHIEF BUILDINGS	DATE DRAWN	QUOTE NO.
	8/25/23	FQ74601A



ROOF FRAMING PLAN

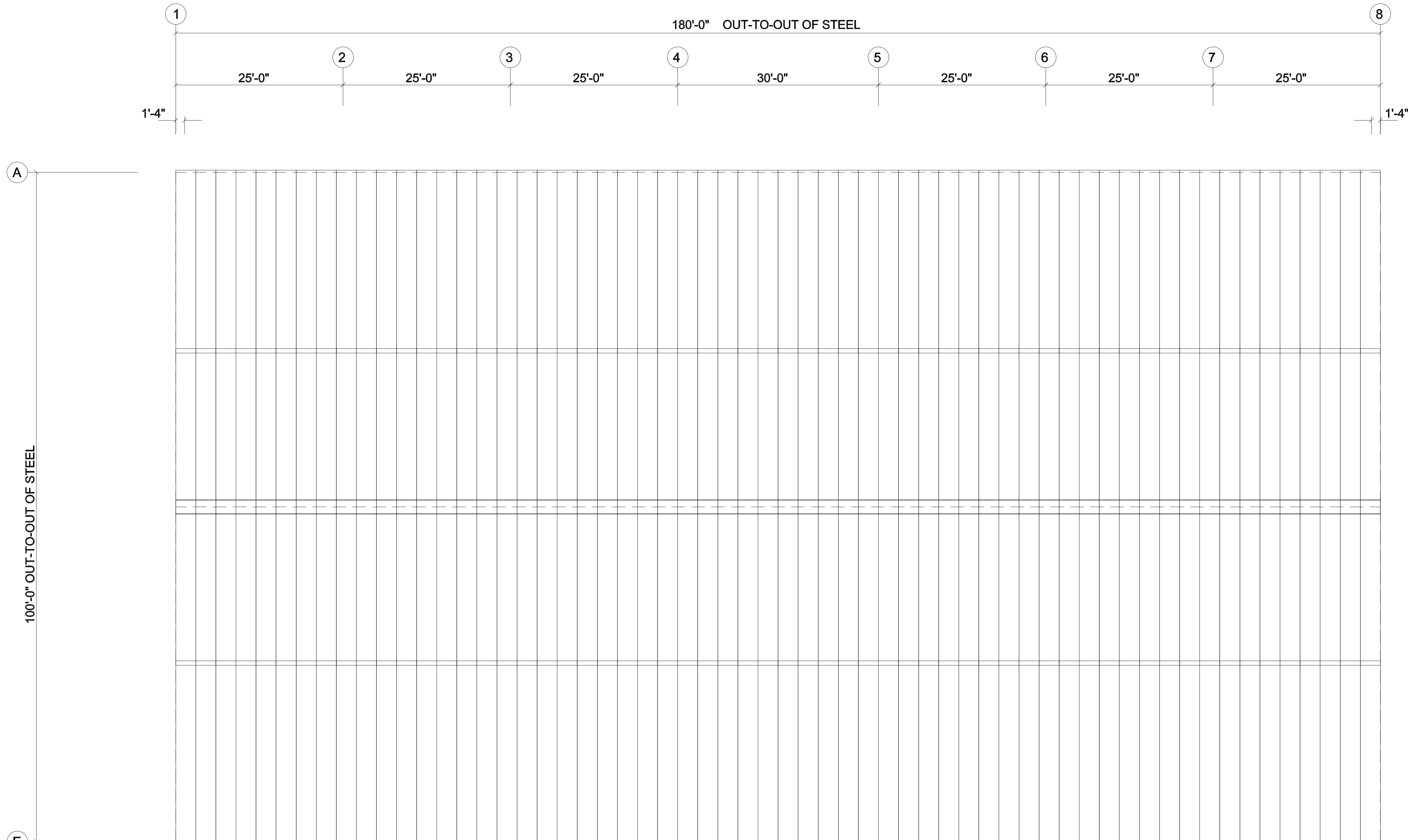
PRELIMINARY

- Preliminary drawings for sales and estimating purposes only.
- Subject to change during order process.

NOT FOR CONSTRUCTION

Drawing	ROOF FRAMING
Buyer	Steel Buildings Northwest, Inc
Customer	ABC Recycling Bellingham, WA 98225
Project Name	ABC Recycling - bldg 2

CHIEF BUILDINGS	DATE DRAWN	QUOTE NO.
	8/25/23	FQ74601A



ROOF SHEETING PLAN

PANELS: 26 Ga. CS - Std.PVDF-FEVE Finish

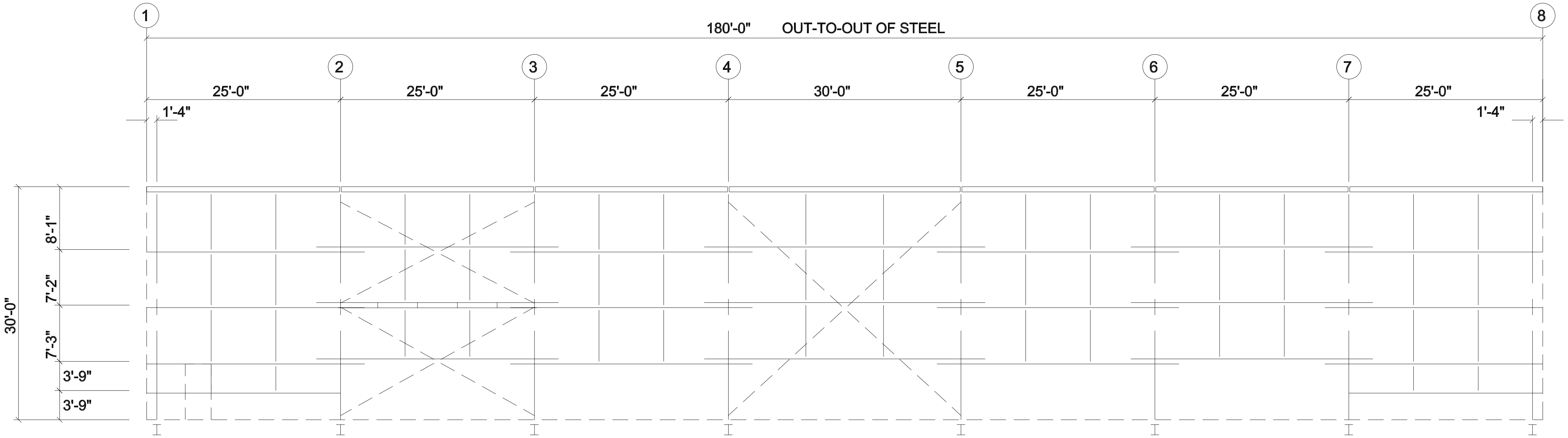
PRELIMINARY

- Preliminary drawings for sales and estimating purposes only.
- Subject to change during order process.

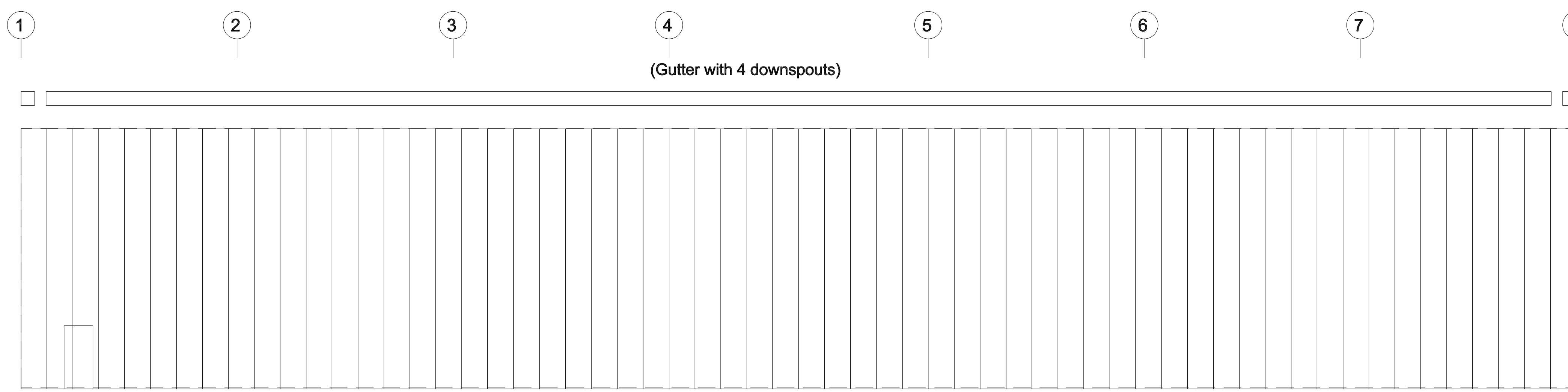
NOT FOR CONSTRUCTION

Drawing	ROOF SHEETING
Buyer	Steel Buildings Northwest, Inc
Customer	ABC Recycling Bellingham, WA 98225
Project Name	ABC Recycling - bldg 2

CHIEF BUILDINGS	DATE DRAWN	QUOTE NO.
	8/25/23	FQ74601A



SIDEWALL FRAMING: FRAME LINE E



SIDEWALL SHEETING & TRIM: FRAME LINE E

PANELS: 26 Ga. TBD - Std. SMP Finish

GIRT DEPTH: 8.00

PRELIMINARY

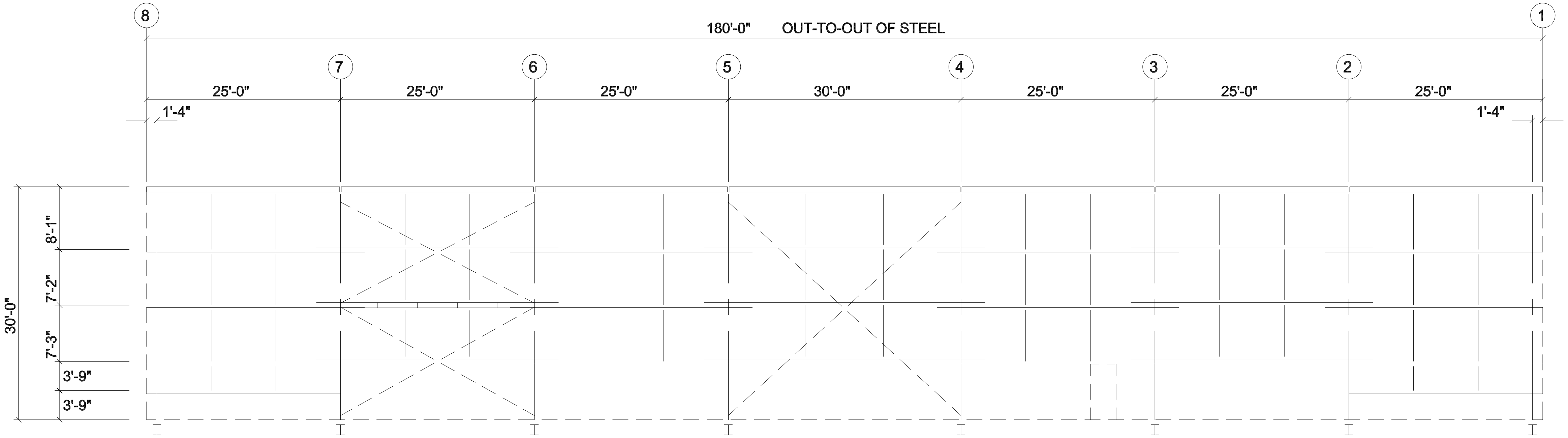
- Preliminary drawings for sales and estimating purposes only.
- Subject to change during order process.

NOT FOR CONSTRUCTION

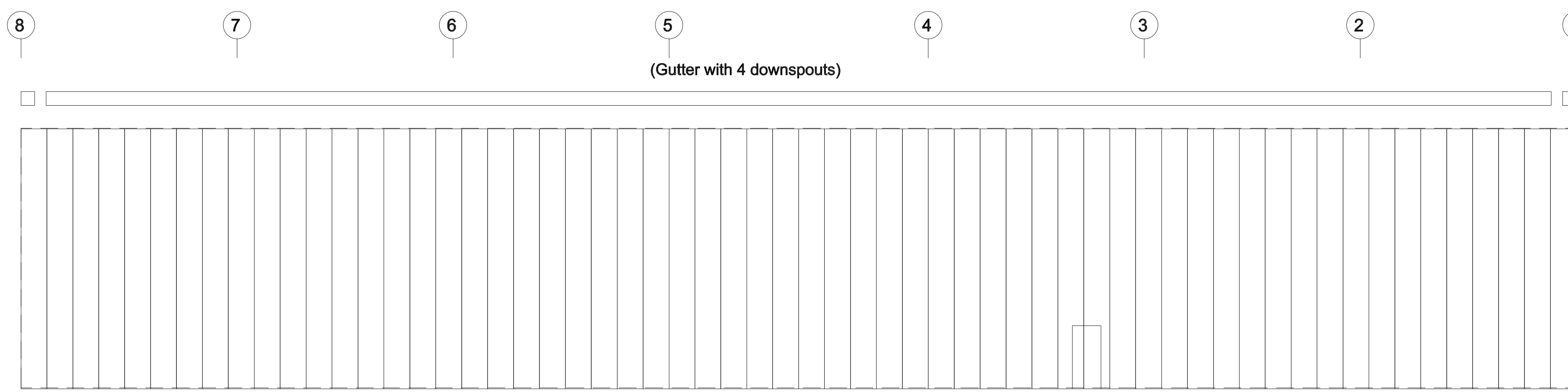
Drawing	SIDEWALL DRAWING
Buyer	Steel Buildings Northwest, Inc
Customer	ABC Recycling Bellingham, WA 98225
Project Name	ABC Recycling - bldg 2

CHIEF BUILDINGS

DATE DRAWN	QUOTE NO.
8/25/23	FQ74601A



SIDEWALL FRAMING: FRAME LINE A



SIDEWALL SHEETING & TRIM: FRAME LINE A

PANELS: 26 Ga. TBD - Std. SMP Finish

GIRT DEPTH: 8.00

PRELIMINARY

- Preliminary drawings for sales and estimating purposes only.
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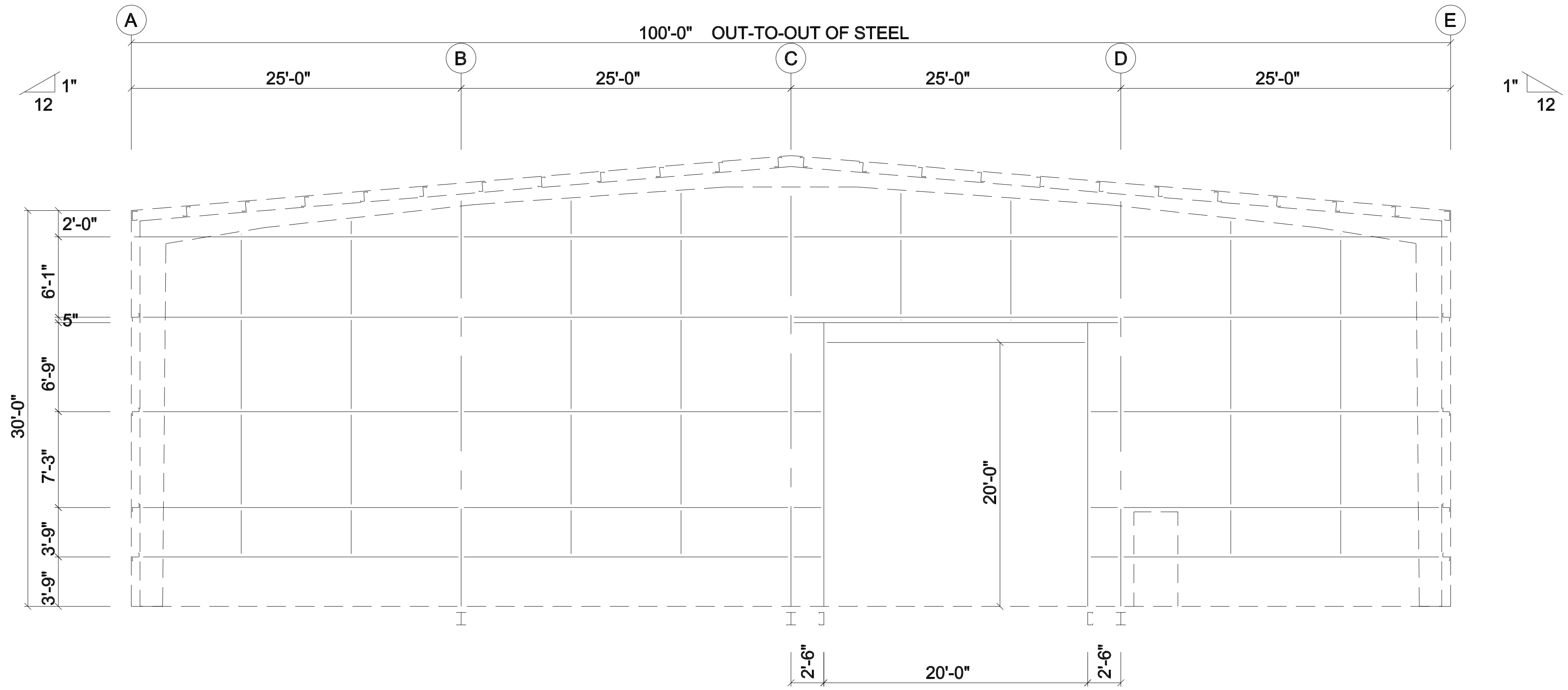
NOT FOR CONSTRUCTION

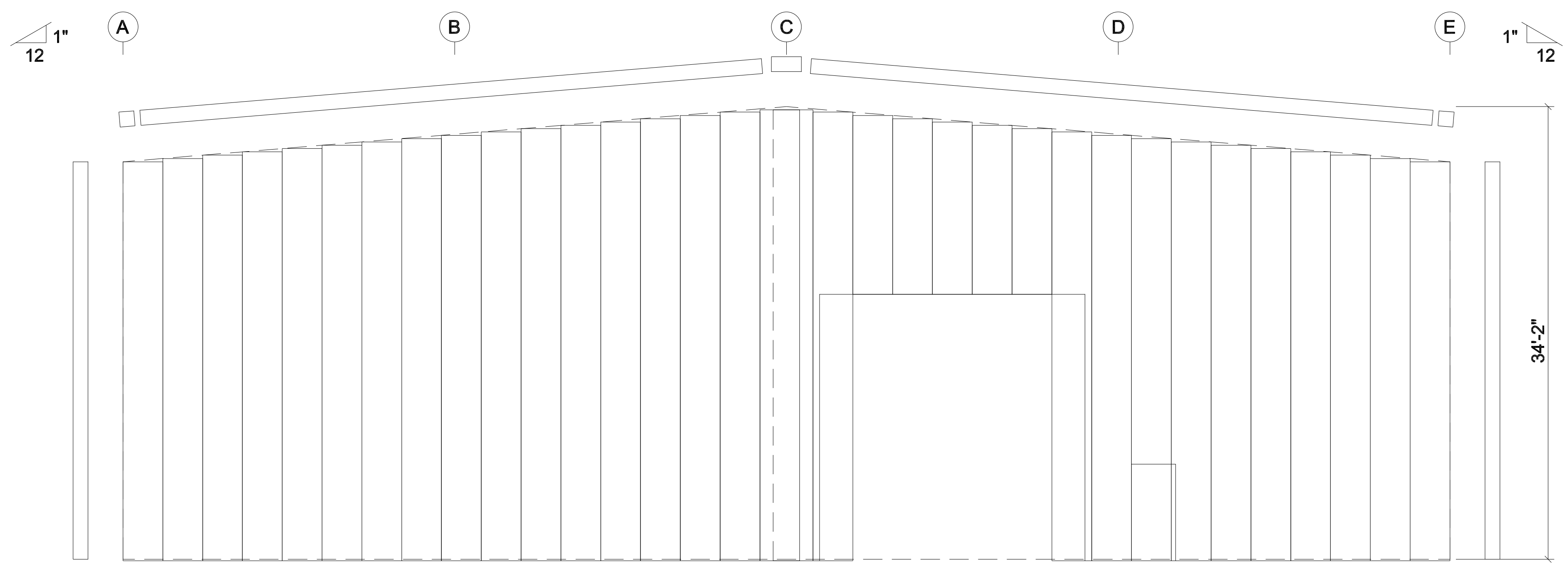
Drawing	SIDEWALL DRAWING
Buyer	Steel Buildings Northwest, Inc
Customer	ABC Recycling Bellingham, WA 98225
Project Name	ABC Recycling - bldg 2

DATE DRAWN	QUOTE NO.
8/25/23	FQ74601A

CHIEF BUILDINGS



ENDWALL FRAMING: FRAME LINE 1



ENDWALL SHEETING & TRIM: FRAME LINE 1

PANELS: 26 Ga. TBD - Std. SMP Finish

GIRT DEPTH: 10.00

PRELIMINARY

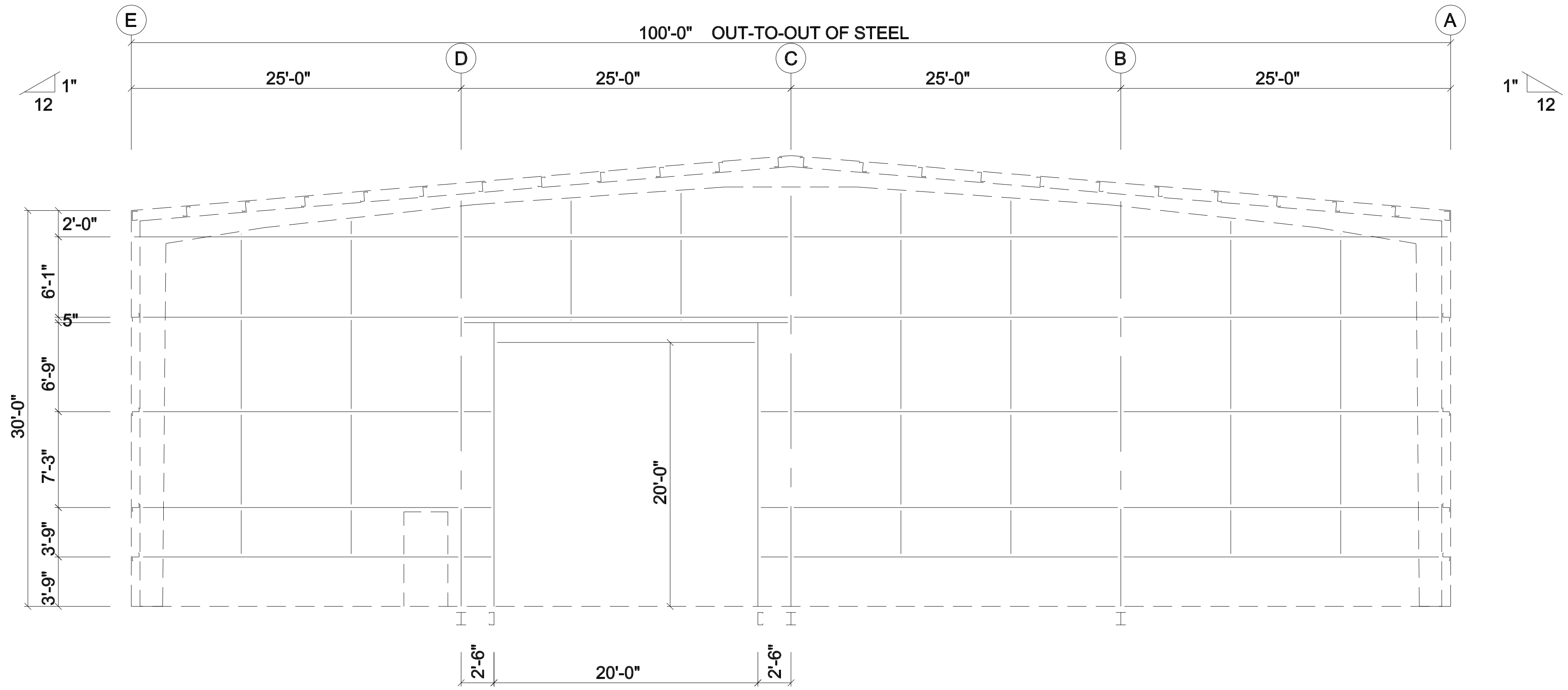
- Preliminary drawings for sales and estimating purposes only.
- Subject to change during order process.

NOT FOR CONSTRUCTION

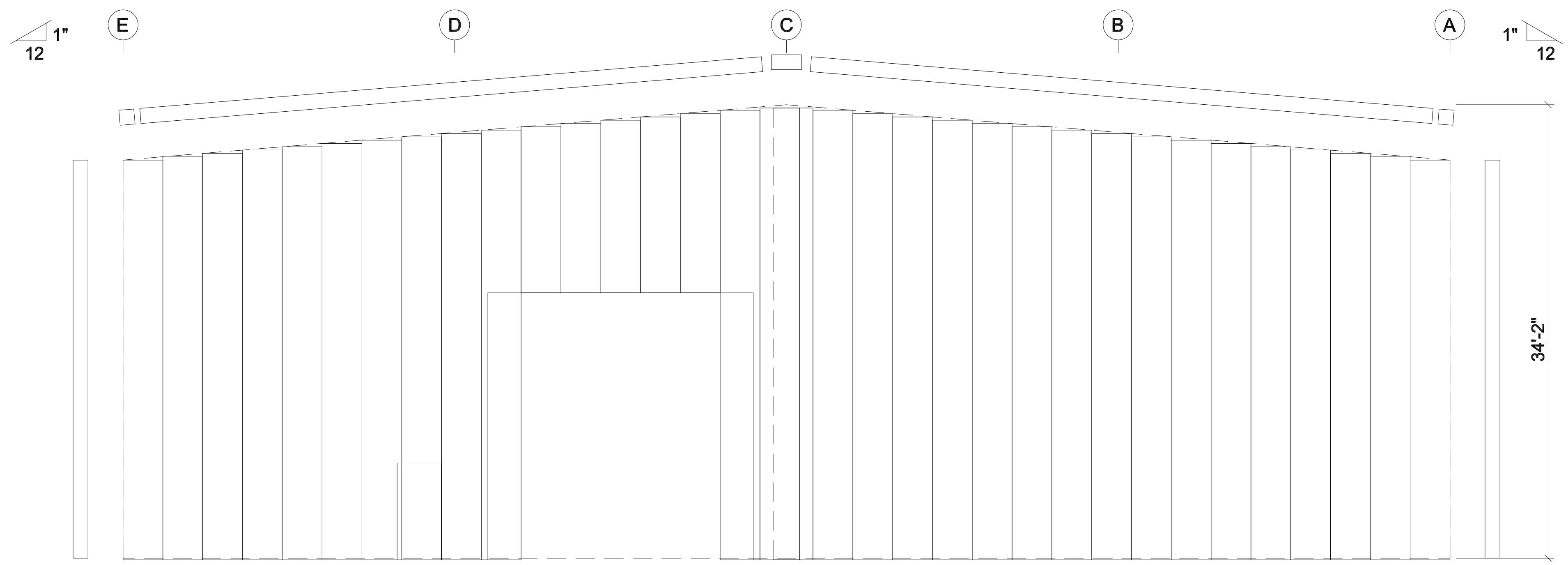
Drawing	ENDWALL DRAWING
Buyer	Steel Buildings Northwest, Inc
Customer	ABC Recycling Bellingham, WA 98225
Project Name	ABC Recycling - bldg 2

CHIEF BUILDINGS

DATE DRAWN	QUOTE NO.
8/25/23	FQ74601A



ENDWALL FRAMING: FRAME LINE 8



ENDWALL SHEETING & TRIM: FRAME LINE 8

PANELS: 26 Ga. TBD - Std. SMP Finish

GIRT DEPTH: 10.00

PRELIMINARY

- Preliminary drawings for sales and estimating purposes only.
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NOT FOR CONSTRUCTION

Drawing	ENDWALL DRAWING
Buyer	Steel Buildings Northwest, Inc
Customer	ABC Recycling Bellingham, WA 98225
Project Name	ABC Recycling - bldg 2

CHIEF BUILDINGS	DATE DRAWN	QUOTE NO.
	8/25/23	FQ74601A

SPECIFICATIONS

GENERAL NOTES

1. The following notes, details, schedules & specifications shall apply to all phases of this project unless specifically noted otherwise. Notes and details on the structural plans shall take precedence over general notes and typical details. Where no details are given, construction shall be as shown for similar work.
2. All drawings are considered to be part of the contract documents. The Contractor shall be responsible for the review and coordination of all drawings and specifications prior to the start of construction. Any discrepancies shall be brought to the attention of the Engineer prior to the start of construction so that a clarification can be issued. Any work performed in conflict with the contract documents or any applicable code requirements shall be corrected by the Contractor at no expense to the Owner or Engineer.
3. All information on existing conditions shown on the structural plans are based on best present knowledge available, but without guarantee of accuracy. The Contractor shall be responsible for the verifications of all dimension and conditions at the site. Any discrepancies between actual site conditions and information shown on the drawings or in the specifications shall be brought to the attention of the EOR prior to the start of construction.
4. Refer to the Architectural plans for the following:
   (a) Dimensions
   (b) Size and location of all interior and exterior wall locations.
   (c) Size and location of all floor, roof and wall openings
   (d) Size and location of all drains, slopes, depressions, steps, etc.
   (e) Specification of all finishes & waterproofing
   (f) All other non-structural elements
5. Refer to the mechanical, electrical and plumbing plans for the following:
   (a) Size and location of all equipment
   (b) Pipe runs, sleeves, hangers and trenches
   (c) All other mechanical, electrical or plumbing related elements
6. **DO NOT** scale structural plans. Contractor shall use all written dimensions on Architectural plans.
7. Construction materials shall be uniformly spread out if placed on floor or roof so as to not overload the framing. Load shall not exceed the design live load per square foot. It is the Contractor's responsibility to provide adequate shoring and/or bracing as required.
8. Specifications and detailing of all waterproofing and drainage items, while sometimes shown on the structural plans for general information purposes only, are solely the design responsibility of others.
9. The Engineer will not be responsible for and will not have control or charge of construction means, methods, techniques, sequences or procedures, or for safety precautions and programs in connection with the construction delineated by these plans. It should be understood that the Contractor or his/her agent(s) shall supervise and direct all work and shall be solely and completely responsible for all construction means, methods, techniques, sequences, procedures and conditions on the job site, including safety of all persons and property during the entire period of construction. Periodic observations by the Engineer, his staff or representatives are not intended to include verification of dimensions or review the adequacy of the Contractor's safety measures on or near the construction site.
10. Modifications of the plans, notes, details and specifications shall not be permitted without prior approval from the Engineer.
11. All workmanship shall conform to the best practice prevailing in the various trades performing the work. The Contractor shall be responsible for coordinating the work of all trades.
12. It is the Contractor's responsibility to ensure that only approved structural plans are used during the course of construction. The use of unapproved documents shall be at the contractor's own risk. Corrections of all work based on such documents shall be performed at the Contractor's expense.
13. These plans and specifications represent the structural design only. No information nor warranty is provided for the work of any other Consultant (Architect, Mechanical, Electrical, etc.). This includes, but is not limited to, waterproofing, drainage, ventilation, accessibility, or dimensions.

FOUNDATIONS

1. Refer to Structural Design Parameters section on sheet S-1.1 for all soil design values used in calculations.
2. Soils values per to be confirmed by Geotechnical during construction.
3. It is the Contractor's responsibility to obtain a copy of the soils report from the Owner. A copy of the soils report shall be on the job site during the course of construction.
4. Unexpected Soil Conditions: Allowable values and subsequent foundation designs are based on soil conditions which are shown by test borings. Actual soil conditions which deviate appreciably from that shown in the test borings shall be reported to the Engineer immediately.
5. All compaction, fill, backfilling and site preparation shall be performed in accordance with project soils report or the Governing Building Code Chapter 18 & Appendix J. All such work shall be performed per the recommendations of the project soils engineer.
6. Excavate to required depths and dimensions (as indicated in the drawings), cut square and smooth with firm level bottoms. Care shall be taken not to over-excavate foundation at lower elevation and prevent disturbance of soils around high elevation.
7. Foundations shall be poured in neat excavations.
8. Excavate all foundations to required depths into compacted fill or natural soil (as per plans and details) and as verified by the building official and/or soils engineer.
9. All foundations shall be inspected and approved by the appropriate building official and/or a representative of the soils engineer prior to forming and placement of reinforcing or concrete.
10. Foundations shall not be poured until all required reinforcing steel, framing hardware, sleeves, inserts, conduits, pipes, etc. and formwork is properly placed and inspected by the appropriate building official/inspector(s).
11. It is the responsibility of the contractor in charge of framing to properly position all holdown bolts, anchor bolts, column bases, and all other cast-in-place hardware. Refer to typical details. All hardware to be secured prior to foundation inspections.
12. The sides and bottoms of dry excavations must be moistened just prior to placing concrete. Conversely, de-water footings as required to remove standing water and to maintain optimum working conditions.
13. The Contractor shall be solely responsible for all excavation procedures including lagging, shoring, and the protection of adjacent property, structures, streets, and utilities in accordance with all federal, state and local safety ordinances. The Contractor shall provide for the design and installation of all cribbing, bracing and shoring required.

CONCRETE

1. All concrete shall have:
   (a) an ultimate compressive strength (f'c) of 3,000 psi at 28 days (UNO).
   (b) a maximum slump of 5" at point of placement.
   (c) a W/C ratio of 0.55 or less for all slabs, walls, and columns, and 0.60 or less for all foundations.
   (d) a normal dry-weight density (UNO).
2. Testing of materials used in concrete construction must be performed as noted on structural plans or at the request of the Building Department to determine if materials are quality specified. Tests of materials and of concrete shall be made by an approved agency and at the expense of the contractor; such tests shall be made in accordance with the standards listed in the Governing Building Code, Table 1704.4. When testing of concrete is required, four (4) test cylinders shall be taken from each 150 yards, or fraction thereof, poured in any one day. One (1) cylinder shall be tested at seven (7) days; two (2) at 28 days; one (1) shall be held in reserve. If Contractor elects to have additional tests performed for "early-break" results, additional test cylinders must be taken. At no time shall the Contractor instruct the testing agency to perform tests on a schedule different than above without the prior authorization of the Engineer. Contractor is responsible for complying with applicable testing requirements of theBuilding Department. Copies of all test reports shall be provided to Engineer and Building Department for review in a timely manner.
3. The Contractor shall remove and replace any concrete which fails to attain specified 28 day compressive strength if so directed by the Engineer. Any defects in the hardened concrete shall be repaired to the satisfaction of the Engineer and/or Architect or the hardened concrete shall be replaced at the Contractor's expense.
4. All concrete work shall conform with the Governing Building Code, Chapter 19.
5. All cement shall be Portland Cement Type I or II and shall conform to ASTM C 150.
6. All aggregates shall conform to ASTM C33. Maximum aggregate sizes:
   (a) Footings: 1-1/2"
   (b) All other work: 3/4"
7. Where not specifically detailed, the minimum concrete cover on reinforcing steel shall be:
   (a) Permanently exposed to earth or weather
      i. Cast against earth: 3"
      ii. Cast against forms: 2"
   (b) Not exposed to earth or weather
      i. Slabs, walls, joists: 3/4"
      ii. Beams, girders, columns: 1-1/2"
8. The minimum lap splice length for all reinforcing steel shall be as noted in the typical details on sheet S-1.1. All lap splices to be staggered.
9. All reinforcing steel, anchor bolts, dowels, inserts, and any other hardware to be cast in concrete shall be well secured in position prior to foundation inspection. All hardware to be installed in accordance with respective manufacturer's specifications. Refer to architectural and structural plans for locations of embedded items.
10. Locations of all construction joints, other than specified on the structural plans, shall be approved by the Architect and Engineer prior to forming. Construction joints shall be thoroughly air and water cleaned and heavily roughened so as to expose coarse aggregates. All surfaces to receive fresh concrete shall be maintained continuously wet at least three (3) hours in advance of concrete placement. Unless specifically detailed or otherwise noted, construction and control joints shall be provided in all concrete slabs-on-grade. Joints shall be located such that the area does not exceed 400 sq. feet.
11. The Architect, Engineer and appropriate inspectors shall be notified in a timely manner for a reinforcement inspection prior to the placement of any concrete.
12. The Contractor shall obtain approval from the Architect and the Engineer prior to placing sleeves, pipes, ducts, chases, coring and opening on or through structural concrete beams, walls, floors, and roof slabs unless specifically detailed or noted on the plans. All piles or conduits passing through concrete members shall be sleeved with standard steel pipe sections.
13. The Contractor is responsible for design, installation, maintenance and removal of all formwork. Forms shall be properly constructed, sufficiently tight to prevent leakage, sufficiently strong, and braced to maintain their shape and alignment until no longer needed for concrete support. Joints in formwork shall be tightly fitted and blocked, and shall produce a finished concrete surface that is true and free from blemishes. Forms for exposed concrete shall be pre-approved by the Architect to ensure conformance with design intent.
14. Remove form work in accordance with the following schedule:
   (a) Forms at slab edge: 1 day
   (b) Side forms at footings: 2 days
   (c) All other vertical surfaces: 7 days
   (d) Beams, columns, girders: 15 days
   (e) Elevated slabs: 28 days
   Engineer reserves the right to modify removal schedule above based on field observations, concrete conditions, and/or concrete test results.
15. All concrete (except slabs-on-grade 6" or less) shall be mechanically vibrated as it is placed. Vibrator to be operated by experienced personnel. The vibrator shall be used to consolidate the concrete. The vibrator shall not be used to convey concrete, nor shall it be placed on reinforcing and/or forms.
16. Concrete shall be maintained in a moist condition for a min. of five (5) days after placement.
17. Concrete shall not be permitted to free fall more than six (6) feet. For heights greater than six (6) feet, use tremie, pump or other method consistent with applicable standards.
18. When specified ultimate compressive strength is greater than 2500 psi, Contractor shall submit mix designs to Architect and Engineer for approval seven (7) days prior toplacement. Mix designs shall be prepared by an approved testing laboratory. Sufficient data must be provided for all admixtures.
19. Refer to Architectural plans for locations of all dimensions, slab depressions, slopes, drains, curbs, and control joints.

REINFORCEMENT

1. Reinforcing steel shall be to deformed, clean, free of rust, grease or any other material likely to impair concrete bond.
2. All bars shall conform to ASTM A615, Grade 60 minimum (UNO on structural plans). All weld wire fabric (WWF) shall conform to ASTM A185.
3. Reinforcing steel that is to be welded shall conform to ASTM A706. All welding of reinforcement shall be subject to special inspection.
4. Contractor shall take necessary steps (standard ties, anchorage devices, etc.) to secure all reinforcing steel in their true position and prevent displacement during concrete placement.
5. Fabrication, placement and installation of reinforcing steel shall conform to:
   (a) Concrete Reinforcing Steel Institute (CRSI) Manual of Standard Practice
   (b) the Governing Building Code, Section 1907.
6. Shop drawings for fabrication of reinforcing steel shall be approved by the Contractor and submitted to the Architect and Engineer for review and approval prior to fabrication. Shop drawings are not required for slabs-on-grade or foundations unless specifically noted on the structural plans.
7. Heating of reinforcing steel to aid in bending and shaping of bars is not permitted. All bends in reinforcing steel are to be made cold. All bend radii shall conform to CRSI Manual of Standard Practice.
8. Refer to Concrete and Masonry notes for specific minimum splice length and splice staggering requirements. Lap welded wire fabric (WWF) reinforcement two (2) modules minimum (UNO). All splices are to be staggered.

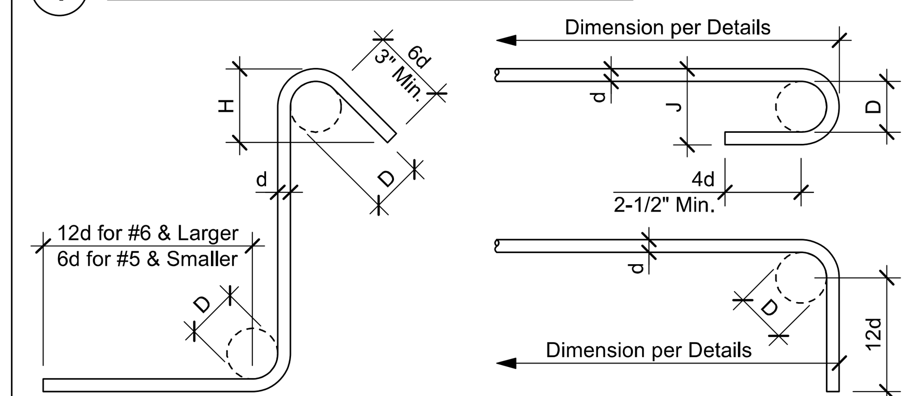
ABC Recycling

Building 3 & 4 Reclamation

741 Marine Drive
Bellingham, Washington

STANDARD DETAILS

1 TYPICAL REINFORCING BAR BENDS



STANDARD TIES & STIRRUPS

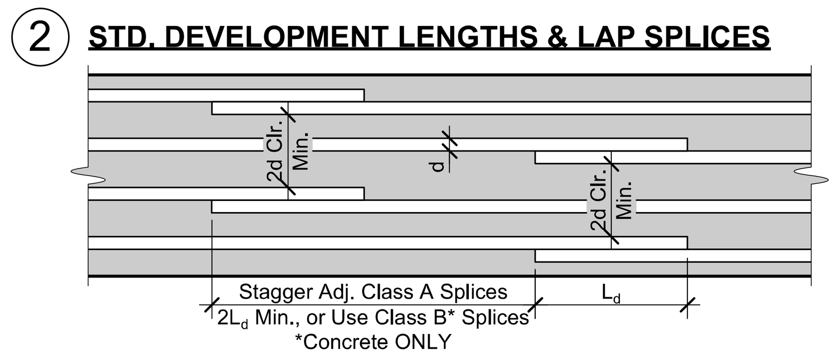
Bar Size	D	H (Approx.)
#3	1-1/2"	3"
#4	2"	3"
#5	2-1/2"	3-3/4"
#6	4-1/2"	4-1/2"
#7	5-1/4"	5-1/4"
#8	6"	6"

STANDARD END HOOKS

Bar Size	D	J
#3	2-1/4"	3"
#4	3"	4"
#5	3-3/4"	5"
#6	4-1/2"	6"
#7	5-1/4"	7"
#8	6"	8"

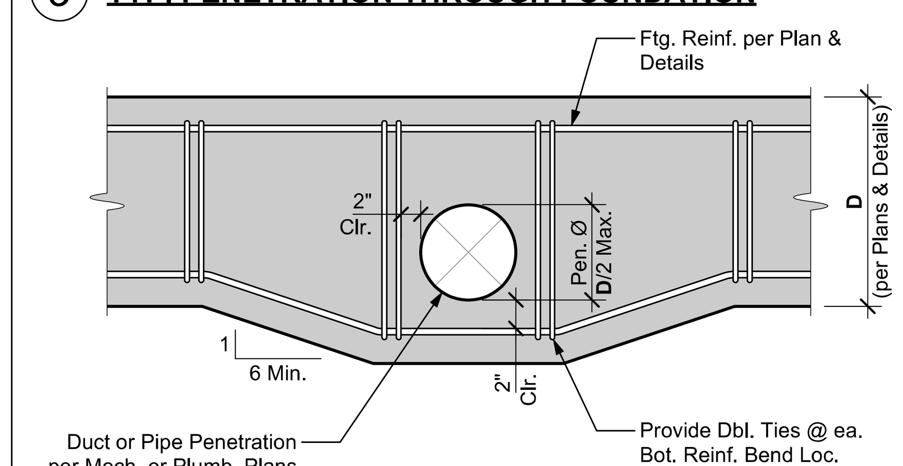
Note:
All Bar Bend Diameters & End Lengths Must Conform to the CRSI Manual of Standard Practice

2 STD. DEVELOPMENT LENGTHS & LAP SPLICES



CONCRETE			
Bar Size	Length of Lap, L_d Class A	Length of Lap, L_d Class B	Embed. of Hook, L_{dh}
#3	16"	21"	7"
#4	22"	28"	9"
#5	27"	35"	11"

3 TYP. PENETRATION THROUGH FOUNDATION

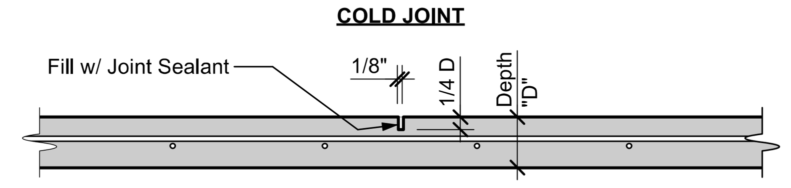


DO NOT Locate Pen. w/n 24" of Any Holdowns

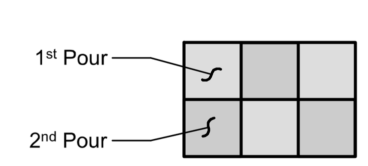
Ties:
Ftg. Reinf. = (1) Bar T&B, Use #3 Vert. w/ 180º Hook ea. End
Ftg. Reinf. > (1) Bar T&B, Use #3 Stirrup w/ 135º Hooks @ Top

4 TYPICAL CONCRETE SLAB JOINTS

COLD JOINT



SAWCUT JOINT



Notes:
1. Pour Slab in Alt. Bays, 12'-0" Sq. Max.
2. Slab May be Poured Monolithically if Sawcut @ 12'-0" Max. Ea. Way
3. Exp. Joints per Plan.

ABBREVIATIONS

AB	Anchor Bolt	Mas.	Masonry
A&B	Above and Below	Max.	Maximum
Abv.	Above	MB	Machine Bolt
Adn.	Addition (al)	MF	Moment Frame
Adj.	Adjacent, Adjustable	Mfr.	Manufacture(r)
Alt.	Alternate (ive)	Min.	Minimum, Minute
Appd.	Approved	Mod.	Modif(y), (ication)
Arch.	Architect(ural)	Mtl.	Metal
Avg.	Average	(N)	New
Bdry.	Boundary	N/A	Not Applicable
Bldg.	Building	Nat.	Natural
Blk(g).	Block (ing)	NTS	Not to Scale
Bm.	Beam	o/	Over
BN	Boundary Nailing	oc	On Center
B-O	Bottom of	OD	Outside Diameter
BO	By Others	Opng.	Opening
Bot.	Bottom	Opp.	Opposite
Brg.	Bearing	Opt.	Optional
Btwn.	Between	Para.	Parallel
BW	Both Ways	PCF	Lbs per Cubic Ft.
Cant.	Cantilever(ed)	Pen.	Penetrate, (tion)
CIP	Cast in Place	Perf.	Perforated
CJ	Ceiling Joist	Perim.	Perimeter
CJP	Complete Joint Penetration	Perp.	Perpendicular
		PI	Panel Index
CL	Center Line	PJP	Partial Joint Pen.
Clg.	Ceiling	PL	Plate
CMU	Conc. Masonry Unit	PLF	Lbs per Linear Ft.
Col.	Column	Pl.	Plate
Com.	Common	Ply.	Plywood
Comp.	Component	Prep.	Prepare, (tion)
Conc.	Concrete	Press.	Pressure
Conn.	Connection	Proj.	Project
Const.	Construction	Prop.	Property
Cont.	Continue (ous)	PSF	Lbs per Square Ft.
Ctr.	Center	PSI	Lbs per Square In.
d	Penny	PT	Pressure-Treated
Dbl.	Double	R	Radius
Defl.	Deflection	Rec(s).	Recommendation(s)
Deg.	Degree	Rect.	Rectangular
Demo.	Demolish (tion)	Ref.	Reference
Dep.	Depress(ed)	Reinf.	Reinforce(d), (ment), (ing)
DF	Douglas Fir		
Dia.	Diameter	Req(d).	Require(d)
Diaph.	Diaphragm	Reqs.	Requirements
Dif.	Different	Ret.	Retain(ing)
Dim.	Dimension	RJ	Roof Joist
Dist.	Distance	RR	Roof Rafter
DJ	Deck Joist	RW	Redwood
DL	Dead Load	SAD	See Arch Dwg's
Dwg.	Drawing	Sched.	Schedule
(E)	Existing	Sgl.	Single
Ea.	Each	Shtg.	Sheathing
EF	Each Face	Sim.	Similar
EFP	Equivalent Fluid Pressure	SIP	Str. Insulated Panel
		SM	Sheet Metal
Elev.	Elevator, Elevation	SMS	Sheet Metal Screw
Embed.	Embed(ed), (ment)	SOG	Slab on Grade
Engr.	Engineer	Spec.	Specifi(ed), (cations)
EOR	Engineer of Record	Std.	Standard
Eq.	Equal, Equivalent	Stl.	Steel
ES	Each Side	Struc.	Structure, (al)
EW	Each Way	SW	Shear Wall
Exp.	Expand, Expansion	Sym.	Symmet(ry), (rical)
Ext.	Exterior	T&B	Top and Bottom
Fdn.	Foundation	T&G	Tongue and Groove
FF	Finished Floor	Temp.	Temporary
FJ	Floor Joist	Thk.	Thick(ness)
Flr(g).	Floor (ing)	Thru	Through
FOC	Face of Concrete	TN	Toe-Nail
FOM	Face of Masonry	TP	Top Plate
FOS	Face of Studs	T-O	Top of
FOW	Face of Wall	TOB	Top of Beam
Frmg.	Framing	TOC	Top of Concrete
Ft.	Foot, Feet	TOG	Top of Grade
Ftg.	Footing	TOM	Top of Masonry
Ga.	Gage, Gauge	TOS	Top of Steel
Galv.	Galvanized	TOW	Top of Wall
GB	Grade Beam	TRU	To Remain Unchanged
GC	General Contractor		
Gyp.	Gypsum	Trmr.	Trimmer Stud
Hldn.	Holdown	Typ.	Typical
Hdr.	Header	UNO	Unless Noted Otherwise
Hdw.	Hardware		
Hgr.	Hanger	Vert.	Vertical
Hor(iz).	Horizontal	VIF	Verify in Field
Ht.	Height	VWA	Verify with Arch
ID	Inside Diameter	w/	With
In.	Inch(es)	w/n	Within
Insp.	Inspect(ion)	w/o	Without
Int.	Interior	WS	Wood Screw
Inv.	Invert, Inverted	Wndw.	Window
Jst.	Joist	Wt.	Weight
K	Kips (1,000 pounds)	WWF	Welded Wire Fabric
KLF	Kips per Linear Ft.	Yd.	Yard
King	King Stud		
KP	King Post	@	At
KSF	Kips per Square Ft.	°	Degrees
KSI	Kips per Square In.	>	Greater Than
Lb(s).	Pound(s)	<	Less Than
LL	Live Load	#	Number, Pound(s)
Loc.	Location	/	Per
LW	Light Weight	%	Percent(age)
		±	Plus or Minus

PROJECT INFORMATION

CLIENT:
ABC Recycling
Steven Shinn
661 Cornwall Ave.
Bellingham, WA 98225
(360) 472-2880

ARCHITECT / DESIGNER:
Steel Buildings Northwest, Inc.
North Plains, Oregon
(530) 624-7185

SOILS/GEO. ENGINEER:
N/A

DESIGN PARAMETERS

GENERAL PARAMETERS

Building Code 2018 IBC *

Foundation details are subject to change based on the Mfr.'s supplied reactions (Pacific Building Systems., Job # 22-8800, Dated 10/12/2022).

Use of supplied loads & reactions may not be construed as approval of their accuracy or applicability.

No analyses of the pre-engineered metal building (PEMB) members or systems have been performed.

SOILS VALUES

Bearing Pressure (Total Load) * 2000 psf

* To Be Field Verified By Geotechnical

WIND DESIGN BASIS

Wind force analysis has not been performed.

Structural Calculations are based on the Mfr.'s supplied reactions.

SEISMIC DESIGN BASIS

Seismic force analysis of the PEMB has not been performed.

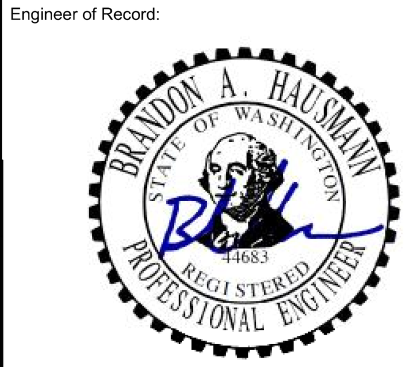
Structural Calculations are based on the Mfr.'s supplied reactions.

* *The 2018 International Building Code (IBC) is the governing code in the State of Washington.*

SHEET INDEX

ALPINE ENGINEERING, LLC
203 W. Chestnut
Bellingham, WA 98225
(360) 200-8703
CIVIL • STRUCTURAL
www.alpineengineer.com

Engineer of Record:



ABC Recycling
Building 3 & 4 Reclamation
741 Marine Drive
Bellingham, Washington

Revision:

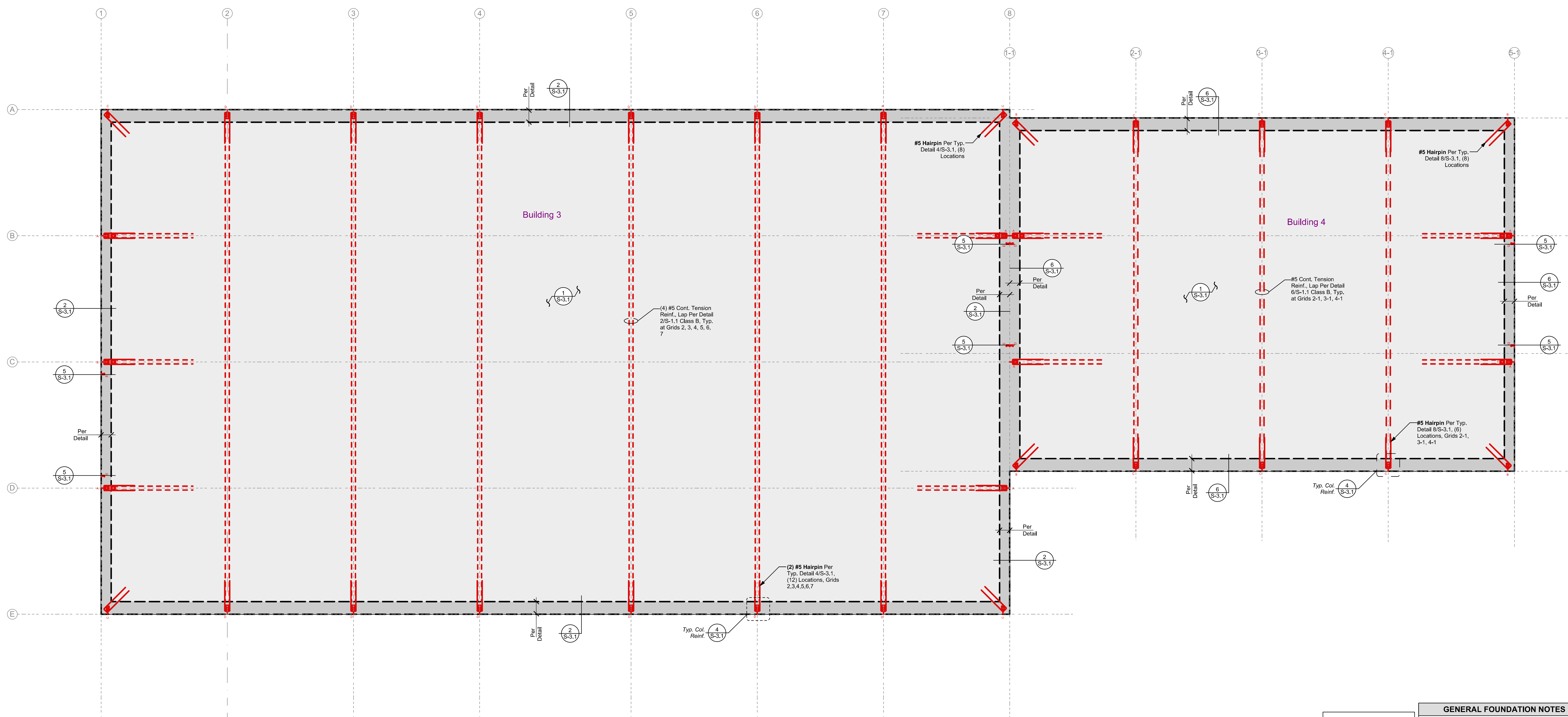
△	
△	
△	
△	
△	
△	
△	

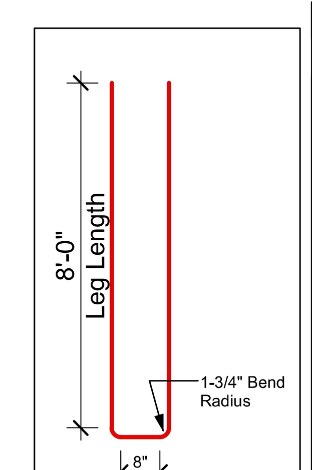
Proj. Engr.: S. Williamson
Proj. Mngr.: B. Hausmann
Date: 05 Oct. 2023 | Scale: NTS
Alpine Eng. Job No.: No. 20004

STRUCTURAL TITLE SHEET

S-1.1

DO NOT SCALE THESE DRAWINGS. Refer to Architectural plans for all dimensions.





Hairpin Reinf. - #5(UNO)

SHEAR TIE GRID LOCATIONS	
Grid	Tie Spacing & Range
A-2,3,4,5,6,7	6" o.c., 3'-0" Ea. Side AB
E-2,3,4,5,6,7	6" o.c., 3'-0" Ea. Side AB
A1- 2-1,3-1,4-1	7" o.c., 2'-0" Ea. Side AB
D1- 2-1,3-1,4-1	7" o.c., 2'-0" Ea. Side AB

Note: All Shear Ties to be #3

GENERAL FOUNDATION NOTES

Please see Geotech Recommendations for additional specifications and recommendations. It is the contractor's responsibility to obtain a copy of all geotech info. from the owner or owners representative.

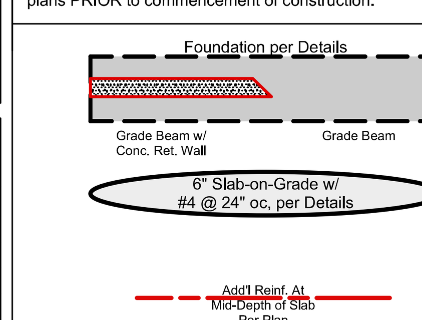
Prior to the contractor requesting a Building Department foundation inspection, the Soils Engineer shall advise the building inspector in writing that:

a) Building pad was prepared in accordance with recommdations
b) Utility trenches have been properly backfilled and compacted, and
c) Foundation excavations, the soil's expansive characteristics and bearing capacity conform to the recommendations

See General Notes & Specifications for additional requirements and material specifications.

All dimensions per Architectural plans

Contractor to VERIFY all dimensions w/ Architectural plans PRIOR to commencement of construction.



ALPINE ENGINEERING, LLC
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Bellingham, WA 98225
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Engineer of Record:

ABC Recycling
Building 3 & 4 Reclamation
741 Marine Drive
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Revision:

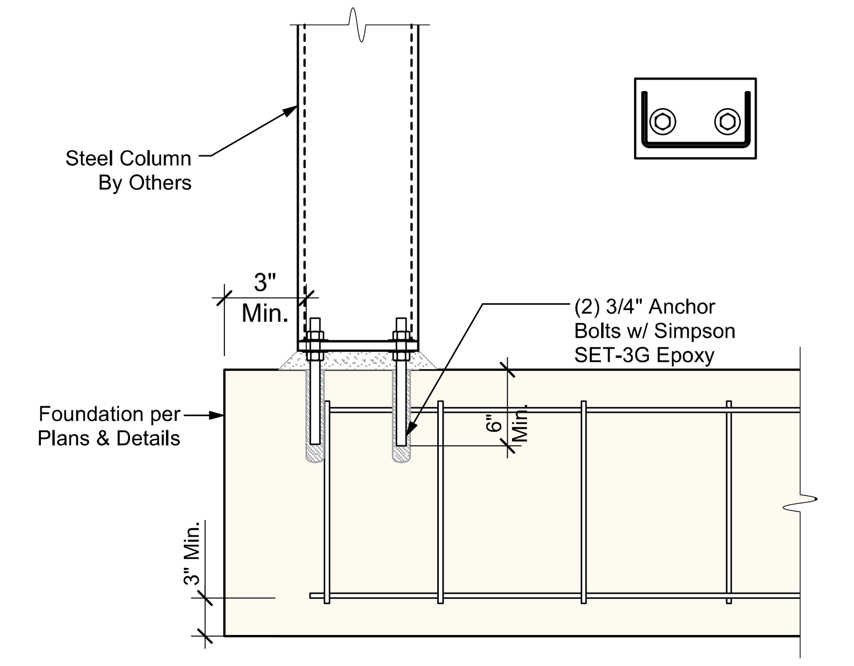
Proj. Engr.:	S. Williamson
Proj. Mngr.:	B. Hausmann
Date: 05 Oct. 2023	Scale: NTS
Alpine Eng. Job No.:	No. 20004

FOUNDATION PLAN

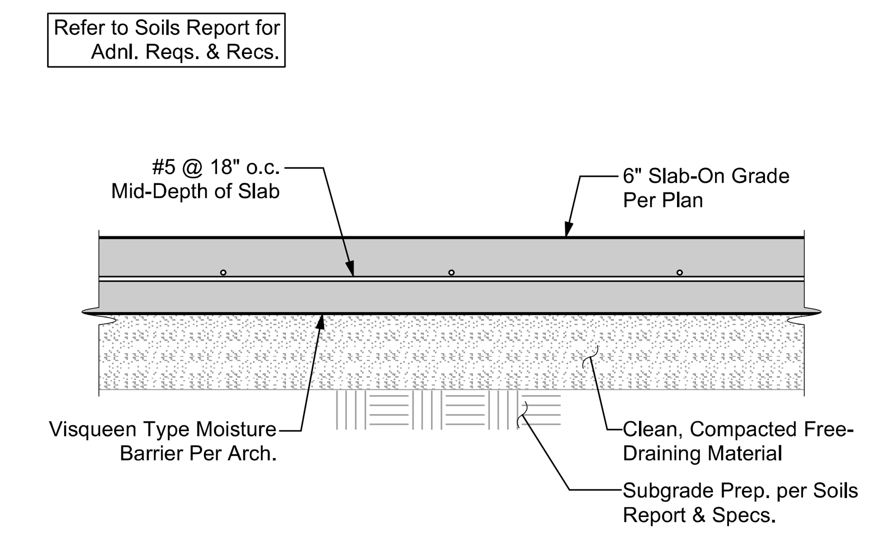
S-2.1

13

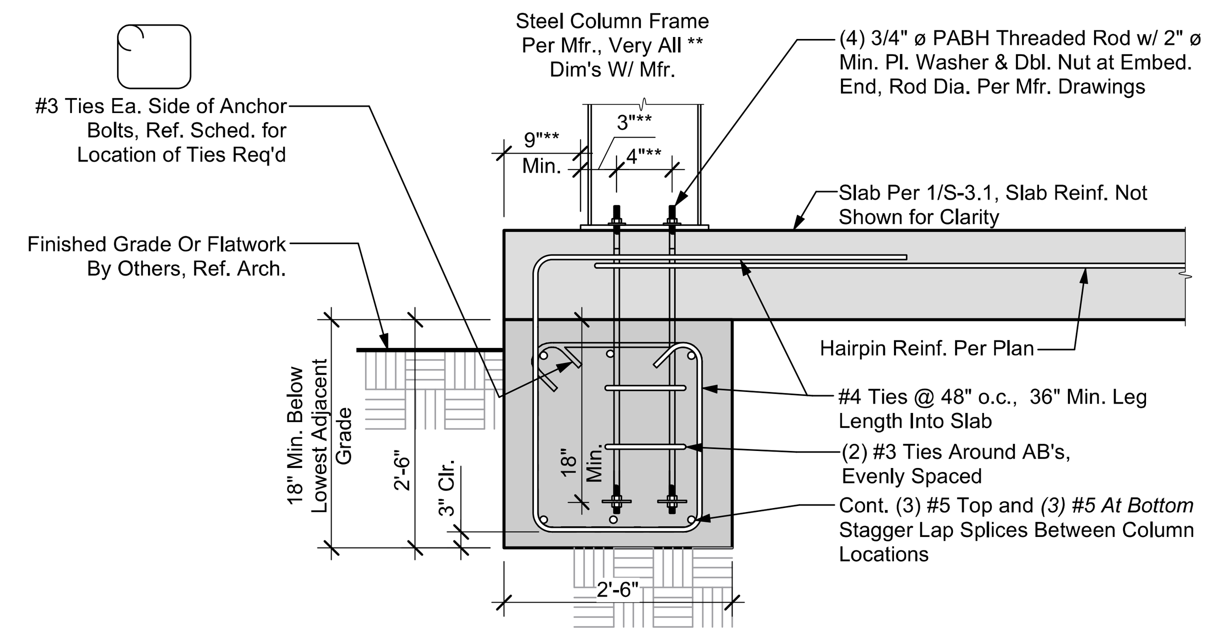
9



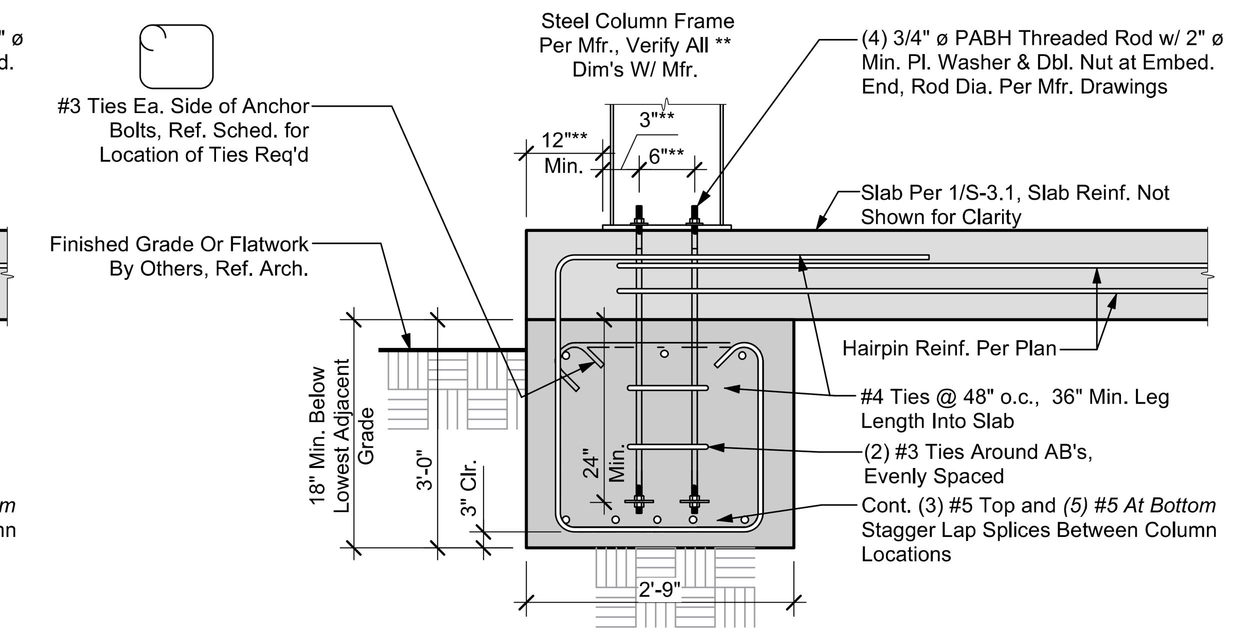
5 DOOR FRAME ANCHOR BOLTS



1 TYPICAL SLAB ON GRADE



6 EXTERIOR GRADE BEAM FOUNDATION (BLDG 4)



2 EXTERIOR GRADE BEAM FOUNDATION

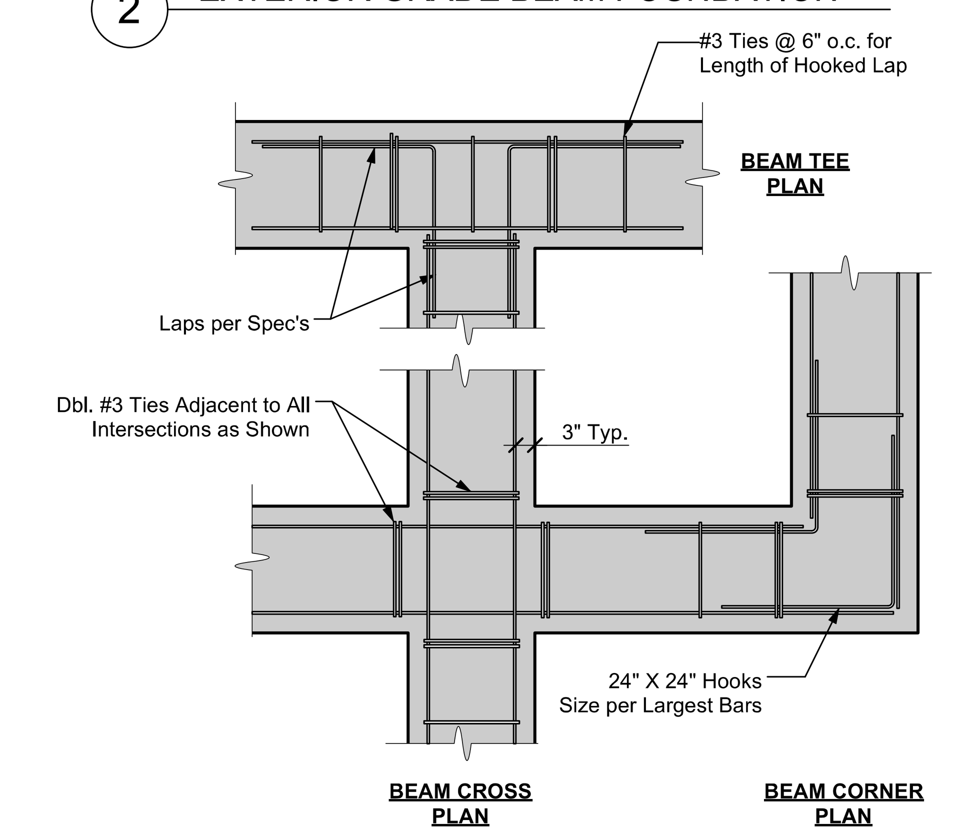
14

10

15

11

7

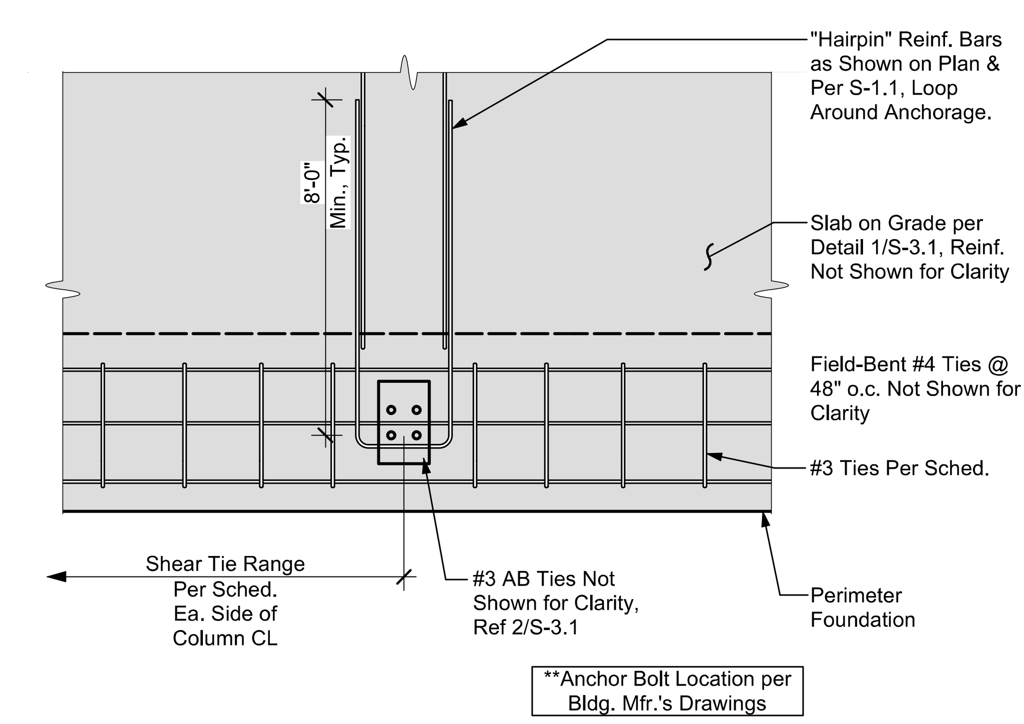


3 TYPICAL BEAM TO BEAM CONNECTIONS

16

12

8



**Anchor Bolt Location per
Bldg. Mfr.'s Drawings

4 TYPICAL PERIMETER COL. REINF. PLAN

ALPINE
ENGINEERING, LLC
203 W. Chestnut
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Engineer of Record:

BRANDON A. HAUSMANN
STATE OF WASHINGTON
44683
REGISTERED
PROFESSIONAL ENGINEER

ABC Recycling

Building 3 & 4 Reclamation

741 Marine Drive
Bellingham, Washington

Revision:

△	
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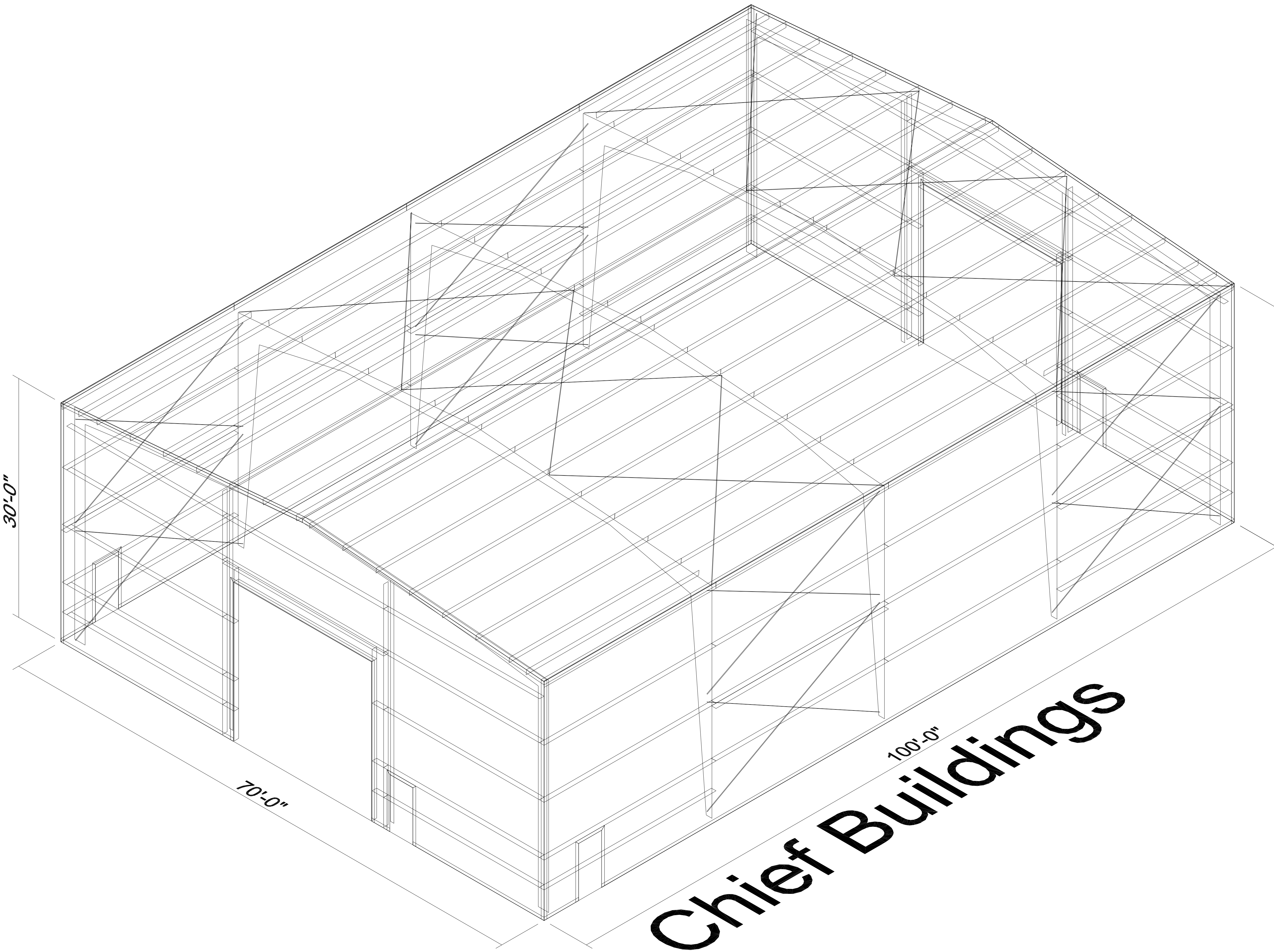
△	
△	

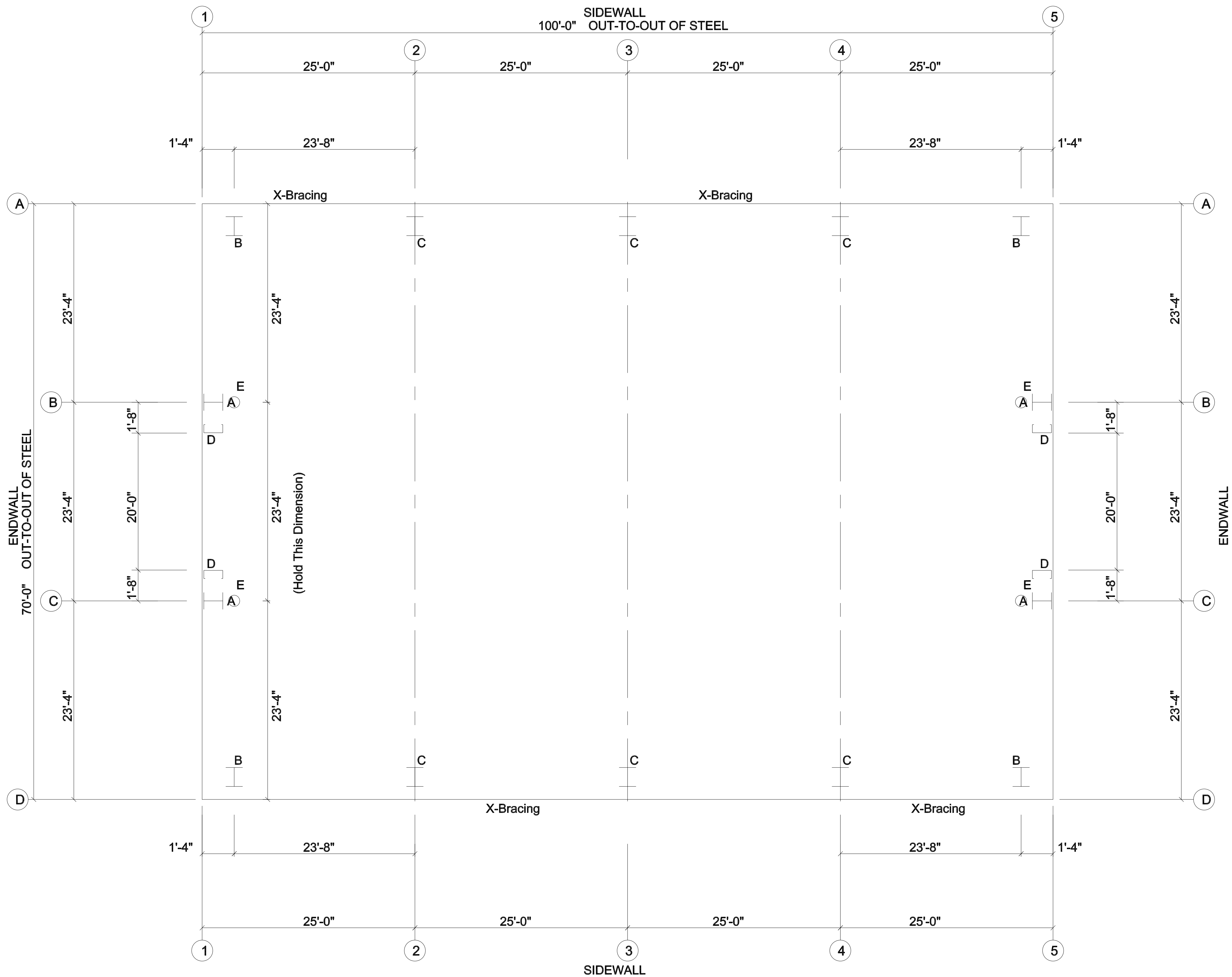
Proj. Engr.: S. Williamson	
Proj. Mngr.: B. Hausmann	
Date: 05 Oct. 2023	Scale: NTS
Alpine Eng. Job No.:	No. 20004

STRUCTURAL
DETAILS

S-3.1

DO NOT SCALE THESE DRAWINGS. Refer to Architectural plans for all dimensions.


30'-0"
30'-0"
70'-0"
100'-0"
Chief Buildings



ANCHOR ROD PLAN

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

REFERENCE NOTES:

1. All Anchor Rods including nuts and washers for same are not furnished by CHIEF BUILDINGS.
2. Anchor Rod material shall conform to ASTM F1554 having a yield of 36 KSI or greater.
3. Rod projections are recommended minimums based on the base plate bearing directly on the concrete pier. If the base plate is to bear on grout, the rod projection must be increased accordingly.
4. Concrete shall have a minimum strength of 3000 PSI.
5. ALL DRAWINGS ARE NOT TO SCALE.
6. Anchor Rod Summary Table
   - Quantity includes all buildings, all phases.
   - However anchor rods for Partitions and Smart Canopies are found on separate pages (when applicable).

ANCHOR ROD SUMMARY

	Qty	Locate	Dia (in)	Type	Proj (in)
●	8	Jamb	1/2"	F1554	1.50
⊕	16	Endwall	3/4"	F1554	2.00
⊕	56	Frame	3/4"	F1554	2.00

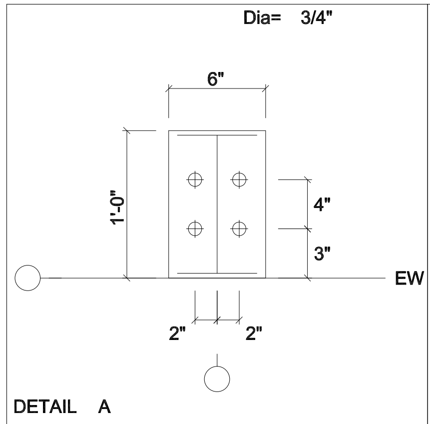
PRELIMINARY

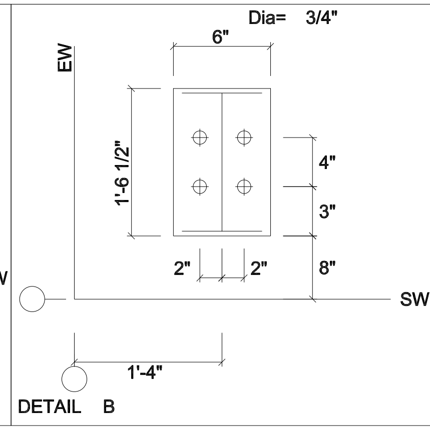
- Preliminary drawings for sales and estimating purposes only.
- Subject to change during order process.

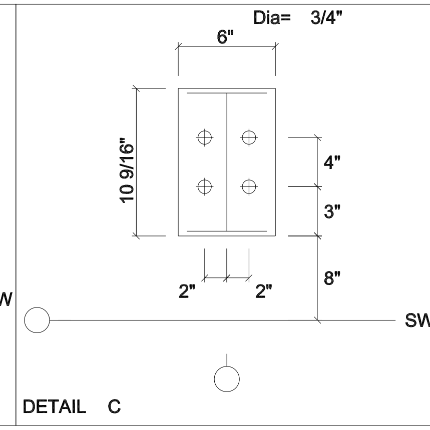
NOT FOR CONSTRUCTION

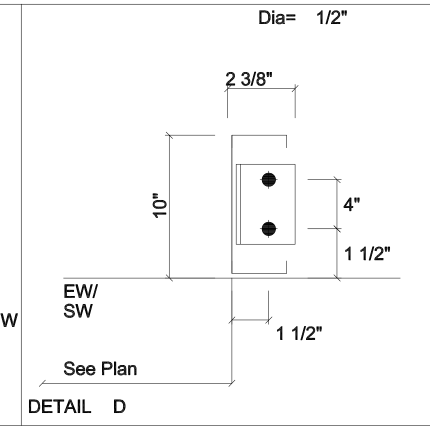
Drawing	ANCHOR ROD
Buyer	Steel Buildings Northwest, Inc
Customer	ABC Recycling Bellingham, WA 98225
Project Name	ABC Recycling - bldg 4

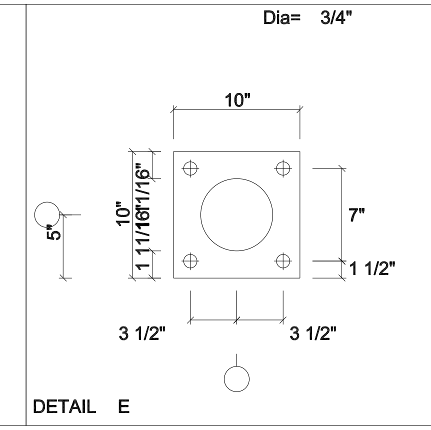
CHIEF BUILDINGS	DATE DRAWN	QUOTE NO.
	8/25/23	FQ74901A







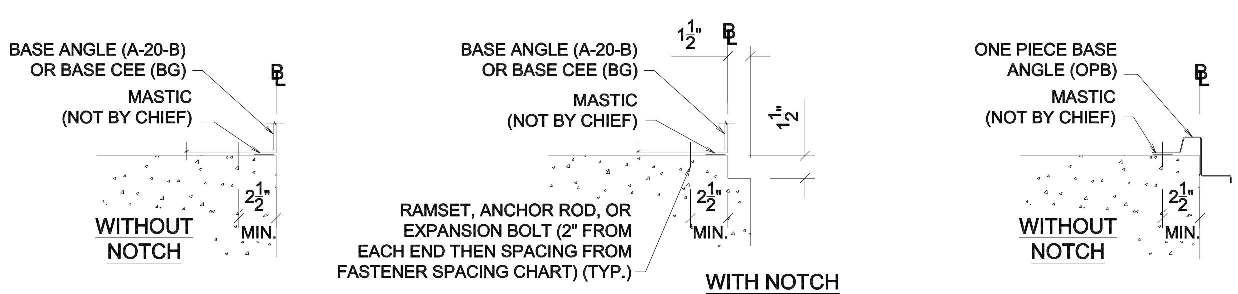




BASE ANCHORAGE SPACING FOR STANDARD BASE ANGLE, BASE CEE OR ONE PIECE BASE WITH CS OR AP WALLS		
FASTENER TYPE & DIAMETER	MINIMUM EMBEDMENT	MAXIMUM SPACING
1/4" WEDGE ANCHOR (1)	1 1/4"	3'-0"
1/4" SCREW TYPE ANCHOR (2)	1 1/2"	3'-0"
3/8" CAST-IN ANCHOR	4" WITH HOOK OR HEAD	3'-0"
1/4" HAMMER-IN (3)	1 3/8"	2'-0"
0.14 POWDER ACTUATED (4)	1 1/4"	1'-6"

1. HILTI KWIK BOLT®, RAMSET TRUBOLT®, POWERS POWERSTUD®, OR EQUAL
2. CFS TAPCON®, HILTI KWIK-CON II®, POWERS WEDGE-BOLT®, OR EQUAL
3. POWERS ZAMAC HAMMER SCREW®, HILTI METAL HIT ANCHOR®, OR EQUAL
4. POWERS BALLISTIC POINT PIN, RAMSET 1500/1600 SERIES, HILTI UNIVERSAL NAIL OR EQUAL

FASTENER SPACING CHART



BASE MEMBER DETAILS

CONTRACTOR IS RESPONSIBLE FOR ANCHORING BASE MEMBER TO CONCRETE.

REFERENCE NOTES:

1. ACTUAL BASE PLATE DIMENSIONS MAY BE SMALLER THAN BASE PLATE DIMENSIONS SHOWN.

PRELIMINARY

- Preliminary drawings for sales and estimating purposes only.
- Subject to change during order process.

NOT FOR CONSTRUCTION

Drawing	ANCHOR ROD
Buyer	Steel Buildings Northwest, Inc
Customer	ABC Recycling Bellingham, WA 98225
Project Name	ABC Recycling - bldg 4
DATE DRAWN	8/25/23
QUOTE NO.	FQ74901A

CHIEF BUILDINGS

RIGID FRAME: BASIC COLUMN REACTIONS (k)

Frame Line	Column Line	-----Dead---- Horiz	Vert	--Collateral- Horiz	Vert	-----Live---- Horiz	Vert	-----Snow---- Horiz	Vert	--Wind_Left1- Horiz	Vert	-Wind_Right1- Horiz	Vert
1*	A	0.0	1.1	0.0	0.5	0.1	1.8	0.2	2.6	-4.9	-9.1	5.2	0.8
1*	D	0.0	1.1	0.0	0.5	-0.1	1.8	-0.2	2.6	-5.2	0.8	4.9	-9.1
1*	B	0.0	1.5	0.0	0.9	0.0	3.7	0.0	5.4	0.0	-4.5	0.0	-11.2
1*	C	0.0	1.5	0.0	0.9	0.0	3.7	0.0	5.4	0.0	-11.2	0.0	-4.5

Frame Line	Column Line	--Wind_Left2- Horiz	Vert	-Wind_Right2- Horiz	Vert	--Wind_Long1- Horiz	Vert	--Wind_Long2- Horiz	Vert	-Seismic_Left Horiz	Vert	Seismic_Right Horiz	Vert
1*	A	-6.5	-7.0	3.7	3.0	2.8	-11.4	2.5	-10.7	-0.7	-1.1	0.7	1.1
1*	D	-3.7	3.0	6.5	-7.0	-2.5	-10.7	-2.8	-11.4	-0.7	1.1	0.7	-1.1
1*	B	0.0	-2.0	0.0	-8.7	0.0	-6.7	0.0	-3.4	0.0	1.4	0.0	-1.4
1*	C	0.0	-8.7	0.0	-2.0	0.0	-3.4	0.0	-6.7	0.0	-1.4	0.0	1.4

Frame Line	Column Line	-Seismic_Long Horiz	Vert	-MIN_SNOW-- Horiz	Vert	F1PAT_LL_1- Horiz	Vert	F1PAT_LL_2- Horiz	Vert	F1PAT_LL_3- Horiz	Vert	F1PAT_LL_4- Horiz	Vert
1*	A	0.0	-3.6	0.2	3.0	0.0	1.6	0.0	-0.1	0.2	2.1	-0.1	-0.3
1*	D	0.0	-3.6	-0.2	3.0	0.0	-0.1	0.0	1.6	-0.2	2.1	0.1	-0.3
1*	B	0.0	0.0	0.0	6.2	0.0	4.1	0.0	1.8	0.0	1.6	0.0	2.2
1*	C	0.0	0.0	0.0	6.2	0.0	1.8	0.0	4.1	0.0	1.6	0.0	2.2

Frame Line	Column Line	F1UNB_SL_L- Horiz	Vert	F1UNB_SL_R- Horiz	Vert
1*	A	0.1	2.5	0.1	0.8
1*	D	-0.1	0.8	-0.1	2.5
1*	B	0.0	7.3	0.0	2.2
1*	C	0.0	2.2	0.0	7.3

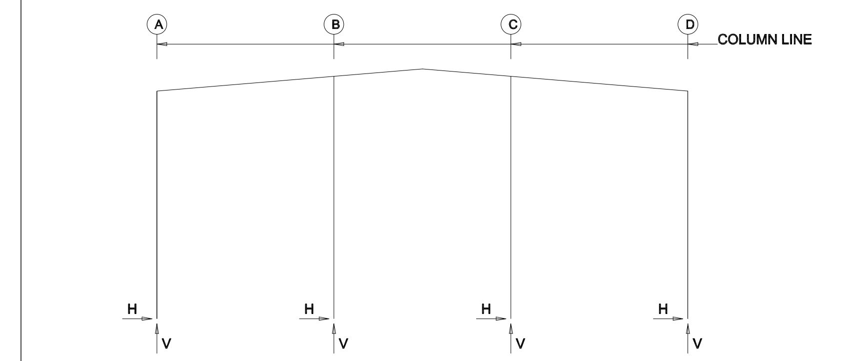
Frame Line	Column Line	-----Dead---- Horiz	Vert	--Collateral- Horiz	Vert	-----Live---- Horiz	Vert	-----Snow---- Horiz	Vert	--Wind_Left1- Horiz	Vert	-Wind_Right1- Horiz	Vert
2*	A	1.1	3.6	1.0	2.6	4.0	10.5	5.9	15.3	-12.3	-22.3	1.6	-12.4
2*	D	-1.1	3.6	-1.0	2.6	-4.0	10.5	-5.9	15.3	-1.6	-12.4	12.3	-22.3

Frame Line	Column Line	--Wind_Left2- Horiz	Vert	-Wind_Right2- Horiz	Vert	--Wind_Long1- Horiz	Vert	--Wind_Long2- Horiz	Vert	-Seismic_Left Horiz	Vert	Seismic_Right Horiz	Vert
2*	A	-12.6	-13.5	1.3	-3.6	0.1	-26.0	-0.5	-22.6	-1.3	-1.1	1.3	1.1
2*	D	-1.3	-3.6	12.6	-13.5	0.5	-22.6	-0.1	-26.0	-1.3	1.1	1.3	-1.1

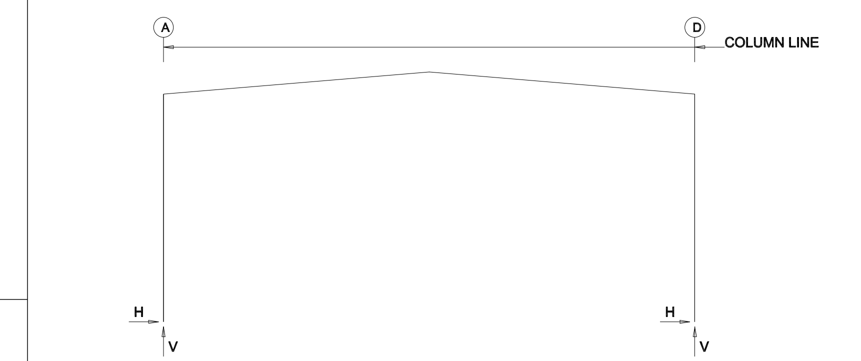
Frame Line	Column Line	-Seismic_Long Horiz	Vert	-MIN_SNOW-- Horiz	Vert	F2UNB_SL_L- Horiz	Vert	F2UNB_SL_R- Horiz	Vert
2*	A	0.0	-3.6	6.7	17.5	5.0	15.4	5.0	8.8
2*	D	0.0	-3.6	-6.7	17.5	-5.0	8.8	-5.0	15.4

1* Frame lines: 1 5
2* Frame lines: 2 3 4

FRAME LINES: 1 5



FRAME LINES: 2 3 4



CONTROLLING LOAD CASES

1. Dead+0.6Wind_Left1
2. Dead+0.6Wind_Right1
3. Dead+Collateral+0.75Snow+0.45Wind_Long1R+0.75Slide_Snow
4. Dead+Collateral+0.75Snow+0.45Wind_Long2R+0.75Slide_Snow
5. 0.6Dead+0.6Wind_Left1
6. 0.6Dead+0.6Wind_Right1
7. 0.6Dead+0.6Wind_Left2
8. 0.6Dead+0.6Wind_Right2
9. 0.6Dead+0.6Wind_Long1L
10. 0.6Dead+0.6Wind_Long2L
11. 1.07Dead+1.07Collateral+0.7Seismic_LongR
12. Dead+Collateral+MIN_SNOW
13. Dead+Collateral
14. 0.6Dead+0.6Wind_Right2+0.6Wind_Suction
15. 0.6Dead+0.6Wind_Pressure+0.6Wind_Long2L

RIGID FRAME: MAXIMUM REACTIONS

Frm Line	Col Line	Load Id	Hmax H	V Vmax	Load Id	Hmin H	V Vmin
		Column_Reactions(k)					
1*	A	2	3.2	1.6	7	-3.9	-3.5
		4	1.3	4.9	9	1.7	-6.2
1*	D	8	3.9	-3.5	1	-3.2	1.6
		3	-1.3	4.9	10	-1.7	-6.2
1*	B	6	0.0	-5.8	6	0.0	-5.8
		13	0.0	9.7			
1*	C	5	0.0	-5.8	5	0.0	-5.8
		13	0.0	9.7			

1* Frame lines: 1 5

RIGID FRAME: MAXIMUM REACTIONS

Frm Line	Col Line	Load Id	Hmax H	V Vmax	Load Id	Hmin H	V Vmin
		Column_Reactions(k)					
2*	A	12	8.9	23.7	7	-6.9	-5.9
					9	0.7	-13.5
2*	D	8	6.9	-5.9	12	-8.9	23.7
		12	-8.9	23.7	10	-0.7	-13.5

2* Frame lines: 2 3 4

BUILDING BRACING REACTIONS

Wall Loc	Wall Line	Col Line	± Reactions(k) Wind Horz	Wind Vert	Seismic Horz	Seismic Vert	Panel_Shear (lb/ft) Wind	Seis	Note
L_EW	1								(h)
F_SW	D	2,3	5.8	6.6	3.0	3.4			
		4,5	5.8	6.9	3.0	3.6			
R_EW	5								(h)
B_SW	A	4,3	5.8	6.6	3.0	3.4			
		2,1	5.8	6.9	3.0	3.6			

(h)Rigid frame at endwall

Reactions for seismic represent shear force, Eh

ENDWALL COLUMN: BASIC COLUMN REACTIONS (k)

Frm Line	Col Line	Dead Vert	Wind Press Horz	Wind Suct Horz	Seis Long Horz
1	B	0.5	-8.8	9.7	0.2
1	C	0.5	-8.8	9.7	0.2
5	C	0.5	-8.8	9.7	0.2
5	B	0.5	-8.8	9.7	0.2

ENDWALL COLUMN: MAXIMUM REACTIONS

Frm Line	Col Line	Load Id	Hmax H	V Vmax	Load Id	Hmin H	V Vmin
		Column_Reactions(k)					
1	B	14	5.8	0.3	15	-5.3	0.3
		11	-0.1	0.5			
1	C	14	5.8	0.3	15	-5.3	0.3
		11	-0.1	0.5			
5	C	14	5.8	0.3	15	-5.3	0.3
		11	-0.1	0.5			
5	B	14	5.8	0.3	15	-5.3	0.3
		11	-0.1	0.5			

1. COLUMN FOOTINGS AND PIERS MUST BE DESIGNED TO WITHSTAND HORIZONTAL AND VERTICAL REACTIONS AS SHOWN ON THE ANCHOR ROD PLAN. CHIEF BUILDINGS IS NOT RESPONSIBLE FOR DESIGN OF CONCRETE FOUNDATION. CHIEF BUILDINGS RECOMMENDS THAT THE SERVICES OF A QUALIFIED ENGINEER IS OBTAINED BY THE CONTRACTOR / BUILDER TO DESIGN THE FOUNDATIONS FOR THE INDICATED REACTIONS.

2. REACTIONS ARE GIVEN IN KIPS. (1 KIP = 1000 LBS.) MOMENTS, IF ANY, ARE GIVEN IN KIP-FT.

3. ANCHOR ROD DESIGN IS BASED ON SHEAR, TENSION, AND COMBINED TENSION AND SHEAR. CHIEF BUILDINGS IS NOT RESPONSIBLE FOR ANCHOR ROD SIZE RECOMMENDATIONS WHEN ANCHOR ROD CONFIGURATION PLACES THE RODS IN A BENDING MODE. WHEN THE COLUMN BASE PLATE BEARS ON GROUT, THE CONTRACTOR / BUILDER OR FOUNDATION ENGINEER SHALL INVESTIGATE BENDING IN THE ANCHOR RODS AND PROVIDE A SHEAR KEY FOR THE COLUMN BASE TO THE PIER WHEN THE ANCHOR RODS ARE NOT ADEQUATE IN BENDING ABOUT THE PIER.

DESCRIPTIONS OF REACTION ABBREVIATIONS

[redacted]	[redacted]
DL	DEAD
CL OR COLL	COLLATERAL
LL	LIVE
SL	SNOW
DRIFT	SNOW DRIFT
SLIDE	SLIDING SNOW
WL1 OR WIND_L1	WIND 1 LEFT (WITH POSITIVE INTERNAL PRESSURE, +GCPI)
WR1 OR WIND_ R1	WIND 1 RIGHT (WITH POSITIVE INTERNAL PRESSURE, +GCPI)
WL2 OR WIND_L2	WIND 2 LEFT (WITH NEGATIVE INTERNAL PRESSURE, -GCPI)
WR2 OR WIND_R2	WIND 2 RIGHT (WITH NEGATIVE INTERNAL PRESSURE, -GCPI)
LW1 OR LNWIND1	LONGITUDINAL WIND, CASE 1
LW2 LNWIND2	LONGITUDINAL WIND, CASE 2
WP	WIND PRESSURE
WS	WIND SUCTION
SEISL OR SEIS_L	SEISMIC LEFT
SEISR OR SEIS_R	SEISMIC RIGHT
LNSEIS OR LN_SEISMIC	LONGITUDINAL SEISMIC
TEMP	TEMPERATURE CHANGE
LW1_L2E	LONGITUDINAL WIND, CASE 1, WIND LEFT EDGE ZONE 2E
LW1_R2E	LONGITUDINAL WIND, CASE 1, WIND RIGHT EDGE ZONE 2E
LW2_L3E	LONGITUDINAL WIND, CASE 2, WIND LEFT EDGE ZONE 3E
LW2_R3E	LONGITUDINAL WIND, CASE 2, WIND RIGHT EDGE ZONE 3E
E#PAT_LL_*	ENDWALL PATTERN LIVE (1 - LEFT, 2 - RIGHT ENDWALL)
E#PAT_SL_*	ENDWALL PATTERN SNOW (1 - LEFT, 2 - RIGHT ENDWALL)
F#PAT_LL_*	RIGID FRAME PATTERN LIVE
F#PAT_SL_*	RIGID FRAME PATTERN SNOW
E#UNB_SL_L	ENDWALL UNBALANCED SNOW LEFT
E#UNB_SL_R	ENDWALL UNBALANCED SNOW RIGHT
F#UNB_SL_L	RIGID FRAME UNBALANCED SNOW LEFT
F#UNB_SL_R	RIGID FRAME UNBALANCED SNOW RIGHT
F#CRANEA*	CRANE LOADING, SINGLE CRANE
F#CRNA2 $	A2 - TWO LARGEST CRANES IN ANY AISLE
F#CRNAM $$	AM - SIMPLE MAXIMUM SIZE IN ONE AISLE
F#CRNA $$	A - SINGLE CRANE IN ONE AISLE
F#CRNBM $	BM - LARGEST CRANE IN EACH AISLE FOR TWO ADJACENT AISLE
F#CRNC2 $	C2 - TWO CRANES IN ANY AISLE PLUS ONE CRANE IN ANY NON-ADJACENT AISLE. ALSO SINGLE CRANE AT C2 LOCATION AND DOUBLE CRANE AT OTHER LOCATION.
F#CRN B $$	B - SINGLE CRANE IN TWO ADJACENT AISLES
F#CRN C $$	C - SINGLE CRANE IN TWO NON-ADJACENT AISLES

THIS TABLE PROVIDES A DESCRIPTION OF ABBREVIATIONS FOR COMMONLY USED REACTIONS/LOADS.

PRELIMINARY

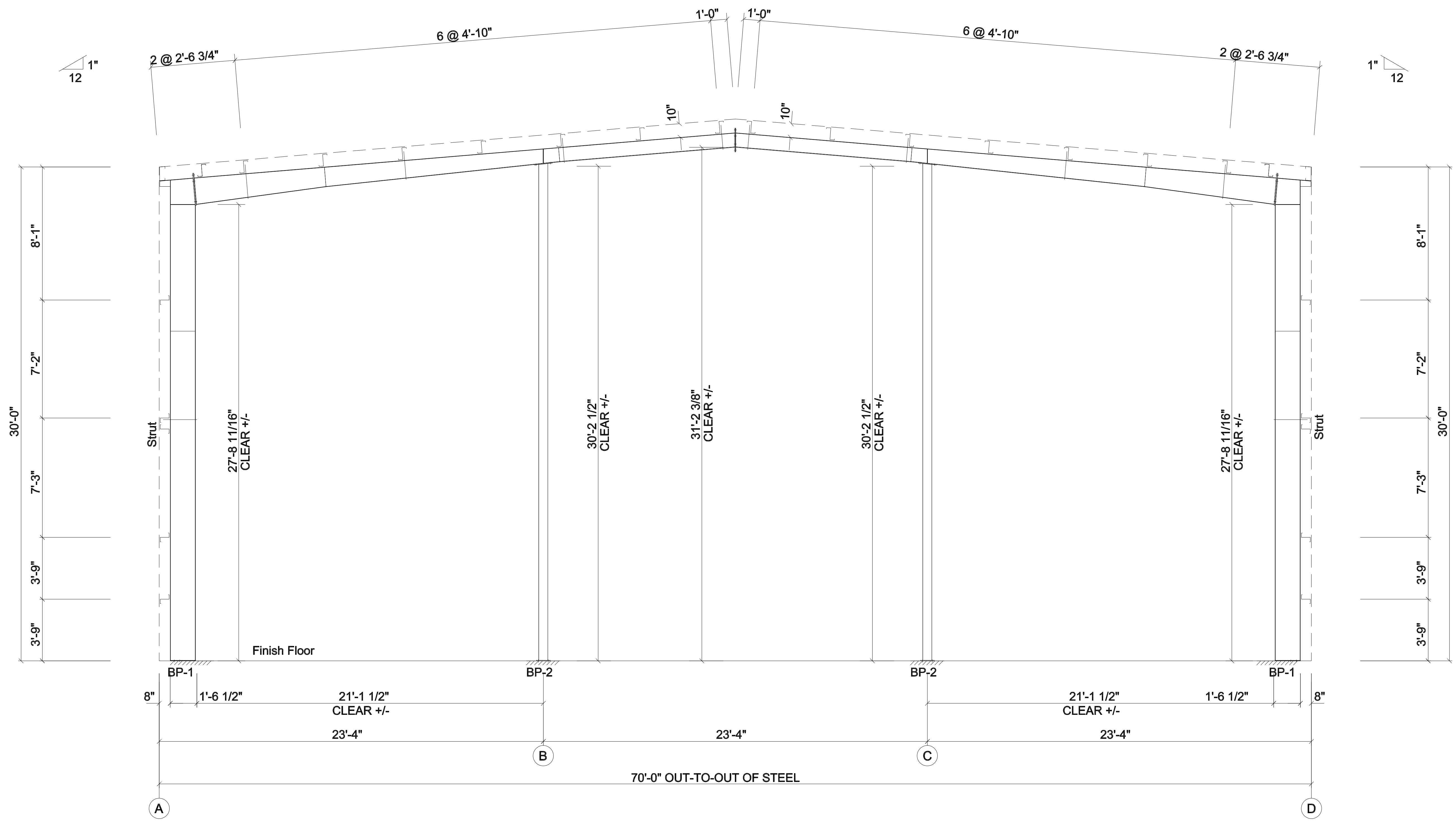
- Preliminary drawings for sales and estimating purposes only.
- Subject to change during order process.

NOT FOR CONSTRUCTION

Drawing	ANCHOR ROD
Buyer	Steel Buildings Northwest, Inc
Customer	ABC Recycling Bellingham, WA 98225
Project Name	ABC Recycling - bldg 4

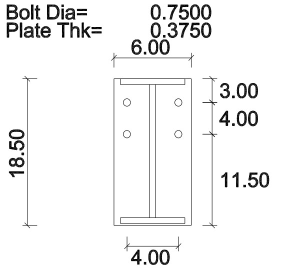
CHIEF BUILDINGS	DATE DRAWN	QUOTE NO.
	8/25/23	FQ74901A

STIFFENER TABLE				
	Stiff	Plate Size		
Mark	Mark	Width	Thick	Length
RF1-1	ST1	2.750	0.250	17.94
RF1-2	ST2	2.750	0.250	10.31



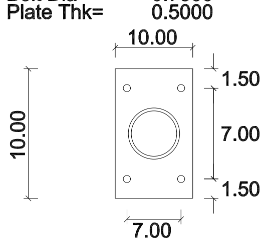
RIGID FRAME ELEVATION: FRAME LINE 1 5

Bolt Dia= 0.7500
Plate Thk= 0.3750



BP-1

Bolt Dia= 0.7500
Plate Thk= 0.5000



BP-2

PRELIMINARY

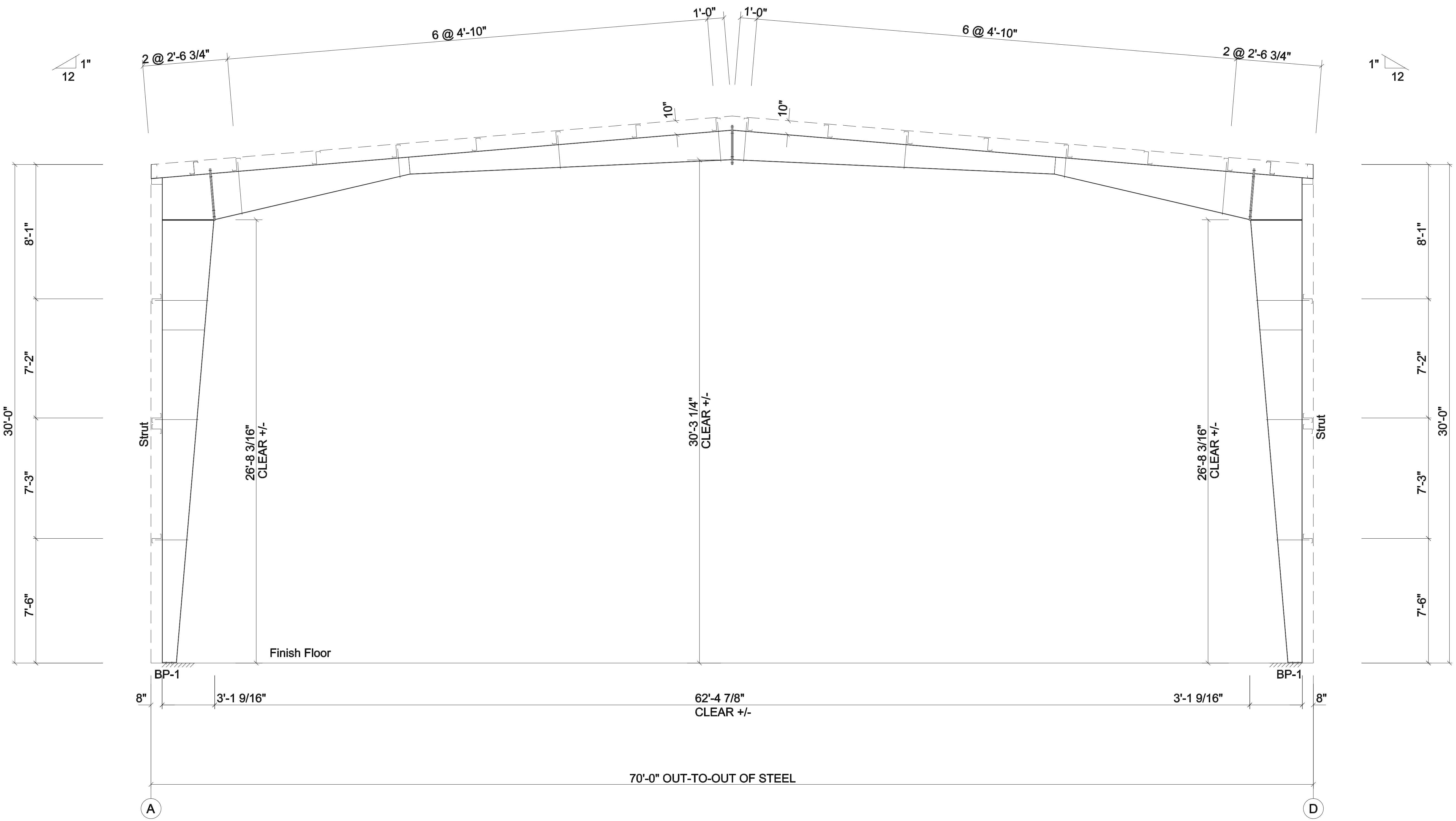
- Preliminary drawings for sales and estimating purposes only.
- Subject to change during order process.

NOT FOR CONSTRUCTION

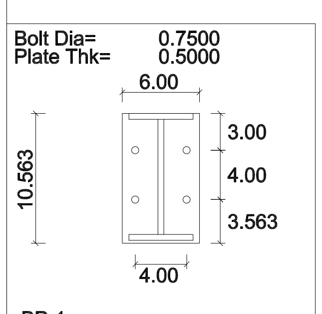
Drawing	CROSS SECTION
Buyer	Steel Buildings Northwest, Inc
Customer	ABC Recycling Bellingham, WA 98225
Project Name	ABC Recycling - bldg 4

CHIEF BUILDINGS	DATE DRAWN	QUOTE NO.
	8/25/23	FQ74901A

STIFFENER TABLE				
Mark	Stiff Mark	Plate Size Width	Thick	Length
RF2-1	ST1	2.750	0.250	36.94



RIGID FRAME ELEVATION: FRAME LINE 2 3 4



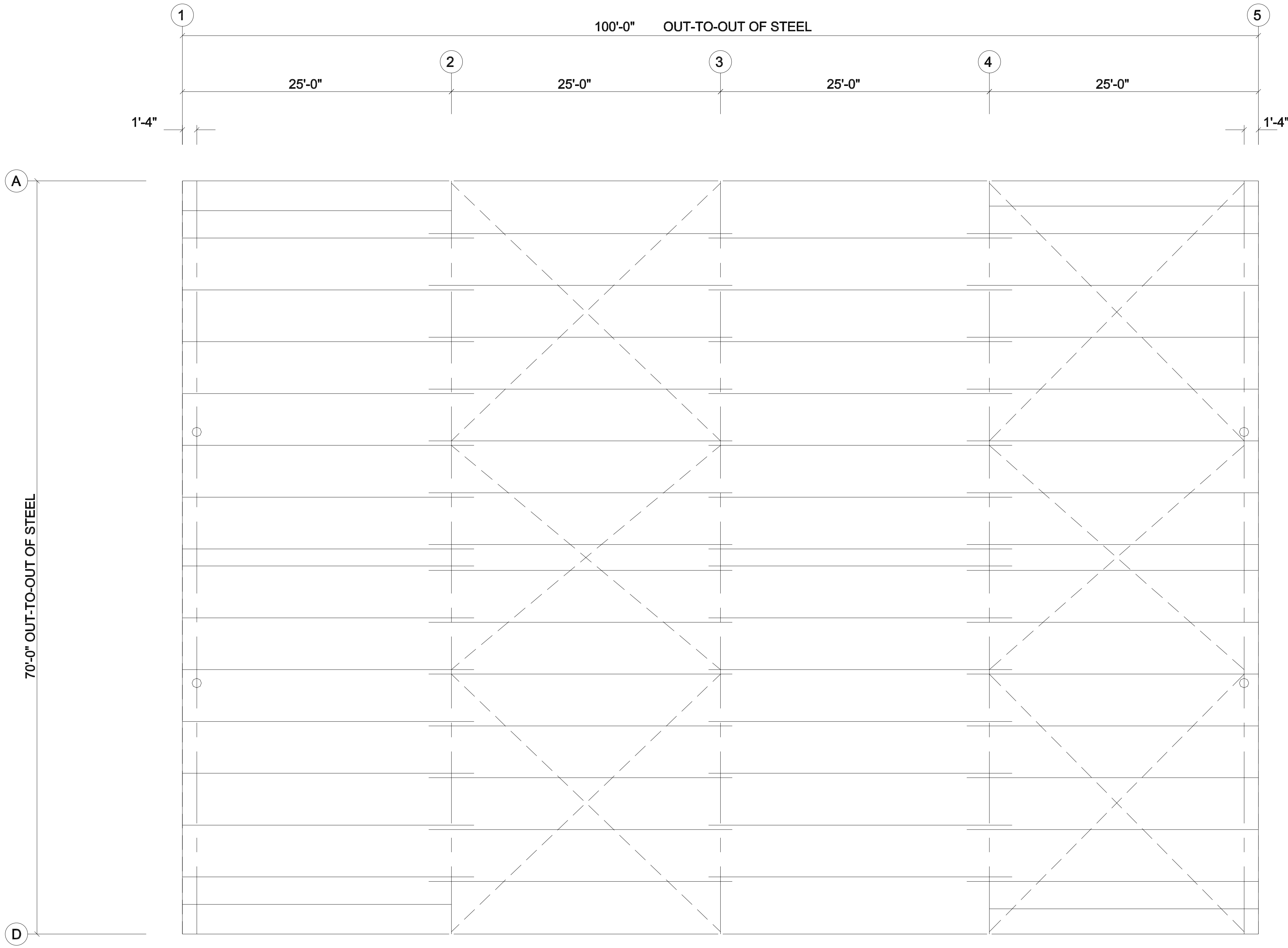
PRELIMINARY

- Preliminary drawings for sales and estimating purposes only.
- Subject to change during order process.

NOT FOR CONSTRUCTION

Drawing	CROSS SECTION
Buyer	Steel Buildings Northwest, Inc
Customer	ABC Recycling Bellingham, WA 98225
Project Name	ABC Recycling - bldg 4
DATE DRAWN	8/25/23
QUOTE NO.	FQ74901A

CHIEF BUILDINGS



ROOF FRAMING PLAN

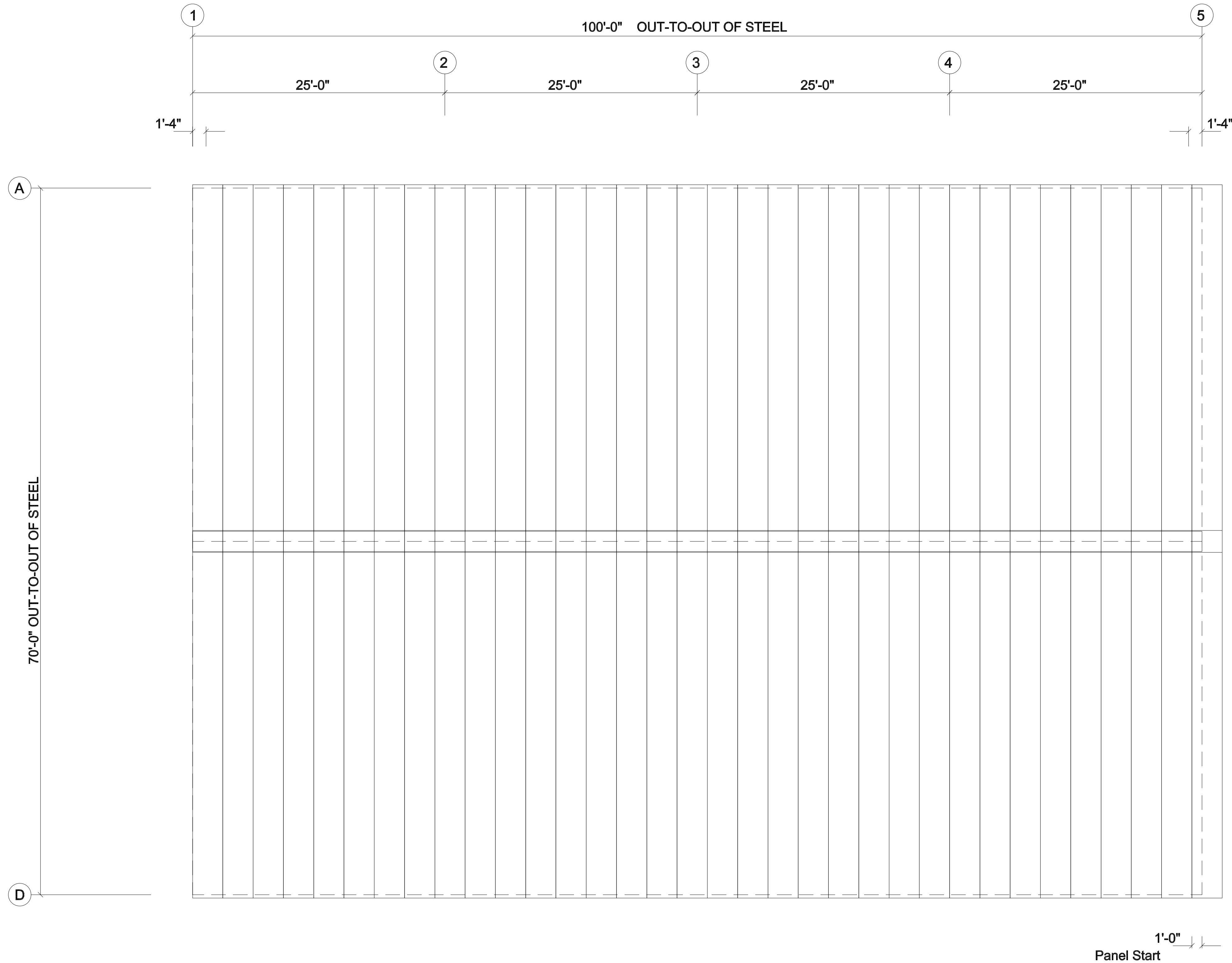
PRELIMINARY

- Preliminary drawings for sales and estimating purposes only.
- Subject to change during order process.

NOT FOR CONSTRUCTION

Drawing	ROOF FRAMING
Buyer	Steel Buildings Northwest, Inc
Customer	ABC Recycling Bellingham, WA 98225
Project Name	ABC Recycling - bldg 4

CHIEF BUILDINGS	DATE DRAWN	QUOTE NO.
	8/25/23	FQ74901A



ROOF SHEETING PLAN

PANELS: 26 Ga. CS - Std.PVDF-FEVE Finish

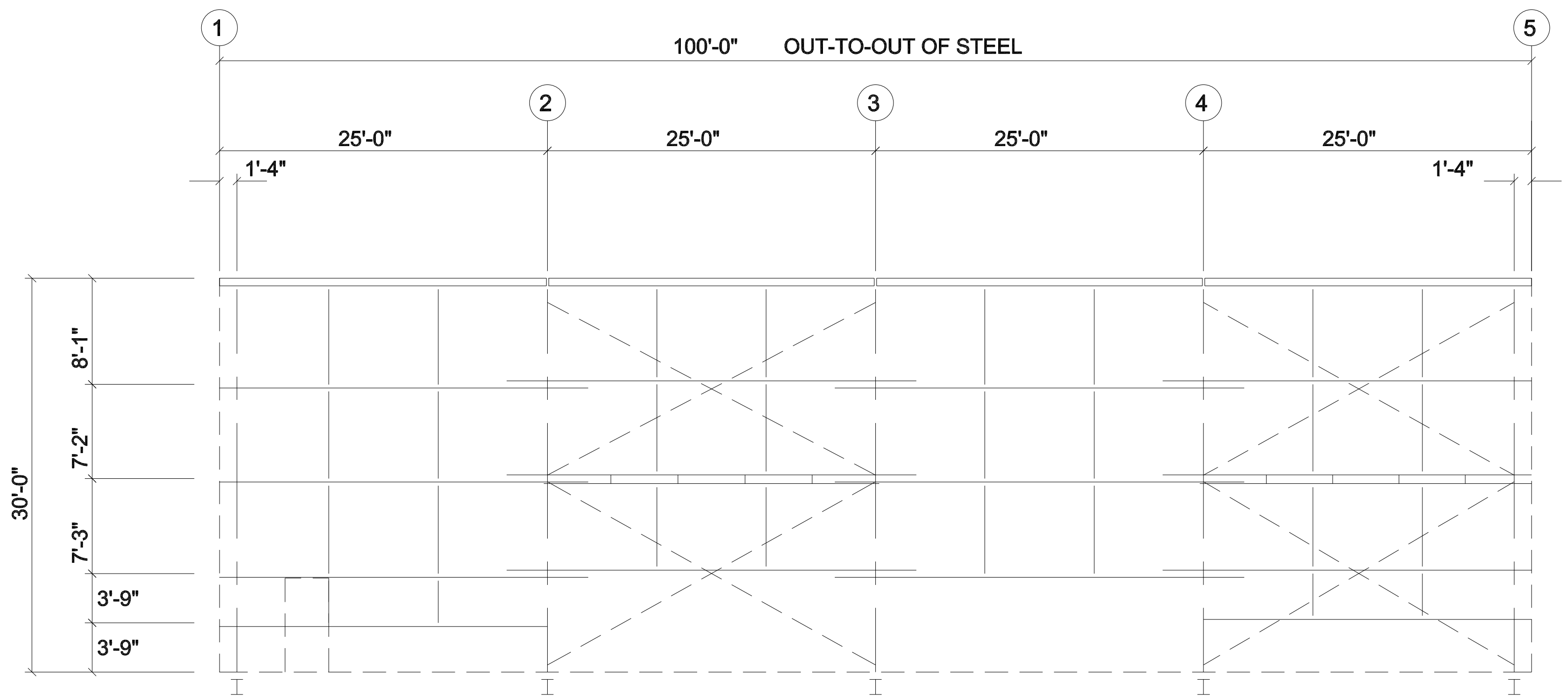
PRELIMINARY

- Preliminary drawings for sales and estimating purposes only.
- Subject to change during order process.

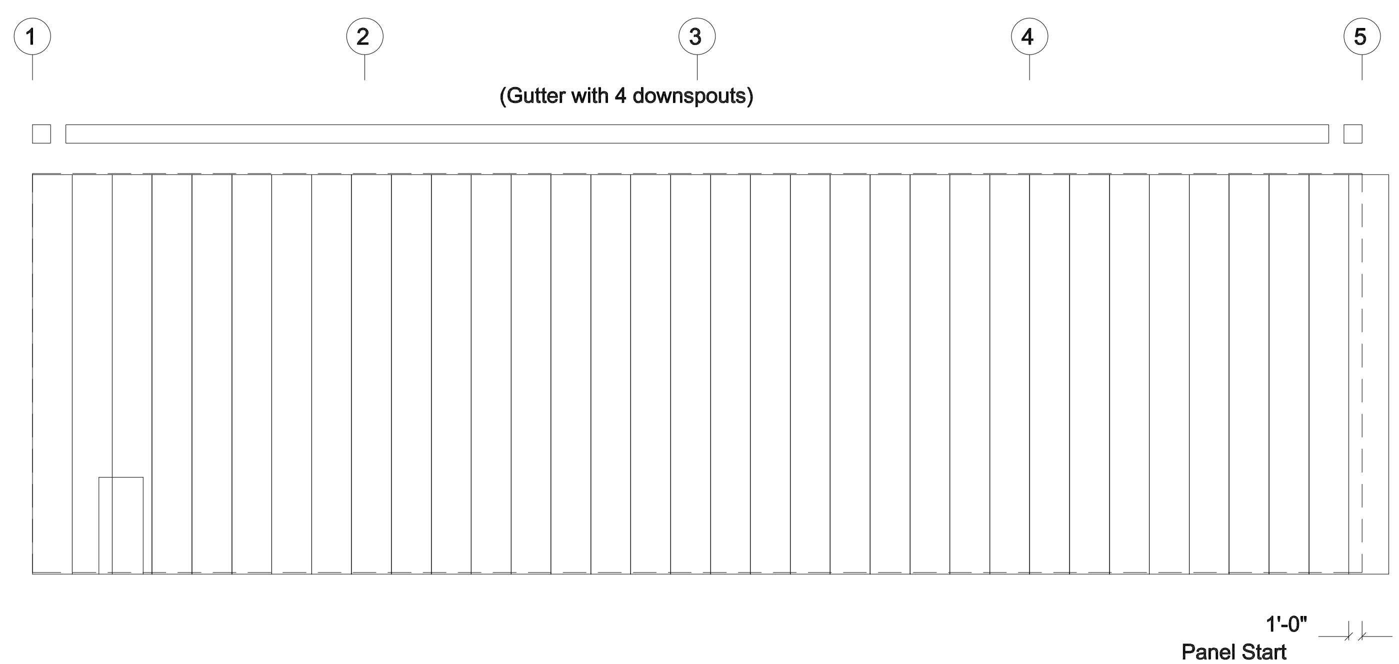
NOT FOR CONSTRUCTION

Drawing	ROOF SHEETING
Buyer	Steel Buildings Northwest, Inc
Customer	ABC Recycling Bellingham, WA 98225
Project Name	ABC Recycling - bldg 4

CHIEF BUILDINGS	DATE DRAWN	QUOTE NO.
	8/25/23	FQ74901A



SIDEWALL FRAMING: FRAME LINE D



SIDEWALL SHEETING & TRIM: FRAME LINE D

PANELS: 26 Ga. TBD - Std. SMP Finish

GIRT DEPTH: 8.00

PRELIMINARY

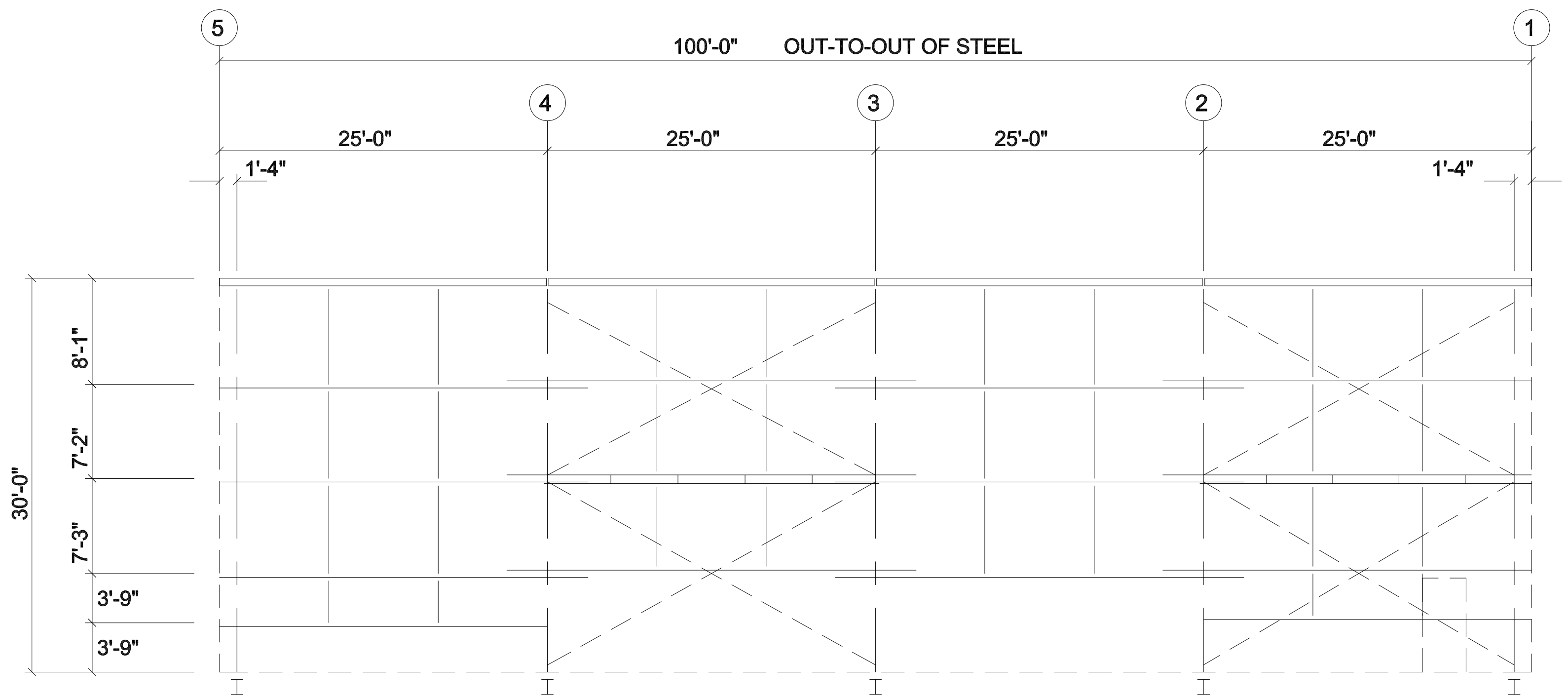
- Preliminary drawings for sales and estimating purposes only.
- Subject to change during order process.

NOT FOR CONSTRUCTION

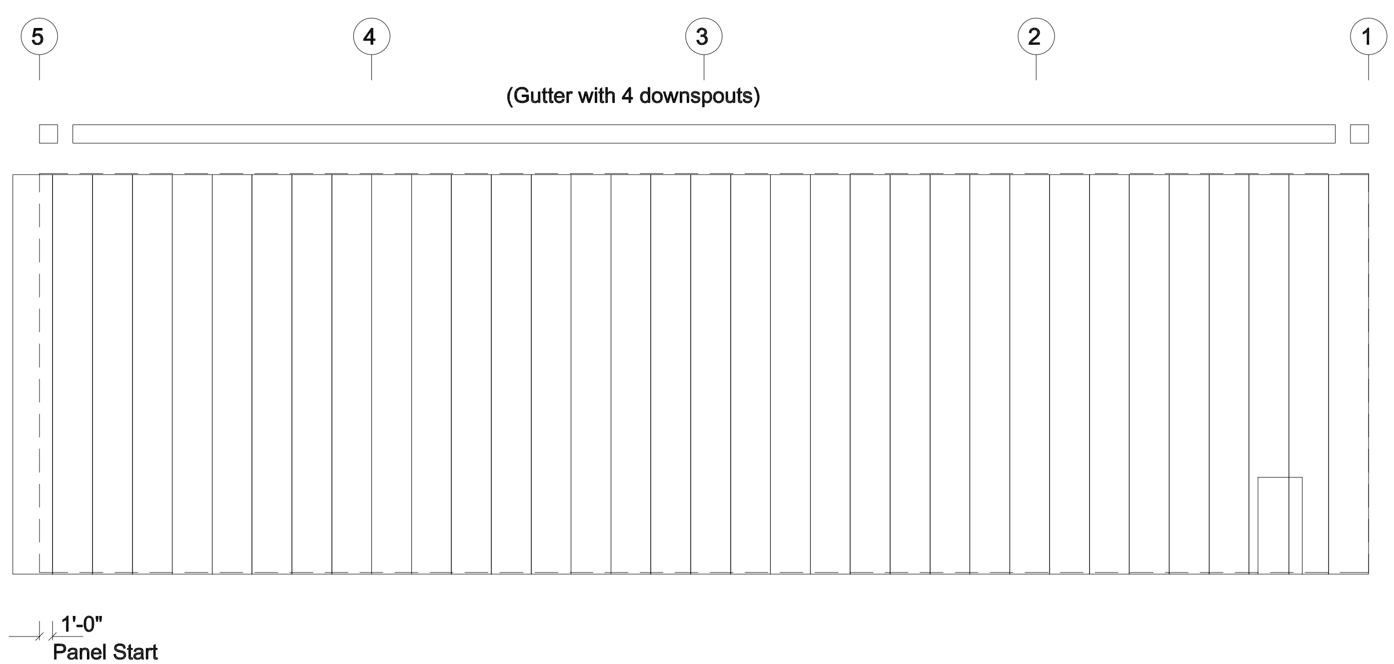
Drawing	SIDEWALL DRAWING
Buyer	Steel Buildings Northwest, Inc
Customer	ABC Recycling Bellingham, WA 98225
Project Name	ABC Recycling - bldg 4

CHIEF BUILDINGS

DATE DRAWN	QUOTE NO.
8/25/23	FQ74901A



SIDEWALL FRAMING: FRAME LINE A



SIDEWALL SHEETING & TRIM: FRAME LINE A

PANELS: 26 Ga. TBD - Std. SMP Finish

GIRT DEPTH: 8.00

PRELIMINARY

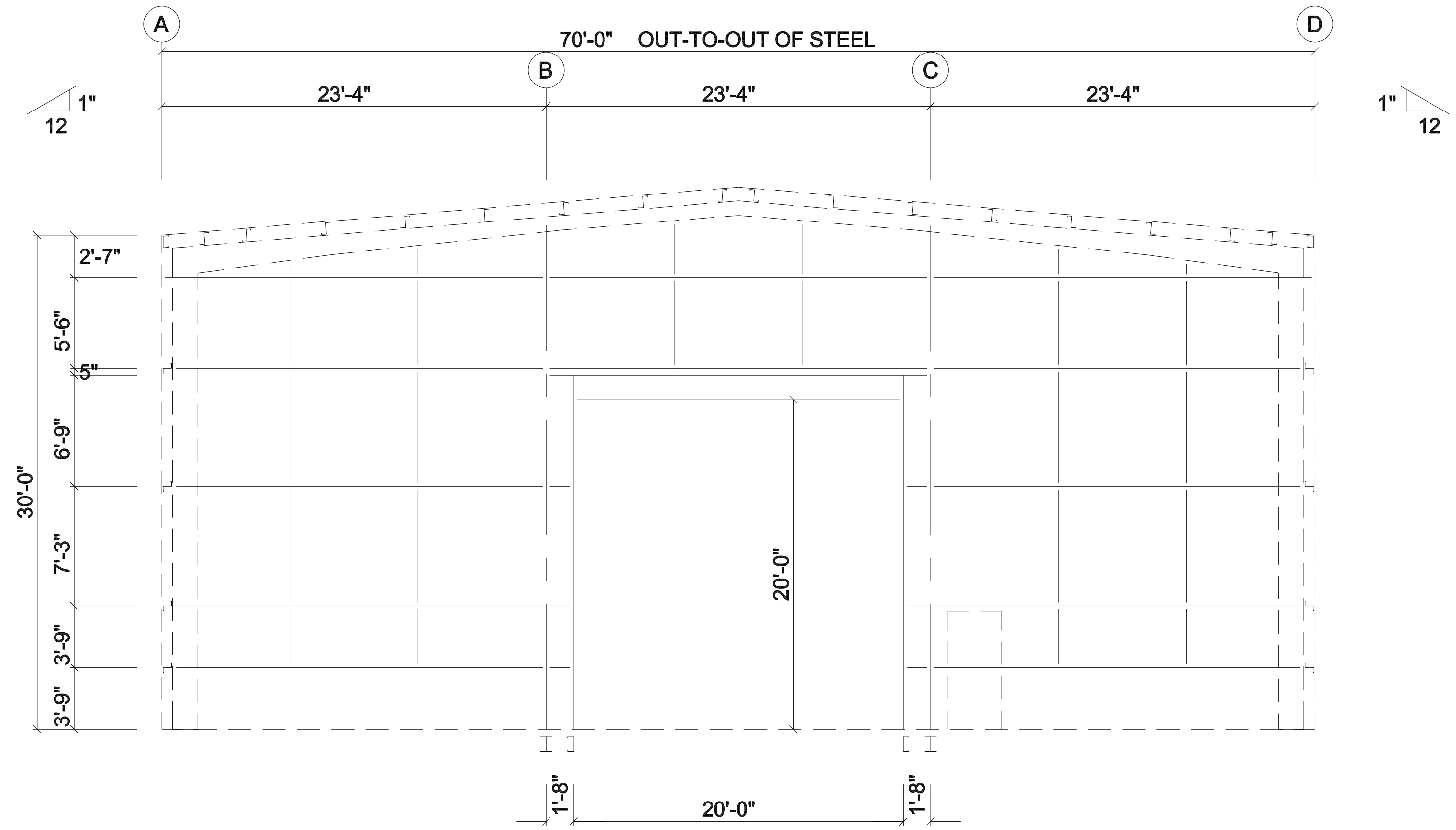
- Preliminary drawings for sales and estimating purposes only.
- Subject to change during order process.

NOT FOR CONSTRUCTION

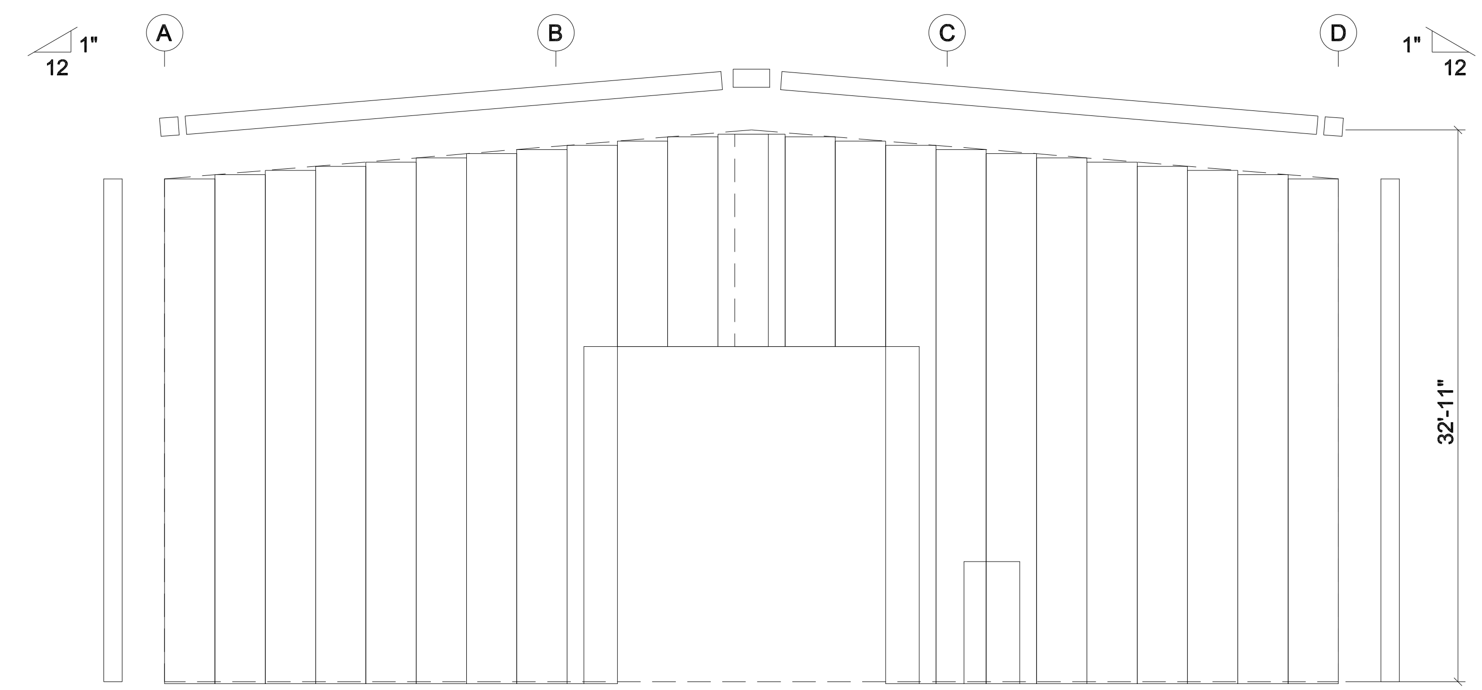
Drawing	SIDEWALL DRAWING
Buyer	Steel Buildings Northwest, Inc
Customer	ABC Recycling Bellingham, WA 98225
Project Name	ABC Recycling - bldg 4

CHIEF BUILDINGS

DATE DRAWN	QUOTE NO.
8/25/23	FQ74901A



ENDWALL FRAMING: FRAME LINE 1



ENDWALL SHEETING & TRIM: FRAME LINE 1

PANELS: 26 Ga. TBD - Std. SMP Finish

GIRT DEPTH: 10.00

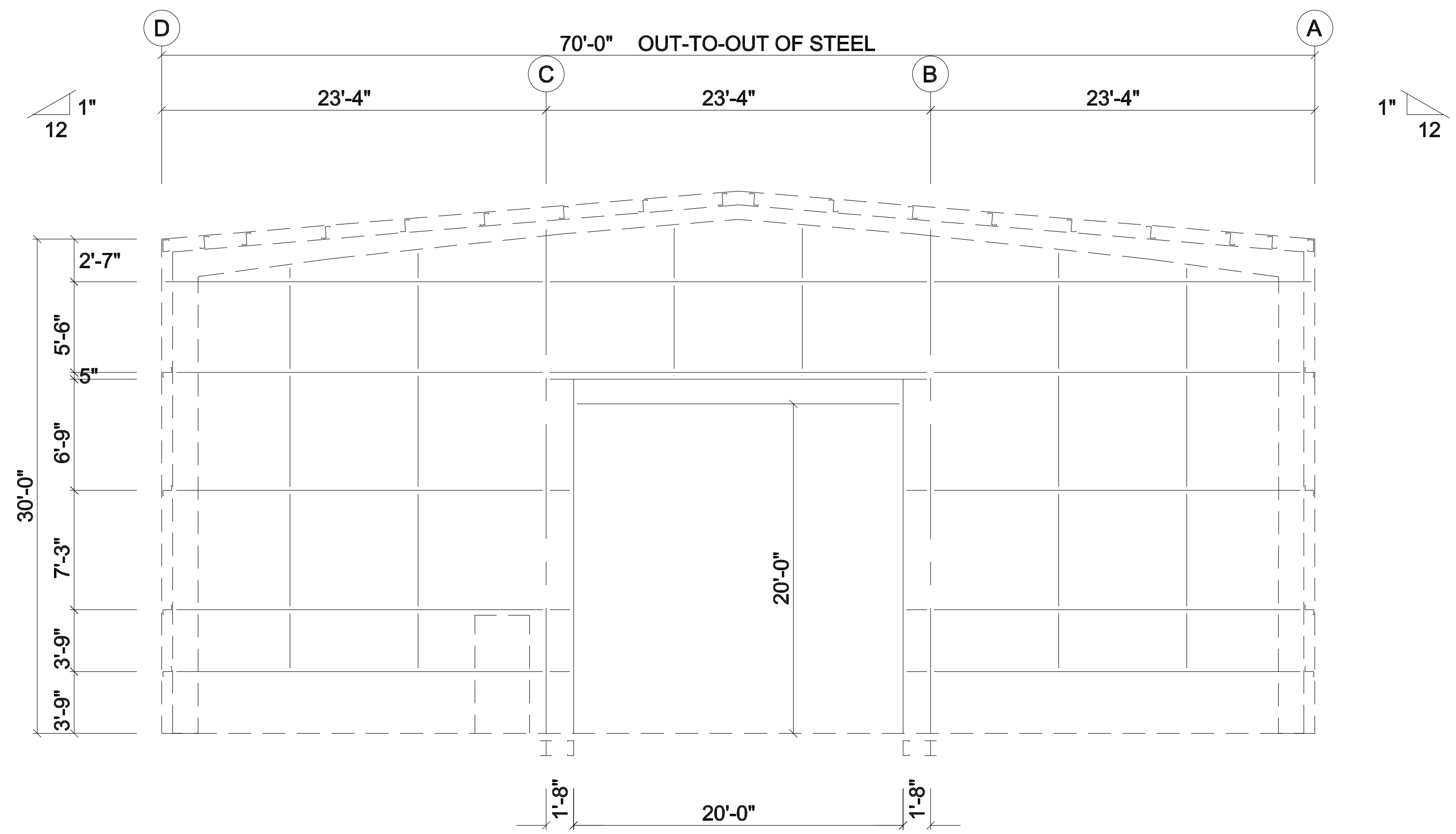
PRELIMINARY

- Preliminary drawings for sales and estimating purposes only.
- Subject to change during order process.

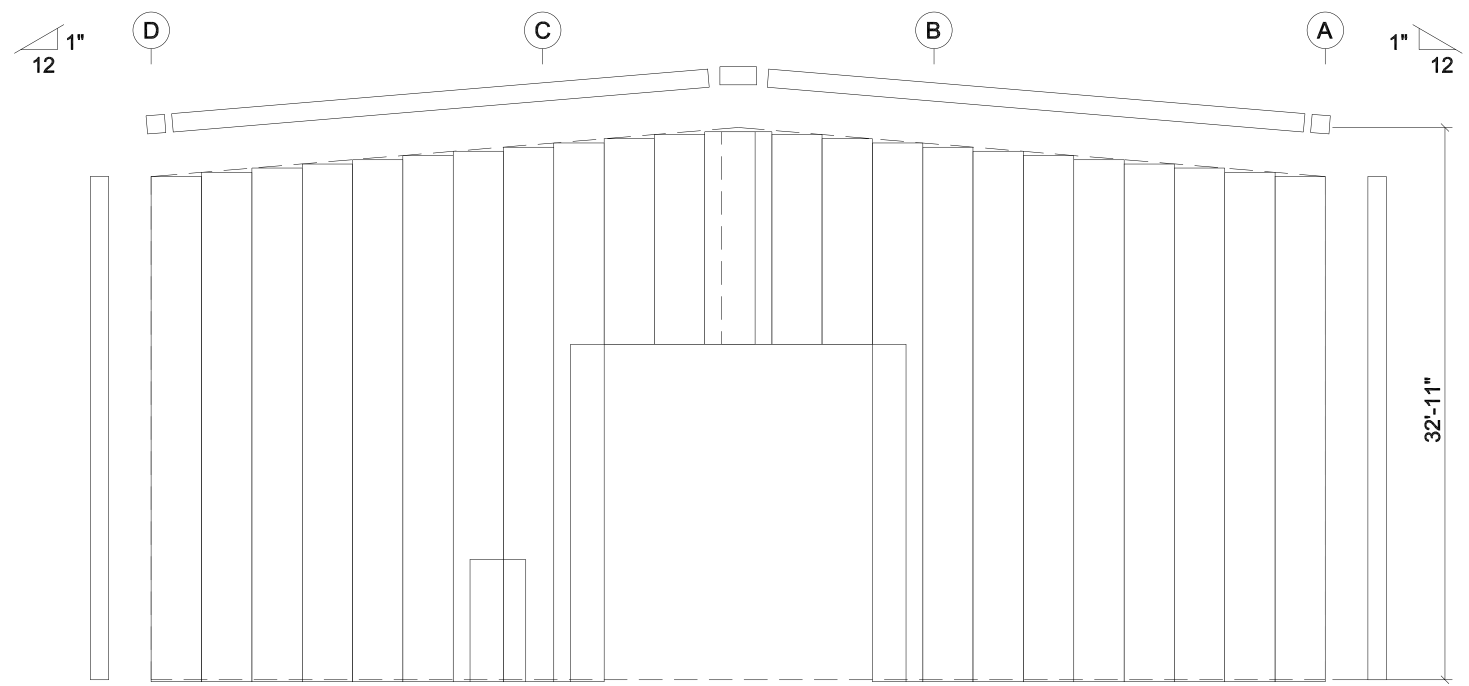
NOT FOR CONSTRUCTION

Drawing	ENDWALL DRAWING
Buyer	Steel Buildings Northwest, Inc
Customer	ABC Recycling Bellingham, WA 98225
Project Name	ABC Recycling - bldg 4

CHIEF BUILDINGS	DATE DRAWN	QUOTE NO.
	8/25/23	FQ74901A



ENDWALL FRAMING: FRAME LINE 5



ENDWALL SHEETING & TRIM: FRAME LINE 5

PANELS: 26 Ga. TBD - Std. SMP Finish

GIRT DEPTH: 10.00

PRELIMINARY

- Preliminary drawings for sales and estimating purposes only.
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NOT FOR CONSTRUCTION

Drawing	ENDWALL DRAWING
Buyer	Steel Buildings Northwest, Inc
Customer	ABC Recycling Bellingham, WA 98225
Project Name	ABC Recycling - bldg 4

CHIEF BUILDINGS

DATE DRAWN	QUOTE NO.
8/25/23	FQ74901A

ALPINE
ENGINEERING, LLC

203 W. Chestnut
Bellingham, WA 98225

(360) 200-8703
alpineengineer.com

STRUCTURAL CALCULATIONS

PREPARED FOR:

DATE:
October 18, 2023

PROJECT NO.:
20004

PROJECT NAME:
ABC Recycling; Buildings 3 & 4 Reclamation

PROJECT TYPE:
PEMB Foundation Design

PROJECT ADDRESS:
741 Marine Drive
Bellingham, WA

ARCHITECT:
TRC Architecture
PO Box 1075
Bellingham, WA 98227
(360) 393-3131

PROJECT ENGINEER:
Brandon Hausmann, PE

ALPINE
ENGINEERING, LLC

203 W. Chestnut
Bellingham, WA 98225

(360) 200-8703
alpineengineer.com

TABLE OF CONTENTS

ALPINE ENGINEERING, LLC

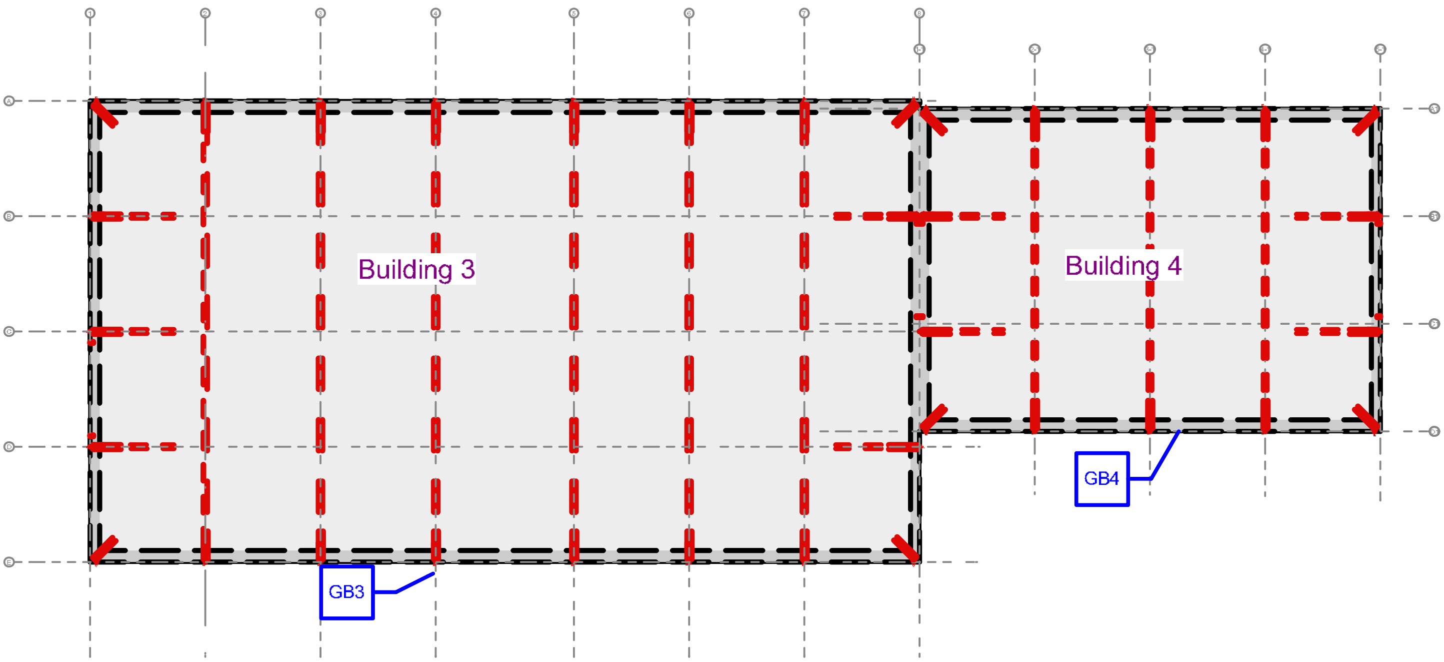
ABC Recycling

Building 3 & 4 Reclamation

741 Marine Drive
Bellingham, Washington

Job No.: No. 20004

Foundation Layout



Project:	Bldg. 3 Reclamation
Location:	Bellingham, WA
Client:	TRC
Engr:	SMW
Job #:	20004
Date:	10/3/2023

ALPINE ENGINEERING, LLC

Structural Design Criteria

Structural abstract / scope of work:

Structural engineering is provided for the ABC Recycling Building No. 3 Reclamation located in Whatcom County WA. The structure is a 1-story Pre-Engineered Metal Building (PEMB). Foundation is a continuous perimeter concrete grade beam, pad and interior slab-on-grade. Foundation design is based on architectural plans provided by TRC Architects (Project #22-001, dated Sept. 29 2023) and Steel Buildings Northwest Inc. (Quote # FQ74801A, dated 8/25/23.). The structural scope of work is for the foundation only, no analysis of the superstructure or future tenant improvement has been performed; all column reactions are provided by the PEMB manufacturer.

Grade beam calculations at Grid L are shown as 3 separate calculations: composite section, positive bending and negative bending. The positive and negative bending calculations are shown for referencne and are not failing as indicated in the calculations. The modeling limitations cannot show the complete picture, and are used to graph the bending moments at the worst case positive (at the column point loads) and negative (mid way between columns) moments to design for the minimum amount of reinforcement required at those points.

General:

Building department:	Whatcom Co.
Applicable Building Code:	2018 IBC
Importance Category:	II

Gravity Loading: *Per Mfr. Reactions*

Soils Data:

Geotechnical Engineer:	NA	
Allowable Bearing Pressure:	2000 psf	**Field Verified
Min. Frost embedment:	18 "	(Per Whatcom Co.)

PROJECT:	BLDG. 3 RECLAMATION
LOCATION:	BELLINGHAM, WA
CLIENT:	TRC
ENGR:	SMW
JOB #:	20004
DATE:	10/3/2023

ALPINE ENGINEERING, LLC

Design Parameters

Code: 2018 IBC

** Please Refer to Structural Specification on S-1.1 for more detailed information*

Foundations:	Contrete	3000 psi
	Rebar (#5 & larger)	60 ksi
	Rebar (#3 & #4)	40 ksi

Note:

The intent of lateral design is to prevent structural failures in the event of seismic activities or high winds, but not to prevent the damage of architectural finishes or systems. The lateral calculations herein conform to the specifications of the current International Building Code (IBC).

Beam on Elastic Foundation

Project File: ABC Bldg 3 Reclamation - [180x100].ec6

LIC# : KW-06012917, Build:20.23.08.30 | Alpine Engineering, LLC | (c) ENERCALC INC 1983-2023

DESCRIPTION: Grid E - Composite Section

CODE REFERENCES

Calculations per ACI 318-14, IBC 2018, CBC 2019, ASCE 7-16
Load Combinations Used : ASCE 7-16

Material Properties

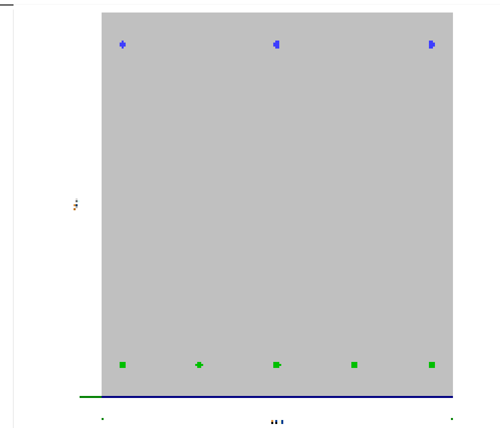
f'c	=	2.50 ksi	ϕ Phi Values	Flexure :	0.90	
fr = $f'c^{1/2}$ * 7.50	=	375.0 psi		Shear :	0.750	
ψ Density	=	145.0 pcf	β_1	=	0.850	
λ Lt Wt Factor	=	1.0				
Elastic Modulus	=	3,122.0 ksi				

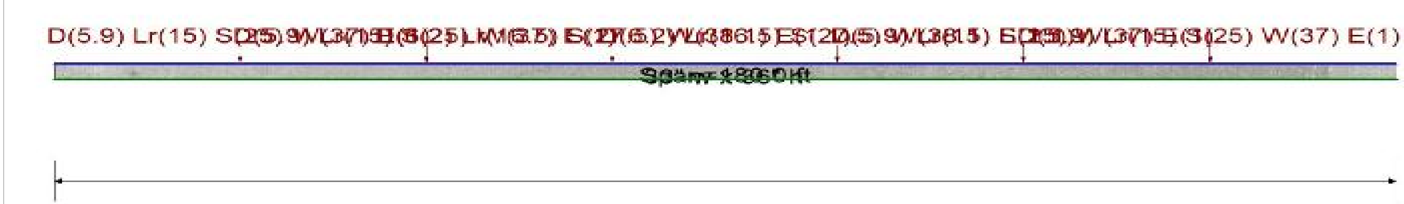
Soil Subgrade Modulus = 250.0 psi / (inch deflection)

Load Combination ASCE 7-16

fy - Main Rebar	= 60.0 ksi	Fy - Stirrups	=	40.0 ksi	
E - Main Rebar	= 29,000.0 ksi	E - Stirrups	=	29,000.0 ksi	
		Stirrup Bar Size #	=	# 3	
		Number of Resisting Legs Per Stirrup		2	

Beam is supported on an elastic foundation,





Cross Section & Reinforcing Details

Rectangular Section, Width = 33.0 in, Height = 36.0 in
Span #1 Reinforcing....
3-#5 at 3.0 in from Top, from 0.0 to 180.0 ft in this span 5-#5 at 3.0 in from Bottom, from 0.0 to 180.0 ft in this s

Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight calculated and added to loads

Point Load : D = 5.90, Lr = 15.0, S = 25.0, W = 37.0, E = 1.0 k @ 25.0 ft
Point Load : D = 5.90, Lr = 15.0, S = 25.0, W = 37.0, E = 1.0 k @ 50.0 ft
Point Load : D = 6.20, Lr = 16.50, S = 27.50, W = 38.10, E = 1.10 k @ 75.0 ft
Point Load : D = 6.20, Lr = 16.50, S = 27.50, W = 38.10, E = 1.10 k @ 105.0 ft
Point Load : D = 5.90, Lr = 15.0, S = 25.0, W = 37.0, E = 1.0 k @ 130.0 ft
Point Load : D = 5.90, Lr = 15.0, S = 25.0, W = 37.0, E = 1.0 k @ 155.0 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio =	**0.565** : 1	Maximum Deflection	
Section used for this span	**Typical Section**	Max Downward L+Lr+S Deflection	0.000 in
Mu : Applied	129.584 k-ft	Max Upward L+Lr+S Deflection	0.000 in
Mn * Phi : Allowable	229.153 k-ft	Max Downward Total Deflection	0.033 in
Load Combination	+1.20D+1.60S+0.50W	Max Upward Total Deflection	0.007 in
Location of maximum on span	25.412 ft		
Span # where maximum occurs	Span # 1		

Maximum Soil Pressure = **1.172** ksf at 106.00 ft LdComb: +D+0.750S+0.450W
Allowable Soil Pressure = **2.0** ksf **OK**

Shear Stirrup Requirements

Entire Beam Span Length : Vu < PhiVc/2, Req'd Vs = Not Reqd, use stirrups spaced at 0.000 in

Maximum Forces & Stresses for Load Combinatio

Load Combination				Bending Stress Results (k-ft)		
Segment Length		Span #	Location (ft) in Span	Mu : Max	Phi*Mnx	Stress Ratio
MAXimum Bending Envelope						

Beam on Elastic Foundation

Project File: ABC Bldg 3 Reclamation - [180x100].ec6

LIC# : KW-06012917, Build:20.23.08.30 Alpine Engineering, LLC

DESCRIPTION: Grid E - Composite Section

Load Combination / Segment Length	Span #	Location (ft) in Span	Bending Stress Results (k-ft) Mu : Max	Phi*Mnx	Stress Ratio
Span # 1	1	25.412	129.58	229.15	0.57
+1.40D					
Span # 1	1	25.412	15.92	229.15	0.07
+1.20D+0.50Lr					
Span # 1	1	25.412	28.45	229.15	0.12
+1.20D+0.50S					
Span # 1	1	25.412	38.37	229.15	0.17
+1.20D+1.60Lr					
Span # 1	1	25.412	61.18	229.15	0.27
+1.20D+1.60Lr+0.50W					
Span # 1	1	25.412	97.85	229.15	0.43
+1.20D+1.60Lr-0.50W					
Span # 1	1	25.412	24.51	229.15	0.11
+1.20D+1.60S					
Span # 1	1	25.412	92.92	229.15	0.41
+1.20D+1.60S+0.50W					
Span # 1	1	25.412	129.58	229.15	0.57
+1.20D+1.60S-0.50W					
Span # 1	1	25.412	56.25	229.15	0.25
+1.20D+0.50Lr+W					
Span # 1	1	25.412	101.79	229.15	0.44
+1.20D+0.50Lr-W					
Span # 1	1	##.###	6.44	229.15	0.03
+1.20D+0.50S+W					
Span # 1	1	25.412	111.71	229.15	0.49
+1.20D+0.50S-W					
Span # 1	1	##.###	4.95	229.15	0.02
+0.90D+W					
Span # 1	1	25.412	83.41	229.15	0.36
+0.90D-W					
Span # 1	1	##.###	9.21	229.15	0.04
+1.20D+0.20S+E					
Span # 1	1	25.412	25.48	229.15	0.11
+0.90D+E					
Span # 1	1	25.412	12.05	229.15	0.05

Overall Maximum Deflections - Unfactored L

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
Span 1	1	0.0326	106.000		0.0000	0.000

Detailed Shear Information

Load Combination	Span Number	Distance (ft)	'd' (in)	Vu (k) Actual	Design	Mu (k-ft)	d*Vu/Mu	Phi*Vc (k)	Comment	Phi*Vs (k)	Spacing (in) Req'd	Suggest
+0.90D-W	1	0.00	33.00	1.68	1.68	0.00	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+0.90D-W	1	2.12	33.00	2.21	2.21	0.87	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+0.90D-W	1	4.24	33.00	2.45	2.45	2.86	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+0.90D-W	1	6.35	33.00	2.38	2.38	5.35	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+0.90D-W	1	8.47	33.00	1.98	1.98	7.70	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	10.59	33.00	1.30	1.30	19.80	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	12.71	33.00	3.72	3.72	19.73	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	14.82	33.00	7.05	7.05	14.54	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	16.94	33.00	11.33	11.33	2.30	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	19.06	33.00	16.58	16.58	19.01	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	21.18	33.00	22.70	22.70	51.44	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	23.29	33.00	29.48	29.48	96.84	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	25.41	33.00	-29.07	29.07	129.58	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	27.53	33.00	-22.27	22.27	65.35	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	29.65	33.00	-15.99	15.99	15.50	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	31.76	33.00	-10.30	10.30	21.04	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	33.88	33.00	-5.11	5.11	45.53	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+0.90D-W	1	36.00	33.00	2.00	2.00	27.85	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	38.12	33.00	4.48	4.48	62.27	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	40.24	33.00	9.36	9.36	55.47	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	42.35	33.00	14.60	14.60	38.32	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	44.47	33.00	20.34	20.34	10.09	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	46.59	33.00	26.61	26.61	30.30	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	48.71	33.00	33.28	33.28	83.97	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	50.82	33.00	-25.58	25.58	97.75	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	52.94	33.00	-19.19	19.19	40.90	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00

Beam on Elastic Foundation

Project File: ABC Bldg 3 Reclamation - [180x100].ec6

LIC# : KW-06012917, Build:20.23.08.30 Alpine Engineering, LLC (c) ENERCALC INC 1983-2023

DESCRIPTION: Grid E - Composite Section

Detailed Shear Information

Load Combination	Span Number	Distance (ft)	'd' (in)	Vu (k) Actual	Vu (k) Design	Mu (k-ft)	d*Vu/Mu	Phi*Vc (k)	Comment	Phi*Vs (k)	Spacing (in) Req'd	Spacing (in) Suggest
+1.20D+1.60S+0.50W	1	55.06	33.00	-13.32	13.32	2.43	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	57.18	33.00	-7.96	7.96	33.32	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+0.90D-W	1	59.29	33.00	3.33	3.33	24.12	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	61.41	33.00	1.82	1.82	61.84	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	63.53	33.00	6.68	6.68	60.67	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	65.65	33.00	11.83	11.83	49.21	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	67.76	33.00	17.48	17.48	26.83	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	69.88	33.00	23.72	23.72	7.50	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	72.00	33.00	30.50	30.50	55.05	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	74.12	33.00	37.59	37.59	116.95	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	76.24	33.00	-25.96	25.96	106.80	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	78.35	33.00	-19.61	19.61	49.15	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	80.47	33.00	-14.06	14.06	4.95	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	82.59	33.00	-9.35	9.35	27.51	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	84.71	33.00	-5.36	5.36	49.99	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+0.90D-W	1	86.82	33.00	2.72	2.72	28.87	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S-0.50W	1	88.94	33.00	1.27	1.27	32.78	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	91.06	33.00	4.44	4.44	70.74	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	93.18	33.00	7.89	7.89	64.02	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	95.29	33.00	11.88	11.88	49.99	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	97.41	33.00	16.59	16.59	27.51	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	99.53	33.00	22.14	22.14	4.95	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	101.65	33.00	28.49	28.49	49.15	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	103.76	33.00	35.43	35.43	106.80	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	105.88	33.00	-27.97	27.97	116.95	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	108.00	33.00	-21.18	21.18	55.05	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	110.12	33.00	-14.95	14.95	7.50	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	112.24	33.00	-9.30	9.30	26.83	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	114.35	33.00	-4.14	4.14	49.21	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+0.90D-W	1	116.47	33.00	1.47	1.47	28.05	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	118.59	33.00	5.51	5.51	61.84	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	120.71	33.00	10.49	10.49	52.85	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	122.82	33.00	15.85	15.85	33.32	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	124.94	33.00	21.73	21.73	2.43	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	127.06	33.00	28.11	28.11	40.90	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	129.18	33.00	34.84	34.84	97.75	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	131.29	33.00	-24.08	24.08	83.97	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	133.41	33.00	-17.81	17.81	30.30	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	135.53	33.00	-12.07	12.07	10.09	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	137.65	33.00	-6.83	6.83	38.32	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+0.90D-W	1	139.76	33.00	2.83	2.83	26.07	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	141.88	33.00	2.80	2.80	62.27	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	144.00	33.00	7.64	7.64	59.03	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	146.12	33.00	12.83	12.83	45.53	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	148.24	33.00	18.52	18.52	21.04	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	150.35	33.00	24.81	24.81	15.50	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	152.47	33.00	31.60	31.60	65.35	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	154.59	33.00	38.63	38.63	129.58	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	156.71	33.00	-20.17	20.17	96.84	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	158.82	33.00	-14.05	14.05	51.44	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	160.94	33.00	-8.80	8.80	19.01	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	163.06	33.00	-4.51	4.51	2.30	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+0.90D-W	1	165.18	33.00	2.48	2.48	6.52	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+0.90D-W	1	167.29	33.00	1.32	1.32	9.10	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	169.41	33.00	2.82	2.82	19.80	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	171.53	33.00	3.65	3.65	16.51	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	173.65	33.00	3.79	3.79	11.46	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	175.76	33.00	3.28	3.28	6.11	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	177.88	33.00	2.14	2.14	1.86	1.00	82.24	Vu < PhiVc/2	Not Reqd	0.00	0.00

Project:	ABC Building 3 Reclamation
Location:	Bellingham, WA
Client:	TRC
Engr:	SMW
Job #:	20004
Date:	10/4/2023

ALPINE
ENGINEERING, LLC

PEMB Column Reactions & Load Combinations

Load Combinations per ASCE 7-10

ASD Load Combinations		LRFD Load Combinations		PEMB Reaction definitions	
1	D	1	1.4D	D + Coll	Total Dead Load
2	D+L	2	1.2D+1.6L+0.5(Lr or S or R)	W+	Wind acting inward
3	D+(Lr or S or R)	3	1.2D+1.6(Lr or S or R)+(L or 0.5W)	W-	Wind acting outward (suction)
4	D+0.75L+0.75(Lr or S or R)	4	1.2D+1.0W+L+0.5(Lr or S or R)	E+	Seismic acting inward
5	D+(0.6W or 0.7E)	5	1.2D+1.0E+L+0.2S	E-	Seismic acting outward
6a	D+0.75L+0.75(0.6W)+0.75(Lr or S or R)	6	0.9D+1.0W	W (max)	Total concurrent Wind Loading, worst case
6b	D+0.75L+0.75(0.6E)+0.75S	7	0.9D+1.0E		
7	0.6D+0.6W				
8	0.6D+0.7E				

Grid		Horiz								Vert								Out-of-plane		ASD load combos		
																				Max	Max	Max
		D	Coll	Snow	L	E	W (max)	RS	LS	D	Coll	Snow	L	E	W (max)	RS	LS	E	W (max)	Horiz	Vert	OOP
1	A	0.1	0.1	0.3	0.2	-0.9	-6.6	0.2	0.2	1.2	0.5	3.4	2.1	-1.3	-9.4	1.1	2.6	7.5	8.5	4.2	8.5	5.6
1	B	0	0	0	0	0	0	0	0	1.5	0.9	6.2	3.7	-1.5	-9.5	0.8	7.5	7.5	8.5	0.0	12.3	5.6
1	C	0	0	0	0	0	0	0	0	1.7	1.1	7.1	4.2	0	-9.3	6.3	6.3	7.5	8.5	0.0	12.3	5.6
1	D	0	0	0	0	0	0	0	0	1.5	0.9	6.2	3.7	-1.5	-7.1	7.5	0.8	7.5	8.5	0.0	11.2	5.6
1	E	-0.1	-0.1	-0.3	-0.2	-0.9	6.8	-0.2	-0.2	1.2	0.5	3.4	2.1	-1.3	-9.4	2.6	1.1	7.5	8.5	4.0	8.5	5.6
2*	A	2.7	2.1	14.1	8.4	-1.8	-19.4	12.8	-1.8	5.9	3.8	25	15	-1.8	-37	12.8	22	7.5	8.5	24.1	45.1	5.6
2*	E	-2.7	-2.1	-14.1	-8.4	-1.8	19.4	22	-1.8	5.9	3.8	25	15	-1.8	-37	22	12.8	7.5	8.5	20.4	45.1	5.6
4*	A	2.8	2.3	15.1	9	-2	-20.9	14.1	-2	6.2	4.1	27.5	16.5	-1.1	-38.1	14.1	24.2	7.5	8.5	25.8	48.1	5.6
4*	E	-2.8	-2.3	-15.1	-9	-2	20.9	24.2	-2	6.2	4.1	27.5	16.5	-1.1	-38.1	24.2	14.1	7.5	8.5	22.5	48.1	5.6

4 Corresponds to Frames at Grids 4,5*
2 Corresponds to Frames at Grids 2,3,6,7*
1 Corresponds to Frames at Grids 1,8*

PROJECT:	ABC BUILDING 3 RECLAMATION
LOCATION:	BELLINGHAM, WA
CLIENT:	TRC
ENGR:	SMW
JOB #:	20004
DATE:	10/4/2023

ALPINE ENGINEERING, LLC

Wind & Seismic Uplift Calculations:

Grid		PEMB D+Coll	E	UPLIFT W	ASD UPLIFT SEIS	WIND	LRFD UPLIFT SEIS	WIND		Down +	lateral
1	A	1.7	-1.3	-9.3	32.1	24.1	48.8	40.8	*OK*	24.1	7.19
2*	A	9.7	-1.8	-37	36.4	1.2	55.5	20.3	*OK*	1.2	40.61
4*	A	10.3	-1.1	-38.1	37.5	0.5	56.8	19.8	*OK*	0.5	43.57

Conc. Unit Weight	145	lb/cf
Fdn. Trib Length	30	ft
Fdn. Depth	36	in
Fdn. Width	33	in
Slab Trib. Area	250	sf
Slab Thickness	6	in
Total Trib. Fdn. Weight =	54.0	kips

4 Corresponds to Frames at Grids 4,5*
2 Corresponds to Frames at Grids 2,3,6,7*
1 Corresponds to Frames at Grids 1,8*

Hairpin Tension Calculations:

fy hairpin = 60 ksi   Area Req'd = 0.807 in^2

Max Horiz. Force 43.57 kip

USE:

#6 Hairpin   OR (2) #5 Hairpins

Anchor Designer™
Software
Version 3.2.2309.2

Company:		Date:	10/4/2023
Engineer:	BAH	Page:	1/5
Project:	ABC Recycling - Bldg 3		
Address:			
Phone:			
E-mail:			

1.Project information

Customer company:
Customer contact name:
Customer e-mail:
Comment:

Project description:
Location:
Fastening description:

2. Input Data & Anchor Parameters

General
Design method:ACI 318-14
Units: Imperial units

Anchor Information:
Anchor type: Cast-in-place
Material: AB_H
Diameter (inch): 0.750
Effective Embedment depth, h_{ef} (inch): 24.000
Anchor category: -
Anchor ductility: Yes
h_{min} (inch): 26.25
C_{min} (inch): 1.63
S_{min} (inch): 3.00

Base Material
Concrete: Normal-weight
Concrete thickness, h (inch): 36.00
State: Cracked
Compressive strength, f'_c (psi): 3000
$\Psi_{c,V}$: 1.0
Reinforcement condition: B tension, B shear
Supplemental edge reinforcement: Not applicable
Reinforcement provided at corners: No
Ignore concrete breakout in tension: No
Ignore concrete breakout in shear: No
Ignore 6do requirement: Yes
Build-up grout pad: No

Base Plate
Length x Width x Thickness (inch): 10.50 x 6.00 x 0.38

Recommended Anchor
Anchor Name: PAB Pre-Assembled Anchor Bolt - PAB6H (3/4"Ø)

Anchor Designer™
Software
Version 3.2.2309.2

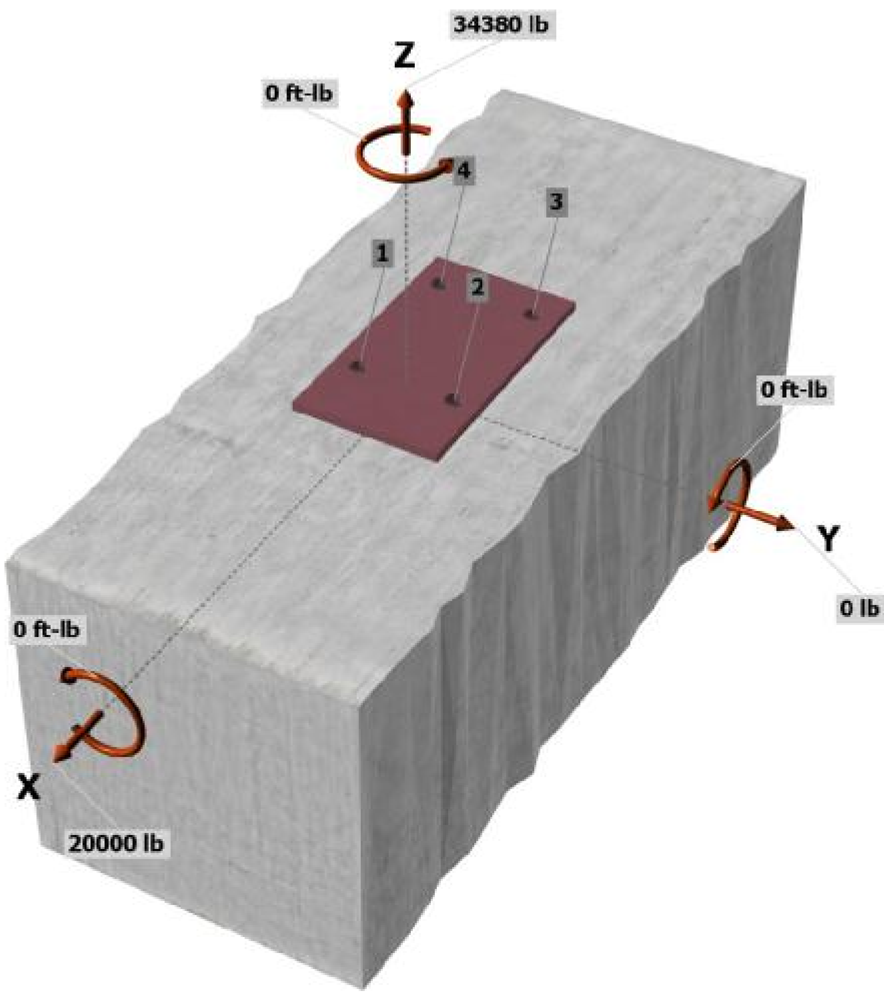
Company:		Date:	10/4/2023
Engineer:	BAH	Page:	2/5
Project:	ABC Recycling - Bldg 3		
Address:			
Phone:			
E-mail:			

Load and Geometry
Load factor source: ACI 318 Section 5.3
Load combination: not set
Seismic design: No
Anchors subjected to sustained tension: Not applicable
Apply entire shear load at front row: No
Anchors only resisting wind and/or seismic loads: No

Strength level loads:

N_{ua} [lb]: 34380
V_{uax} [lb]: 20000
V_{uay} [lb]: 0
M_{ux} [ft-lb]: 0
M_{uy} [ft-lb]: 0
M_{uz} [ft-lb]: 0

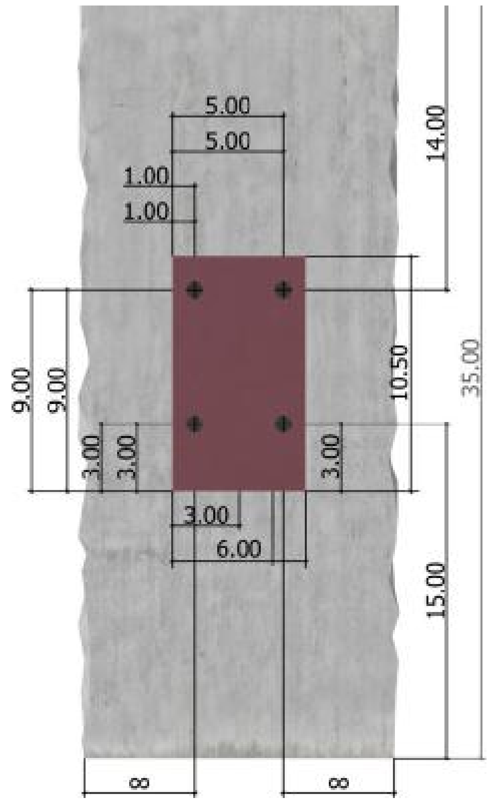
<Figure 1>



Anchor Designer™
Software
Version 3.2.2309.2

Company:		Date:	10/4/2023
Engineer:	BAH	Page:	3/5
Project:	ABC Recycling - Bldg 3		
Address:			
Phone:			
E-mail:			

<Figure 2>



Anchor Designer™
Software
Version 3.2.2309.2

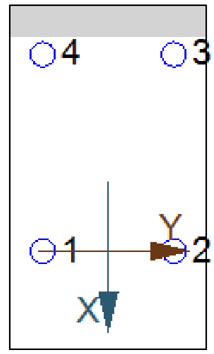
Company:		Date:	10/4/2023
Engineer:	BAH	Page:	4/5
Project:	ABC Recycling - Bldg 3		
Address:			
Phone:			
E-mail:			

3. Resulting Anchor Forces

Anchor	Tension load, N_{ua} (lb)	Shear load x, V_{uax} (lb)	Shear load y, V_{uay} (lb)	Shear load combined, $\sqrt{(V_{uax})^2+(V_{uay})^2}$ (lb)
1	16961.2	5000.0	0.0	5000.0
2	16961.2	5000.0	0.0	5000.0
3	1392.8	5000.0	0.0	5000.0
4	1392.8	5000.0	0.0	5000.0
Sum	36708.0	20000.0	0.0	20000.0

Maximum concrete compression strain (‰): 0.19
Maximum concrete compression stress (psi): 806
Resultant tension force (lb): 36708
Resultant compression force (lb): 2328
Eccentricity of resultant tension forces in x-axis, e'_{Nx} (inch): 0.00
Eccentricity of resultant tension forces in y-axis, e'_{Ny} (inch): 2.54
Eccentricity of resultant shear forces in x-axis, e'_{Vx} (inch): 0.00
Eccentricity of resultant shear forces in y-axis, e'_{Vy} (inch): 0.00

<Figure 3>



4. Steel Strength of Anchor in Tension (Sec. 17.4.1)

N_{sa} (lb)	ϕ	ϕN_{sa} (lb)
40080	0.75	30060

5. Concrete Breakout Strength of Anchor in Tension (Sec. 17.4.2)

$N_b = 16\lambda_a\sqrt{f'_c}h_{ef}^{5/3}$ (Eq. 17.4.2.2b)

λ_a	f'_c (psi)	h_{ef} (in)	N_b (lb)
1.00	3000	24.000	174998

$\phi N_{cbg} = \phi\ (A_{Nc}/A_{Nco})\,\Psi_{ec,N}\Psi_{ed,N}\Psi_{c,N}\Psi_{cp,N}N_b$ (Sec. 17.3.1 & Eq. 17.4.2.1b)

A_{Nc} (in^2)	A_{Nco} (in^2)	$c_{a,min}$ (in)	$\Psi_{ec,N}$	$\Psi_{ed,N}$	$\Psi_{c,N}$	$\Psi_{cp,N}$	N_b (lb)	ϕ	ϕN_{cbg} (lb)
2738.75	5184.00	14.00	0.934	0.817	1.00	1.000	174998	0.70	49363

6. Pullout Strength of Anchor in Tension (Sec. 17.4.3)

$\phi N_{pn} = \phi\Psi_{c,P}N_p = \phi\Psi_{c,P}8A_{brg}f'_c$ (Sec. 17.3.1, Eq. 17.4.3.1 & 17.4.3.4)

$\Psi_{c,P}$	A_{brg} (in^2)	f'_c (psi)	ϕ	ϕN_{pn} (lb)
1.0	3.53	3000	0.70	59371

SIMPSON Strong-Tie

Anchor Designer™
Software
Version 3.2.2309.2

Company:		Date:	10/4/2023
Engineer:	BAH	Page:	5/5
Project:	ABC Recycling - Bldg 3		
Address:			
Phone:			
E-mail:			

8. Steel Strength of Anchor in Shear (Sec. 17.5.1)

V_{sa} (lb)	ϕ_{grout}	ϕ	$\phi_{grout}\phi V_{sa}$ (lb)
24050	1.0	0.65	15633

9. Concrete Breakout Strength of Anchor in Shear (Sec. 17.5.2)

Shear perpendicular to edge in x-direction:

$V_{bx} = \min|7(l_e/d_a)^{0.2}\sqrt{d_a}\lambda_a\sqrt{f'_c}c_{a1}^{1.5}; 9\lambda_a\sqrt{f'_c}c_{a1}^{1.5}|$ (Eq. 17.5.2.2a & Eq. 17.5.2.2b)

l_e (in)	d_a (in)	λ_a	f'_c (psi)	c_{a1} (in)	V_{bx} (lb)
6.00	0.750	1.00	3000	21.00	47439

$\phi V_{cbgx} = \phi\,(A_{Vc}/A_{Vco})\,\Psi_{ec,V}\,\Psi_{ed,V}\,\Psi_{c,V}\,\Psi_{h,V}V_{bx}$ (Sec. 17.3.1 & Eq. 17.5.2.1b)

A_{Vc} (in^2)	A_{Vco} (in^2)	$\Psi_{ec,V}$	$\Psi_{ed,V}$	$\Psi_{c,V}$	$\Psi_{h,V}$	V_{bx} (lb)	ϕ	ϕV_{cbgx} (lb)
2110.50	1984.50	1.000	1.000	1.000	1.000	47439	0.70	35315

10. Concrete Pryout Strength of Anchor in Shear (Sec. 17.5.3)

$\phi V_{cpg} = \phi k_{cp}N_{cbg} = \phi k_{cp}(A_{Nc}/A_{Nco})\,\Psi_{ec,N}\,\Psi_{ed,N}\,\Psi_{c,N}\,\Psi_{cp,N}N_b$ (Sec. 17.3.1 & Eq. 17.5.3.1b)

k_{cp}	A_{Nc} (in^2)	A_{Nco} (in^2)	$\Psi_{ec,N}$	$\Psi_{ed,N}$	$\Psi_{c,N}$	$\Psi_{cp,N}$	N_b (lb)	ϕ	ϕV_{cpg} (lb)
2.0	2738.75	5184.00	1.000	0.817	1.000	1.000	174998	0.70	105704

11. Results

Interaction of Tensile and Shear Forces (Sec. R17.6)

Tension	Factored Load, N_{ua} (lb)	Design Strength, ϕN_n (lb)	Ratio	Status
Steel	16961	30060	0.56	Pass
Concrete breakout	**36708**	**49363**	**0.74**	**Pass (Governs)**
Pullout	16961	59371	0.29	Pass

Shear	Factored Load, V_{ua} (lb)	Design Strength, ϕV_n (lb)	Ratio	Status
Steel	5000	15633	0.32	Pass
T Concrete breakout x+	**20000**	**35315**	**0.57**	**Pass (Governs)**
Pryout	20000	105704	0.19	Pass

Interaction check	$(N_{ua}/\phi N_{ua})^{5/3}$	$(V_{ua}/\phi V_{ua})^{5/3}$	Combined Ratio	Permissible	Status
Sec. R17.6	0.61	0.39	99.8%	1.0	Pass

PAB6H (3/4"Ø) with hef = 24.000 inch meets the selected design criteria.

12. Warnings

- Minimum spacing and edge distance requirement of 6da per ACI 318 Sections 17.7.1 and 17.7.2 for torqued cast-in-place anchor is waived per designer option.

- Designer must exercise own judgement to determine if this design is suitable.

ALPINE
ENGINEERING, LLC

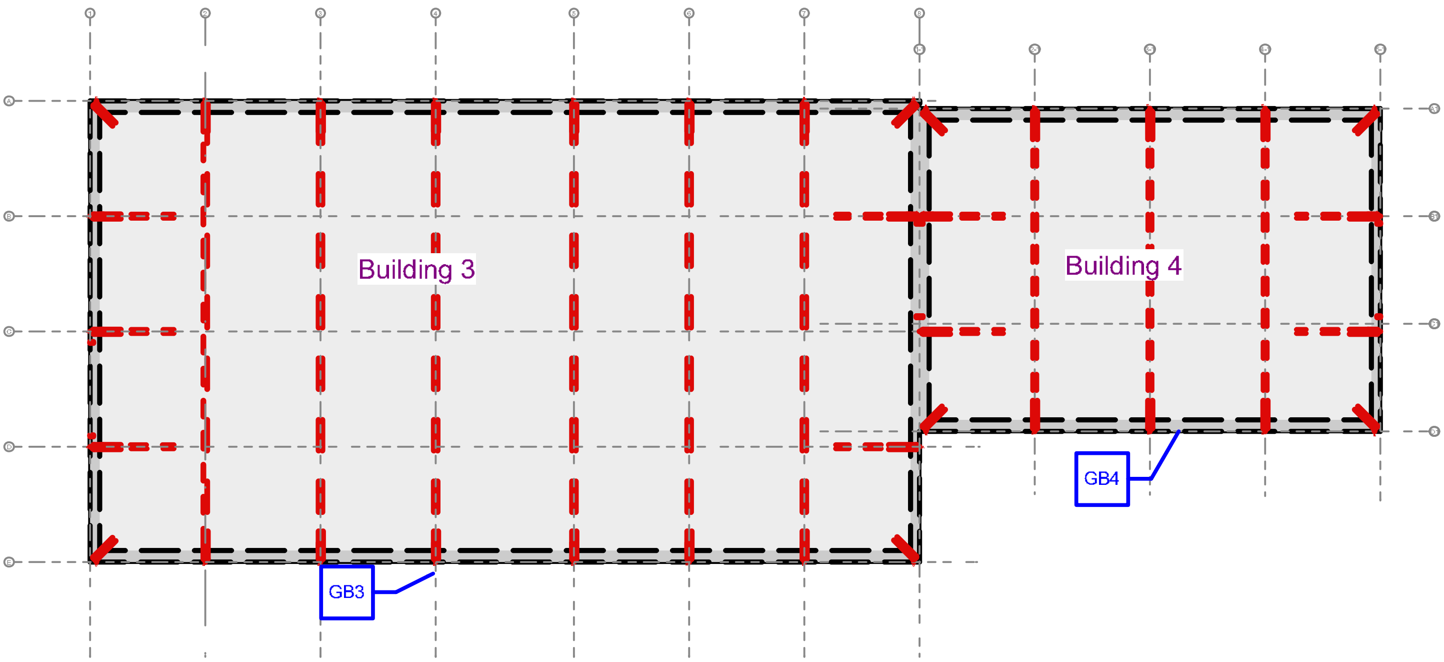
ABC Recycling

Building 3 & 4 Reclamation

741 Marine Drive
Bellingham, Washington

Job No.: No. 20004

Foundation Layout



Project:	Bldg. 4 Reclamation
Location:	Bellingham, WA
Client:	TRC
Engr:	SMW
Job #:	20004
Date:	10/3/2023

ALPINE ENGINEERING, LLC

Structural Design Criteria

Structural abstract / scope of work:

Structural engineering is provided for the ABC Recycling Building No. 4 Reclamation located in Whatcom County WA. The structure is a 1-story Pre-Engineered Metal Building (PEMB). Foundation is a continuous perimeter concrete grade beam, pad and interior slab-on-grade. Foundation design is based on architectural plans provided by TRC Architects (Project #22-001, dated Sept. 29 2023) and Steel Buildings Northwest Inc. (Quote # FQ74801A, dated 8/25/23.). The structural scope of work is for the foundation only, no analysis of the superstructure or future tenant improvement has been performed; all column reactions are provided by the PEMB manufacturer.

Grade beam calculations at Grid L are shown as 3 separate calculations: composite section, positive bending and negative bending. The positive and negative bending calculations are shown for referencne and are not failing as indicated in the calculations. The modeling limitations cannot show the complete picture, and are used to graph the bending moments at the worst case positive (at the column point loads) and negative (mid way between columns) moments to design for the minimum amount of reinforcement required at those points.

General:

Building department:	Whatcom Co.
Applicable Building Code:	2018 IBC
Importance Category:	II

Gravity Loading: *Per Mfr. Reactions*

Soils Data:

Geotechnical Engineer:	NA	
Allowable Bearing Pressure:	2000 psf	**Field Verified
Min. Frost embedment:	18 "	(Per Whatcom Co.)

PROJECT:	BLDG. 4 RECLAMATION
LOCATION:	BELLINGHAM, WA
CLIENT:	TRC
ENGR:	SMW
JOB #:	20004
DATE:	10/3/2023

ALPINE ENGINEERING, LLC

Design Parameters

Code: 2018 IBC

** Please Refer to Structural Specification on S-1.1 for more detailed information*

Foundations:	Contrete	3000 psi
	Rebar (#5 & larger)	60 ksi
	Rebar (#3 & #4)	40 ksi

Note:

The intent of lateral design is to prevent structural failures in the event of seismic activities or high winds, but not to prevent the damage of architectural finishes or systems. The lateral calculations herein conform to the specifications of the current International Building Code (IBC).

Beam on Elastic Foundation

Project File: ABC Bldg 4 Reclamation small half - [100x70].ec6

LIC# : KW-06012917, Build:20.23.08.30 Alpine Engineering, LLC

DESCRIPTION: Grid D1 - Composite Section

CODE REFERENCES

Calculations per ACI 318-14, IBC 2018, CBC 2019, ASCE 7-16
Load Combinations Used : ASCE 7-16

Material Properties

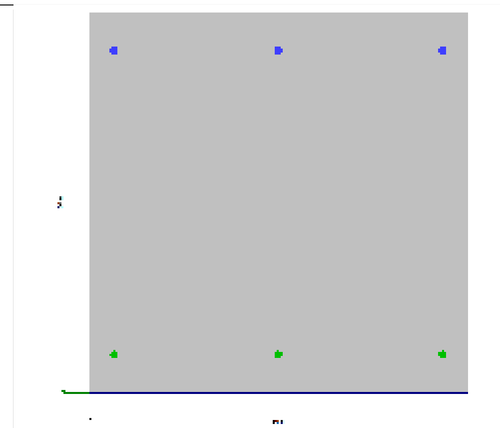
f'c	=	2.50 ksi	ϕ Phi Values Flexure :	0.90
fr = f'c$^{1/2}$ * 7.50	=	375.0 psi	Shear :	0.750
ψ Density	=	145.0 pcf	β_1 =	0.850
λ Lt Wt Factor	=	1.0		
Elastic Modulus	=	3,122.0 ksi		

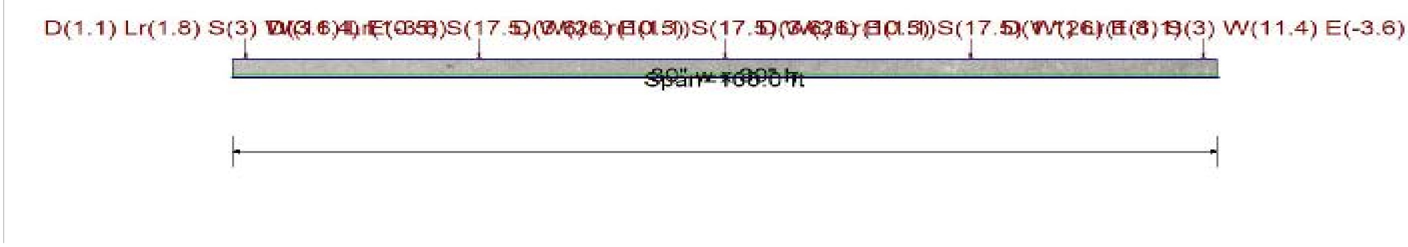
Soil Subgrade Modulus = 250.0 psi / (inch deflection)

Load Combination ASCE 7-16

fy - Main Rebar	=	60.0 ksi	Fy - Stirrups	=	40.0 ksi
E - Main Rebar	=	29,000.0 ksi	E - Stirrups	=	29,000.0 ksi
			Stirrup Bar Size #	=	# 3
			Number of Resisting Legs Per Stirrup		2

Beam is supported on an elastic foundation.





Cross Section & Reinforcing Details

Rectangular Section, Width = 30.0 in, Height = 30.0 in
Span #1 Reinforcing....
3-#5 at 3.0 in from Top, from 0.0 to 100.0 ft in this span 3-#5 at 3.0 in from Bottom, from 0.0 to 100.0 ft in this s

Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight calculated and added to loads
Point Load : D = 1.10, Lr = 1.80, S = 3.0, W = 11.40, E = -3.60 k @ 1.330 ft
Point Load : D = 3.60, Lr = 10.50, S = 17.50, W = 26.0, E = 1.10 k @ 25.0 ft
Point Load : D = 3.60, Lr = 10.50, S = 17.50, W = 26.0, E = 1.10 k @ 50.0 ft
Point Load : D = 3.60, Lr = 10.50, S = 17.50, W = 26.0, E = 1.10 k @ 75.0 ft
Point Load : D = 1.10, Lr = 1.80, S = 3.0, W = 11.40, E = -3.60 k @ 98.670 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio =	**0.703** : 1	Maximum Deflection	
Section used for this span	**Typical Section**	Max Downward L+Lr+S Deflection	0.000 in
Mu : Applied	82.445 k-ft	Max Upward L+Lr+S Deflection	0.000 in
Mn * Phi : Allowable	117.355 k-ft	Max Downward Total Deflection	0.031 in
Load Combination	+1.20D+1.60S+0.50W	Max Upward Total Deflection	0.002 in
Location of maximum on span	24.706 ft		
Span # where maximum occurs	Span # 1		

Maximum Soil Pressure = **1.121** ksf at 0.00 ft LdComb: W Only
Allowable Soil Pressure = **2.0** ksf **OK**

Shear Stirrup Requirements

Entire Beam Span Length : Vu < PhiVc/2, Req'd Vs = Not Reqd, use stirrups spaced at 0.000 in

Maximum Forces & Stresses for Load Combinatio

Load Combination Segment Length	Span #	Location (ft) in Span	Bending Stress Results (k-ft) Mu : Max	Phi*Mnx	Stress Ratio
MAXimum Bending Envelope					
Span # 1	1	24.706	82.44	117.36	0.70

Beam on Elastic Foundation

Project File: ABC Bldg 4 Reclamation small half - [100x70].ec6

LIC# : KW-06012917, Build:20.23.08.30 Alpine Engineering, LLC (c) ENERCALC INC 1983-2023

DESCRIPTION: Grid D1 - Composite Section

Load Combination Segment Length	Span #	Location (ft) in Span	Bending Stress Results (k-ft) Mu : Max	Phi*Mnx	Stress Ratio
+1.40D					
Span # 1	1	24.706	9.03	117.36	0.08
+1.20D+0.50Lr					
Span # 1	1	24.706	17.37	117.36	0.15
+1.20D+0.50S					
Span # 1	1	24.706	23.80	117.36	0.20
+1.20D+1.60Lr					
Span # 1	1	24.706	38.60	117.36	0.33
+1.20D+1.60Lr+0.50W					
Span # 1	1	24.706	61.87	117.36	0.53
+1.20D+1.60Lr-0.50W					
Span # 1	1	24.706	15.33	117.36	0.13
+1.20D+1.60S					
Span # 1	1	24.706	59.18	117.36	0.50
+1.20D+1.60S+0.50W					
Span # 1	1	24.706	82.44	117.36	0.70
+1.20D+1.60S-0.50W					
Span # 1	1	24.706	35.91	117.36	0.31
+1.20D+0.50Lr+W					
Span # 1	1	24.706	63.91	117.36	0.54
+1.20D+0.50Lr-W					
Span # 1	1	90.588	22.40	117.36	0.19
+1.20D+0.50S+W					
Span # 1	1	24.706	70.34	117.36	0.60
+1.20D+0.50S-W					
Span # 1	1	90.588	20.25	117.36	0.17
+0.90D+W					
Span # 1	1	24.706	52.31	117.36	0.45
+0.90D-W					
Span # 1	1	90.588	26.58	117.36	0.23
+1.20D+0.20S+E					
Span # 1	1	24.706	16.85	117.36	0.14
+0.90D+E					
Span # 1	1	24.706	8.46	117.36	0.07

Overall Maximum Deflections - Unfactored Lo

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
Span 1	1	0.0311	0.000		0.0000	0.000

Detailed Shear Information

Load Combination	Span Number	Distance (ft)	'd' (in)	Vu (k) Actual	Design	Mu (k-ft)	d*Vu/Mu	Phi*Vc (k)	Comment	Phi*Vs (k)	Spacing (in) Req'd	Suggest
+1.20D+0.50S+W	1	0.00	27.00	1.90	1.90	0.00	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+0.50S+W	1	1.18	27.00	4.36	4.36	1.61	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+0.50S+W	1	2.35	27.00	-7.70	7.70	8.43	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+0.50S+W	1	3.53	27.00	-5.81	5.81	18.12	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+0.50S+W	1	4.71	27.00	-4.18	4.18	25.58	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+0.50S+W	1	5.88	27.00	-2.78	2.78	31.12	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00
+0.90D-W	1	7.06	27.00	1.83	1.83	24.43	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00
+0.90D-W	1	8.24	27.00	1.07	1.07	25.95	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00
+0.90D+W	1	9.41	27.00	0.60	0.60	32.37	0.56	59.66	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+0.50S+W	1	10.59	27.00	1.36	1.36	38.79	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+0.50S+W	1	11.76	27.00	2.25	2.25	37.82	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+0.50S+W	1	12.94	27.00	3.17	3.17	35.80	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+0.50S+W	1	14.12	27.00	4.17	4.17	32.69	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	15.29	27.00	5.37	5.37	27.17	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	16.47	27.00	6.86	6.86	21.49	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	17.65	27.00	8.57	8.57	14.04	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	18.82	27.00	10.52	10.52	4.59	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	20.00	27.00	12.71	12.71	7.16	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	21.18	27.00	15.13	15.13	21.48	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	22.35	27.00	17.75	17.75	38.65	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	23.53	27.00	20.54	20.54	58.91	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	24.71	27.00	23.40	23.40	82.44	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	25.88	27.00	-19.06	19.06	69.36	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	27.06	27.00	-16.29	16.29	46.32	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	28.24	27.00	-13.67	13.67	26.53	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	29.41	27.00	-11.24	11.24	9.81	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	30.59	27.00	-9.00	9.00	4.03	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00

Beam on Elastic Foundation

Project File: ABC Bldg 4 Reclamation small half - [100x70].ec6

LIC# : KW-06012917, Build:20.23.08.30 Alpine Engineering, LLC

DESCRIPTION: Grid D1 - Composite Section

Detailed Shear Information

Load Combination	Span Number	Distance (ft)	'd' (in)	Vu Actual	(k) Design	Mu (k-ft)	d*Vu/Mu	Phi*Vc (k)	Comment	Phi*Vs (k)	Spacing (in) Req'd	Suggest
+1.20D+1.60S+0.50W	1	31.76	27.00	-6.95	6.95	15.25	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	32.94	27.00	-5.07	5.07	24.05	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	34.12	27.00	-3.34	3.34	30.64	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	35.29	27.00	-1.72	1.72	35.20	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00
+0.90D-W	1	36.47	27.00	0.90	0.90	18.49	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	37.65	27.00	1.38	1.38	38.66	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	38.82	27.00	2.94	2.94	37.67	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	40.00	27.00	4.57	4.57	34.84	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	41.18	27.00	6.31	6.31	30.09	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	42.35	27.00	8.20	8.20	23.30	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	43.53	27.00	10.26	10.26	14.28	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	44.71	27.00	12.51	12.51	2.85	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	45.88	27.00	14.95	14.95	11.24	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	47.06	27.00	17.57	17.57	28.20	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	48.24	27.00	20.34	20.34	48.25	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	49.41	27.00	23.19	23.19	71.55	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	50.59	27.00	-19.27	19.27	71.55	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	51.76	27.00	-16.51	16.51	48.25	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	52.94	27.00	-13.88	13.88	28.20	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	54.12	27.00	-11.44	11.44	11.24	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	55.29	27.00	-9.19	9.19	2.85	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	56.47	27.00	-7.13	7.13	14.28	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	57.65	27.00	-5.24	5.24	23.30	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	58.82	27.00	-3.50	3.50	30.09	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	60.00	27.00	-1.87	1.87	34.84	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00
+0.90D-W	1	61.18	27.00	0.94	0.94	18.44	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	62.35	27.00	1.22	1.22	38.66	0.95	61.03	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	63.53	27.00	2.78	2.78	37.85	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	64.71	27.00	4.41	4.41	35.20	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	65.88	27.00	6.14	6.14	30.64	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	67.06	27.00	8.01	8.01	24.05	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	68.24	27.00	10.06	10.06	15.25	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	69.41	27.00	12.30	12.30	4.03	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	70.59	27.00	14.74	14.74	9.81	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	71.76	27.00	17.36	17.36	26.53	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	72.94	27.00	20.12	20.12	46.32	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	74.12	27.00	22.98	22.98	69.36	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	75.29	27.00	-19.47	19.47	82.44	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	76.47	27.00	-16.69	16.69	58.91	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	77.65	27.00	-14.06	14.06	38.65	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	78.82	27.00	-11.64	11.64	21.48	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	80.00	27.00	-9.45	9.45	7.16	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	81.18	27.00	-7.50	7.50	4.59	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	82.35	27.00	-5.79	5.79	14.04	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	83.53	27.00	-4.30	4.30	21.49	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+0.50S+W	1	84.71	27.00	-3.11	3.11	28.41	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00
+0.90D-W	1	85.88	27.00	2.38	2.38	21.90	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00
+0.90D-W	1	87.06	27.00	1.82	1.82	24.07	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00
+0.90D-W	1	88.24	27.00	1.25	1.25	25.59	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S-0.50W	1	89.41	27.00	1.06	1.06	6.96	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	90.59	27.00	1.85	1.85	35.81	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+1.60S+0.50W	1	91.76	27.00	2.78	2.78	34.26	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+0.50S+W	1	92.94	27.00	3.84	3.84	35.02	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+0.50S+W	1	94.12	27.00	5.25	5.25	31.12	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+0.50S+W	1	95.29	27.00	6.88	6.88	25.58	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+0.50S+W	1	96.47	27.00	8.76	8.76	18.12	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00
+1.20D+0.50S+W	1	97.65	27.00	10.93	10.93	8.43	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00
+0.90D-W	1	98.82	27.00	1.58	1.58	1.23	1.00	61.20	Vu < PhiVc/2	Not Reqd	0.00	0.00

PROJECT:	ABC BUILDING 4 RECLAMATION
LOCATION:	WHATCOM COUNTY, WA
CLIENT:	TRC
ENGR:	SMW
JOB #:	20004
DATE:	10/4/2023

ALPINE ENGINEERING, LLC

PEMB Column Reactions & Load Combinations

Load Combinations per ASCE 7-10

ASD Load Combinations		LRFD Load Combinations		PEMB Reaction definitions	
1	D	1	1.4D	D + Coll	Total Dead Load
2	D+L	2	1.2D+1.6L+0.5(Lr or S or R)	W+	Wind acting inward
3	D+(Lr or S or R)	3	1.2D+1.6(Lr or S or R)+(L or 0.5W)	W-	Wind acting outward (suction)
4	D+0.75L+0.75(Lr or S or R)	4	1.2D+1.0W+L+0.5(Lr or S or R)	E+	Seismic acting inward
5	D+(0.6W or 0.7E)	5	1.2D+1.0E+L+0.2S	E-	Seismic acting outward
6a	D+0.75L+0.75(0.6W)+0.75(Lr or S or R)	6	0.9D+1.0W	W (max)	Total concurrent Wind Loading, worst case
6b	D+0.75L+0.75(0.6E)+0.75S	7	0.9D+1.0E		
7	0.6D+0.6W				
8	0.6D+0.7E				

		Horiz								Vert								Out-of-plane		ASD load combos		
																				Max	Max	Max
Grid		D	Coll	Snow	L	E	W (max)	RS	LS	D	Coll	Snow	L	E	W (max)	RS	LS	E	W (max)	Horiz	Vert	OOP
1	A	0	0	0.2	0.1	-0.7	-6.5	0.1	0.1	1.1	0.5	3	1.8	-1.1	-11.4	0.8	2.5	*3*	*5.8*	3.9	9.0	*3.5*
1	B	0	0	0	0	0	0	0	0	1.5	0.9	6.2	3.7	-1.4	-11.2	2.2	7.3	*3*	*5.8*	0.0	12.9	*3.5*
1	C	0	0	0	0	0	0	0	0	1.5	0.9	6.2	3.7	-1.4	-11.2	7.3	2.2	*3*	*5.8*	0.0	12.9	*3.5*
1	D	0	0	-0.2	-0.1	-0.7	6.5	-0.1	-0.1	1.1	0.5	3	1.8	-1.1	-11.4	2.5	0.8	*3*	*5.8*	3.9	9.0	*3.5*
2*	A	1.1	1	6.7	4	-1.3	-12.6	5	5	3.6	2.6	17.5	10.5	-3.6	-26	8.8	15.4	*3*	*5.8*	*12.8*	31.0	*3.5*
2*	D	-1.1	-1	-6.7	-4	-1.3	12.6	-5	-5	3.6	2.6	17.5	10.5	-3.6	-26	15.4	8.8	*3*	*5.8*	6.3	*31.0*	*3.5*

2 Corresponds to Frames at Grids 2,3,4*

1 Corresponds to Frames at Grids 1,5*

PROJECT:	ABC BUILDING 4 RECLAMATION
LOCATION:	WHATCOM COUNTY, WA
CLIENT:	TRC
ENGR:	SMW
JOB #:	20004
DATE:	10/4/2023

ALPINE
ENGINEERING, LLC

Wind & Seismic Uplift Calculations:

		PEMB		UPLIFT	ASD UPLIFT		LRFD UPLIFT				
Grid		D+Coll	E	W	SEIS	WIND	SEIS	WIND		Down +	lateral
1	A	1.6	-1.1	-11.2	27.0	16.9	41.1	31.0	*OK*	16.9	6.7
2*	A	6.2	-3.6	-26	27.3	4.9	42.8	20.4	*OK*	4.9	22.47

Conc. Unit Weight	145	lb/cf
Fdn. Trib Length	30	ft
Fdn. Depth	30	in
Fdn. Width	30	in
Slab Trib. Area	250	sf
Slab Thickness	6	in
Total Trib. Fdn. Weight =	45.3	kips

2 Corresponds to Frames at Grids 2,3,4*
1 Corresponds to Frames at Grids 1,5*

Hairpin Tension Calculations:

fy hairpin = 60 ksi

Area Req'd = 0.416 in^2

Max Horiz. Force 22.47 kip

USE:
#5 Hairpin OR (2) #4 Hairpins

Anchor Designer™ Software
Version 3.2.2309.2

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Project:	Building 4		
Address:			
Phone:			
E-mail:			

1.Project information

Customer company:
Customer contact name:
Customer e-mail:
Comment:

Project description:
Location:
Fastening description:

2. Input Data & Anchor Parameters

General
Design method:ACI 318-14
Units: Imperial units

Anchor Information:
Anchor type: Cast-in-place
Material: AB_H
Diameter (inch): 0.750
Effective Embedment depth, h_{ef} (inch): 18.000
Anchor category: -
Anchor ductility: Yes
h_{min} (inch): 20.25
C_{min} (inch): 1.63
S_{min} (inch): 3.00

Base Material
Concrete: Normal-weight
Concrete thickness, h (inch): 30.00
State: Cracked
Compressive strength, f'_c (psi): 2500
$\Psi_{c,V}$: 1.0
Reinforcement condition: B tension, B shear
Supplemental edge reinforcement: Not applicable
Reinforcement provided at corners: No
Ignore concrete breakout in tension: No
Ignore concrete breakout in shear: No
Ignore 6do requirement: Yes
Build-up grout pad: No

Base Plate
Length x Width x Thickness (inch): 10.75 x 8.00 x 0.38

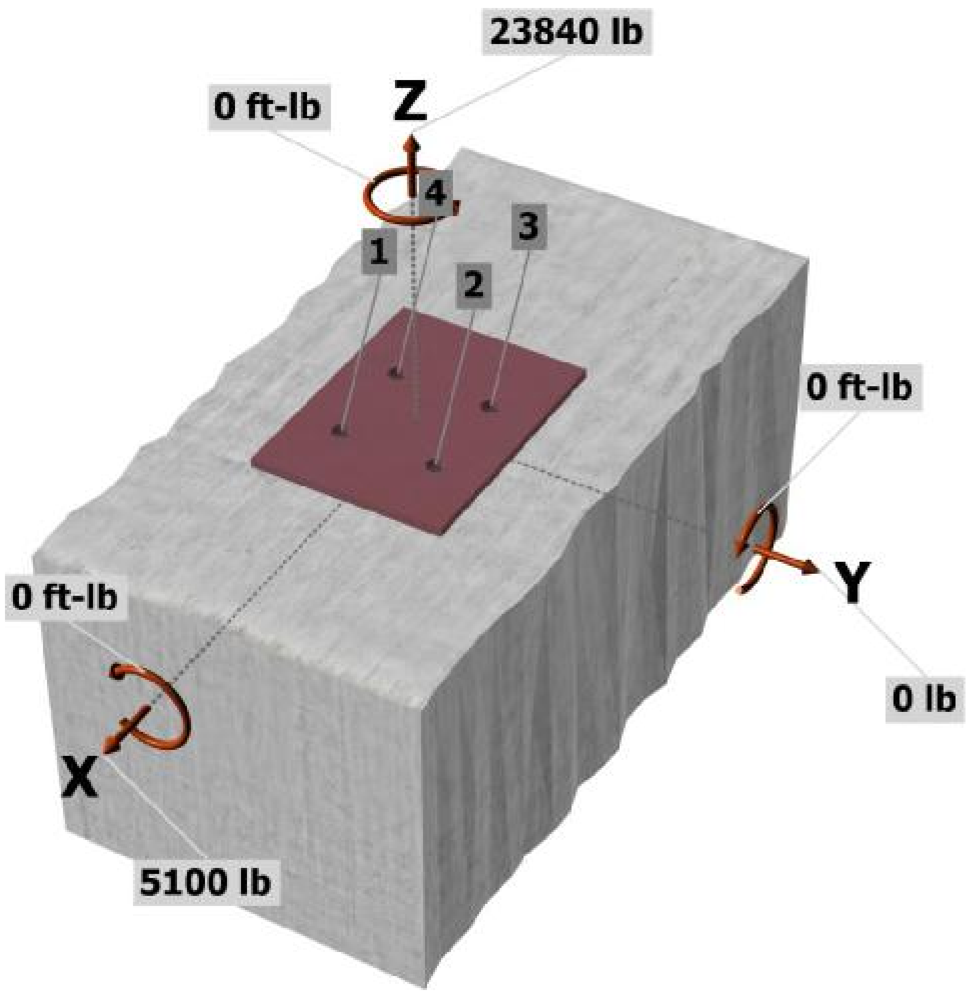
Recommended Anchor
Anchor Name: PAB Pre-Assembled Anchor Bolt - PAB6H (3/4"Ø)

Load and Geometry
Load factor source: ACI 318 Section 5.3
Load combination: not set
Seismic design: No
Anchors subjected to sustained tension: Not applicable
Apply entire shear load at front row: No
Anchors only resisting wind and/or seismic loads: No

Strength level loads:

N_{ua} [lb]: 23840
V_{uax} [lb]: 5100
V_{uay} [lb]: 0
M_{ux} [ft-lb]: 0
M_{uy} [ft-lb]: 0
M_{uz} [ft-lb]: 0

<Figure 1>



Anchor Designer™
Software
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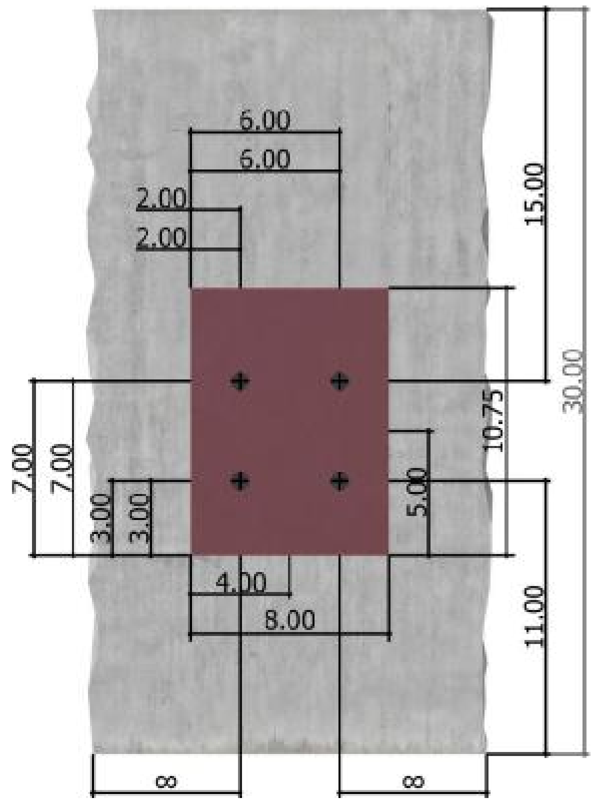
<Figure 2>



Anchor Designer™
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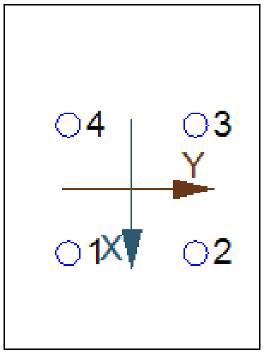
3. Resulting Anchor Forces

Anchor	Tension load, N_{ua} (lb)	Shear load x, V_{uax} (lb)	Shear load y, V_{uay} (lb)	Shear load combined, $\sqrt{(V_{uax})^2+(V_{uay})^2}$ (lb)
1	5960.0	1275.0	0.0	1275.0
2	5960.0	1275.0	0.0	1275.0
3	5960.0	1275.0	0.0	1275.0
4	5960.0	1275.0	0.0	1275.0
Sum	23840.0	5100.0	0.0	5100.0

Maximum concrete compression strain (‰): 0.00
Maximum concrete compression stress (psi): 0
Resultant tension force (lb): 23840
Resultant compression force (lb): 0
Eccentricity of resultant tension forces in x-axis, e'_{Nx} (inch): 0.00
Eccentricity of resultant tension forces in y-axis, e'_{Ny} (inch): 0.00
Eccentricity of resultant shear forces in x-axis, e'_{Vx} (inch): 0.00
Eccentricity of resultant shear forces in y-axis, e'_{Vy} (inch): 0.00

<Figure 3>



4. Steel Strength of Anchor in Tension (Sec. 17.4.1)

N_{sa} (lb)	ϕ	ϕN_{sa} (lb)
40080	0.75	30060

5. Concrete Breakout Strength of Anchor in Tension (Sec. 17.4.2)

$N_b = 16\lambda_a\sqrt{f'_c}h_{ef}^{5/3}$ (Eq. 17.4.2.2b)

λ_a	f'_c (psi)	h_{ef} (in)	N_b (lb)
1.00	2500	18.000	98903

$\phi N_{cbg} = \phi\,(A_{Nc}/A_{Nco})\,\Psi_{ec,N}\,\Psi_{ed,N}\,\Psi_{c,N}\,\Psi_{cp,N}N_b$ (Sec. 17.3.1 & Eq. 17.4.2.1b)

A_{Nc} (in^2)	A_{Nco} (in^2)	$c_{a,min}$ (in)	$\Psi_{ec,N}$	$\Psi_{ed,N}$	$\Psi_{c,N}$	$\Psi_{cp,N}$	N_b (lb)	ϕ	ϕN_{cbg} (lb)
1807.50	2916.00	11.00	1.000	0.822	1.00	1.000	98903	0.70	35285

6. Pullout Strength of Anchor in Tension (Sec. 17.4.3)

$\phi N_{pn} = \phi\Psi_{c,P}N_p = \phi\Psi_{c,P}8A_{brg}f'_c$ (Sec. 17.3.1, Eq. 17.4.3.1 & 17.4.3.4)

$\Psi_{c,P}$	A_{brg} (in^2)	f'_c (psi)	ϕ	ϕN_{pn} (lb)
1.0	3.53	2500	0.70	49476

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8. Steel Strength of Anchor in Shear (Sec. 17.5.1)

V_{sa} (lb)	ϕ_{grout}	ϕ	$\phi_{grout}\phi V_{sa}$ (lb)
24050	1.0	0.65	15633

9. Concrete Breakout Strength of Anchor in Shear (Sec. 17.5.2)

Shear perpendicular to edge in x-direction:

$V_{bx} = \min|7(l_e / d_a)^{0.2}\sqrt{d_a}\lambda_a\sqrt{f'_c}c_{a1}^{1.5};\ 9\lambda_a\sqrt{f'_c}c_{a1}^{1.5}|$ (Eq. 17.5.2.2a & Eq. 17.5.2.2b)

l_e (in)	d_a (in)	λ_a	f'_c (psi)	c_{a1} (in)	V_{bx} (lb)
6.00	0.750	1.00	2500	15.00	26143

$\phi V_{cbgx} = \phi\ (A_{Vc} / A_{Vco})\ \Psi_{ec,V}\Psi_{ed,V}\Psi_{c,V}\Psi_{h,V}V_{bx}$ (Sec. 17.3.1 & Eq. 17.5.2.1b)

A_{Vc} (in^2)	A_{Vco} (in^2)	$\Psi_{ec,V}$	$\Psi_{ed,V}$	$\Psi_{c,V}$	$\Psi_{h,V}$	V_{bx} (lb)	ϕ	ϕV_{cbgx} (lb)
1102.50	1012.50	1.000	1.000	1.000	1.000	26143	0.70	19926

10. Concrete Pryout Strength of Anchor in Shear (Sec. 17.5.3)

$\phi V_{cpg} = \phi k_{cp}N_{cbg} = \phi k_{cp}(A_{Nc} / A_{Nco})\ \Psi_{ec,N}\Psi_{ed,N}\Psi_{c,N}\Psi_{cp,N}N_b$ (Sec. 17.3.1 & Eq. 17.5.3.1b)

k_{cp}	A_{Nc} (in^2)	A_{Nco} (in^2)	$\Psi_{ec,N}$	$\Psi_{ed,N}$	$\Psi_{c,N}$	$\Psi_{cp,N}$	N_b (lb)	ϕ	ϕV_{cpg} (lb)
2.0	1807.50	2916.00	1.000	0.822	1.000	1.000	98903	0.70	70570

11. Results

Interaction of Tensile and Shear Forces (Sec. 17.6)

Tension	Factored Load, N_{ua} (lb)	Design Strength, ϕN_n (lb)	Ratio	Status
Steel	5960	30060	0.20	Pass
Concrete breakout	**23840**	**35285**	**0.68**	**Pass (Governs)**
Pullout	5960	49476	0.12	Pass

Shear	Factored Load, V_{ua} (lb)	Design Strength, ϕV_n (lb)	Ratio	Status
Steel	1275	15633	0.08	Pass
T Concrete breakout x+	**5100**	**19926**	**0.26**	**Pass (Governs)**
Pryout	5100	70570	0.07	Pass

Interaction check	$N_{ua}/\phi N_n$	$V_{ua}/\phi V_n$	Combined Ratio	Permissible	Status
Sec. 17.6.1	0.68	0.00	67.6%	1.0	Pass

PAB6H (3/4"Ø) with hef = 18.000 inch meets the selected design criteria.

12. Warnings

- Minimum spacing and edge distance requirement of 6da per ACI 318 Sections 17.7.1 and 17.7.2 for torqued cast-in-place anchor is waived per designer option.

- Designer must exercise own judgement to determine if this design is suitable.