

Oregon Seismic Status Report - 2018



Oregon law requires school districts and education service districts to provide DOGAMI with notice of construction projects that may affect a school's seismic risk.

This report was generated by DOGAMI from submitted data.

School District/ESD: Hillsboro 1J

County: WASHINGTON

Contact Name: Casey Waletich

Contact Email: waleticc2hsd.k12.or.us

Structures Replaced? No

Name and Address:

Kind of Structure:

Type of
Replacement:

Max Occupancy:

Date Occupied:

Structures Modified? Yes

Name and Address: Reedville Elementary School 2695 SW 209th Aloha, OR 97003 North Plains Elementary School 32030 NW North Ave N. Plains, OR

Kind of Structure: Reedville- Complete main building remodel
N. Plains- Roofing Upgrade

Type of Modification: See Drawings

Date Re-occupied: 9/4/2018

Optional:

Engineering Report? Yes *If yes, attachments are appended to this report.*

Cost of Rehab: \$1,160,508 Reedville
\$707,915 N. Plains

Method of Funding: Bond Program

Notes:

Submission Date: 08/09/18

mahlum

71 COLUMBIA FLOOR 4
SEATTLE WA 98104
TEL: (206) 441-9475 FAX:

151 NW 40TH | SUITE 102
PORTLAND OR 97209
(503) 224-6032 OFFICE
(503) 224-0918 FAX
MAHLUM ARCHITECTS INC



HILLSBORO SCHOOL DISTRICT
REEDVILLE ELEMENTARY
SCHOOL
2695 SW 209TH AVENUE
BEAVERTON OR 97006



MARK	DATE	DESCRIPTION
BIDD DATE:	16 MARCH 2018	BID SET
ISSUED TO:	STATE	BANK
ISSUED BY:	STATE	BANK
ISSUED FOR:	STATE	BANK

COVER SHEET

G-001



REEDVILLE ELEMENTARY SCHOOL
HILLSBORO SCHOOL DISTRICT
2695 SW 209TH AVENUE
BEAVERTON, OR 97006

BID SET
16 MARCH 2018

0 1 2 3 4 5 6

Project Name: *Hillsboro SD 1J,
North Plains Elementary Roof Replacement*

Address: *North Plains Elementary
32030 NW North Ave.
North Plains, Oregon*

Meeting: *Pre-Construction Meeting*

Time and Date: *2:30 PM, Friday, June 8, 2018*



2.01. Sign in of attendees.

2.02. Introduction of attendees and discussion of attendee's roles.

2.03. Recommended meeting format.

2.04. Descriptive summary of the scope of work.

SCOPE OF WORK

A. North Plains Elem, Area 1:

1. Remove existing roof membrane and insulation to deck.
2. Remove perimeter metal flashing and coping and dispose of.
3. Expose deck on adjacent roof area 3 to allow for seismic upgrades per drawings.
4. Demo existing curbs for attic ventilators and infill hole with decking to match existing.
5. Box in sleeper curbs under condenser units and add 3/4" plywood on top.
6. Inspect existing decking and notify owner of any rotted or deteriorated decking.
7. Install fall arrest tie off posts per engineering drawings.
8. Install seismic upgrades per Engineer's Drawings
9. Re-nail any loose decking.
10. Completely remove aggregate surfacing form existing membrane for 30" back from cut in roof on area 3, and prime to receive tie in plies.
11. Loose lay 28 lb G2 base sheet over rosin paper over entire deck.
12. Mechanically attach 2 layers of 1.8" Iso insulation at 16 fasteners per board. Increase fastening pattern at edges and corners per FM 1-49 recommendations.
13. Adhere 1/2" coated wood fiber board over base layer of Iso insulation.
14. Install 2 plies of heat stabilized polyester ply sheet set in Type IV asphalt.
15. Install an additional 2 plies of type VI fiberglass ply sheet set in Type IV asphalt.
16. Five course permanent tie in on area 3.
17. Reinforce all base flashing details with 1 ply of polyester felt set in Type IV asphalt.

- 18. Install TRA elastomeric base flashing with reflective aluminum coating.
- 19. Allow roof system to age for minimum of 7 days and install aggregate surface in cold applied adhesive.
- 20. Install new Stainless steel pitch pans with goose neck cap on coolant lines.
- 21. Install new perimeter coping with skirt flashing.
- 22. Install new curb caps on boxed curbs.
- 23. Install new stainless steel vent base.
- 24. Reinstall J vents.

2.05 Safety and security:

- a. **Owner comments on safety and security.**
- b. **MSDS, safety checklist & safety plan on-site:**

2.06 Construction administration checklist:

- a. **Contract executed?** Yes No **Comments, if any** _____.
- a. **Construction Schedule received?** Yes No **Comments, if any** _____.
- c. **Submittals received?** Yes No **Comments, if any** _____.
- d. **Bonds received?** Yes No **Comments, if any** _____.
- e. **Security & Badging Info?** Yes No **Comments, if any** _____.

2.07 Anticipated project schedule and start date(s).

- a. **Mobilization and deliveries.**
- b. **Sequencing of construction by task and area.**
- c. **Anticipated date of completion.**
- d. **Impact of rain or inclement weather could have upon construction.**
- e. **Questions concern or comments relative to the anticipated schedule?**

2.08 Construction points of contact:



a. Primary point(s) of contact and coordination.

- 1) Owner: Rick Cunningham (510) 770-4771 - cell (503) 844-1340 Office.
- 2) Contractor: _____.
- 3) Foreman: _____.
- 4) Tremco: Steve Ingram (503) 380-8536.
- 5) Contractual or Administrative: Adam Stewart (503) 844-1340.
- 6) Inspector: _____.
- 7) Frequency of communication between contractor and:
 - a. Owner: Daily Yes No - Weekly Yes No
 - b. Project Mgr. : Daily Yes No - Weekly Yes No
 - c. Other: _____.

2.09 Use of premises:

- a. Set up area, equipment and material storage: _____.
- b. Traffic flow comments _____.
- c. Material deliveries, handling, storage and tarping.
- d. Review of protection of interior, exterior and grounds.
- e. Housekeeping and cleanliness.

2.11 Considerations of construction.

- a. Establishment of acceptable working days and hours:
- b. Noise concerns.
- c. Moisture management.
- d. Distribution of loads on roof deck.

- e. Control of application Quantities.
- f. Number of crews: _____. Estimated crew size(s): _____.

2.12 Discussion of appropriate conduct and personal manners:

- a. Appropriate dress.
- b. Access to the interior of the building.
- c. Sanitary facilities. Where to place? _____.
- d. Lunch and break areas (designated areas): _____.
- e. Tobacco products allowed? Yes No If yes, where? _____.

2.14 Unforeseen Conditions:

- a. Unforeseen conditions that could impact progress of the cost of the project should quickly be brought to the construction teams' attention.
- b. Upon discovery, digitally photograph the condition for confirmation, further discussion and direction from the construction team.
- c. Development of RFI's and Change orders.

2.15 Discussion regarding progress meetings other than the daily communication with Facility Foreman & Project QAQC Manager.

- a. Frequency, date and time? _____.

2.16 Suggestions, comments, concerns or other relevant topics for discussion:

2.17 Project walk and inspection of the areas designated for construction (optional for some parties).



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 www.miller-ee.com

SEISMIC UPGRADE
 NORTH PLAINS ELEMENTARY SCHOOL
 TREMCO, INC
 3220 NW NORTH AVENUE
 NORTH PLAINS, OREGON

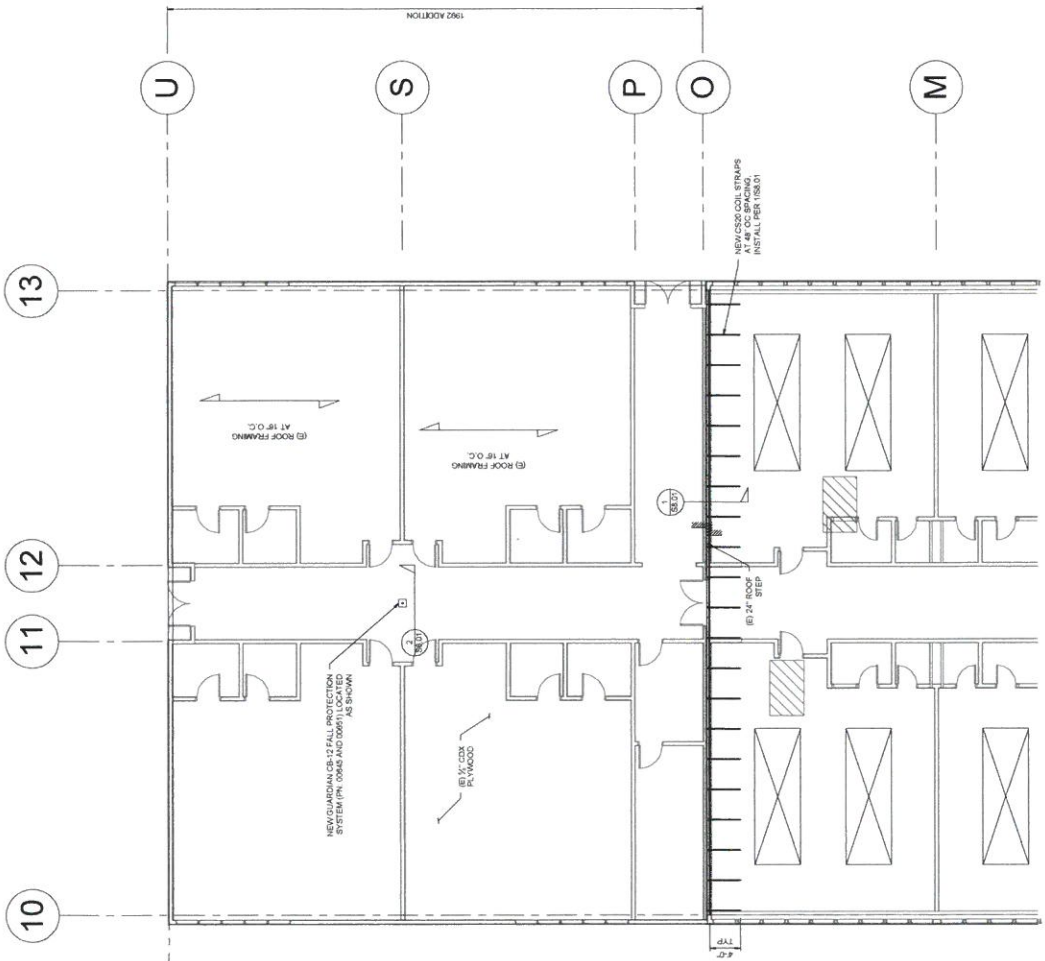
DESIGNED BY	BOB
CHECKED BY	L.P.
PROJECT NO.	111500
ISSUE DATE	02/27/2018
DESCRIPTION	
DATE	
REV	

SHEET CONTENT
 ROOF PLAN AT 1992
 ADDITION

SHEET
S1.02

FALL PROTECTION SYSTEMS SHALL BE INSTALLED UNDER THE SUPERVISION OF A LICENSED PROFESSIONAL ENGINEER. THE SYSTEM SHALL BE DESIGNED TO RESIST A MINIMUM ARRESTING FORCE OF 1,800 LBS. TO THE EXISTING ROOF STRUCTURE HAS BEEN DESIGNED FOR 3000 LBS PER OSHA 1926.502(b)(15)

Digitally signed by Lane P. Jobs
 DN: cn=Lane P. Jobs, o=Miller Consulting Engineers, ou=Miller Consulting Engineers, email=lane@mler-ee.com, c=US
 Date: 2018.02.27 10:59:47 -0800



1 S1.02
ROOF PLAN AT 1992 ADDITION
 1/8" = 1'-0"

LINE IS 2 INCHES AT FULL SCALE
 # NOT TO SCALE ACCORDING TO

Date: 3/16/18

Re: ADDENDUM No.1
Hillsboro School District
4901 SE Witch Hazel Rd
Hillsboro, OR 97123

Project: North Plains Elementary School Roof Area 1
Hillsboro High School Roof Area 17
Peter Boscow Center Roof Areas 1 - 8
LC Tobias Elementary School Roof Areas 2 - 15
Roof Replacement and Restoration Projects

To All Concerned,

The original documents for the above referenced project are hereby amended as noted herein.

ADDENDUM No. 1

The following are Revisions to the above referenced Roof Replacement & Restoration Specifications Dated February, 2018:

A. CLARIFICATIONS

1. All Four Sites –
 - a. Start Date – June 16, 2018.
 - (1) Boscow Center – Safety setup and roof cleaning scheduling possible prior to June 13, 2018.
 - b. Substantial Completion Date – September 3rd, 2018.
 - c. No work activities while school is in session after September 4, 2018.
 - d. Revised Bid Forms attached.
 - e. Bid Due Date updated to March 27, 2018, 1:00pm.
2. North Plains -
 - a. Revised seismic drawings delivered with additional information for strap attachment. Alternate detail 1A/S8.01 added to drawing package.
3. Hillsboro High School -
 - a. Raise curbs and vents to accommodate new flashing heights.
 - b. Install new drain bowls at 4 remaining drain locations.
 - c. New construction drawing with proposed tapered layout submitted and attached.
4. Peter Boscow -
 - a. Wet insulation replacement – polyisocyanurate insulation and .5” fiber board to match existing insulation height, 1 ply Burmastic Composite Ply HT set in Burmastic SF adhesive.
 - b. Remove existing metal wall panels with scupper cut-outs to allow for coating

- application and reinstall after completed.
 - c. Remove all surface mounted reglet flashing and install flat, cross-broken wall metal with removable skirt.
 - d. Thermal scan requirement deleted from scope of work. HSD will scan the roofs separately.
5. LC Tobias -
- a. Wet insulation replacement – polyisocyanurate insulation and .5” fiber board to match existing insulation height, 1 ply Burmastic Composite Ply HT set in Burmastic SF adhesive.
 - b. Walkways to be applied using AlphaGuard BIO Top Coat.
 - c. Replace existing metal caps at sleeper curbs with new sheet metal caps.
 - d. Thermal scan requirement deleted from scope of work. HSD will scan the roofs separately.

B. ADDITIONAL WORK:

- 1. Peter Boscow –
 - a. Provide alternate price for installing new sheet metal coping and cross broken wall panels at roof area 5.
- 2. LC Tobias –
 - a. Provide alternate price for removal of existing sheet metal coping.

C. ADDITIONAL INFORMATION

- 1. North Plains -
 - a. Roof Area 3: Plywood Deck; .5” Wood Fiber; BUR, Flood Coat & Gravel



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EXHIBIT 2

STRUCTURAL CALCULATIONS

**North Plains Elementary School Seismic Improvements and Fall Protection
Work Area, 1992 Addition**

Address: 32030 NW North Avenue, North Plains

Client: Tremco Inc. Roofing and Building Maintenance

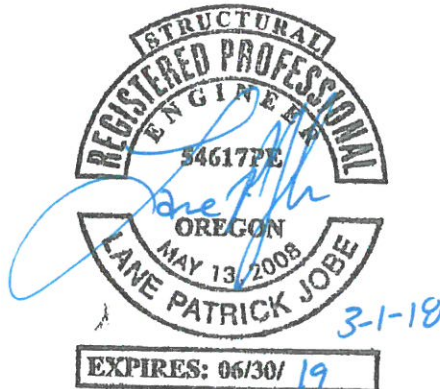
March 1, 2018

Project No. 171530

12 pages

Principal Checked: Kmm

THE CALCULATIONS ARE VOID IF SEAL



AND SIGNATURE ARE NOT ORIGINAL

***** LIMITATIONS *****

Miller Consulting Engineers, Inc. was retained in a limited capacity for this project. This design is based upon information provided by the client, who is solely responsible for accuracy of same. No responsibility and or liability is assumed by or is to be assigned to the engineer for items beyond that shown on these sheets.

Building Code: 2014 Oregon Structural Specialty Code
 Soils Report: No Soils Report by: N/A Dated: N/A
 Soil Bearing: 1500 PSF Retaining Walls: No
 Equivalent Fluid Pressure (active): N/A PCF Passive bearing: N/A PCF Friction: N/A
 Structural System: Building Structure
 Vertical System: Existing 1992 Construction Lateral Sys: Existing 1992 Construction

Basic Design Loads:	Element	Roof	Floor	Corridor	Garage
	Load Type	Dead	Dead	Dead	Dead
	Value (PSF)	15	15	15	10
	Load Type	Snow	Floor Live	Corridor Live	Deck Live
	Value (PSF)	25	40	100	40
	Deflection Criteria	L/240	L/360	L/360	L/360

Lateral Design Parameters:
 Wind Design: ASCE 7-10 Exposure C Wind Speed (3 sec Gust): 130 MPH

Importance Factors $I_w = \frac{1.00}{(\text{ice w/ wind})}$ $I_E = \frac{1.50}{(\text{seismic})}$ $I_S = \frac{1.20}{(\text{snow})}$ $I_i = \frac{1.25}{(\text{ice})}$ Risk Cat: IV

Seismic Design

Seismic design parameters are based on published values from the USGS web site.

Seismic Parameters from previous seismic upgrade calculations completed in 2012 are as follows:
 $S_{ds}=0.7$
 $S_{d1}=0.41$
 $S_s=0.938$
 $S_1=0.364$

Latitude: 45.602441
 Longitude: 123.006155

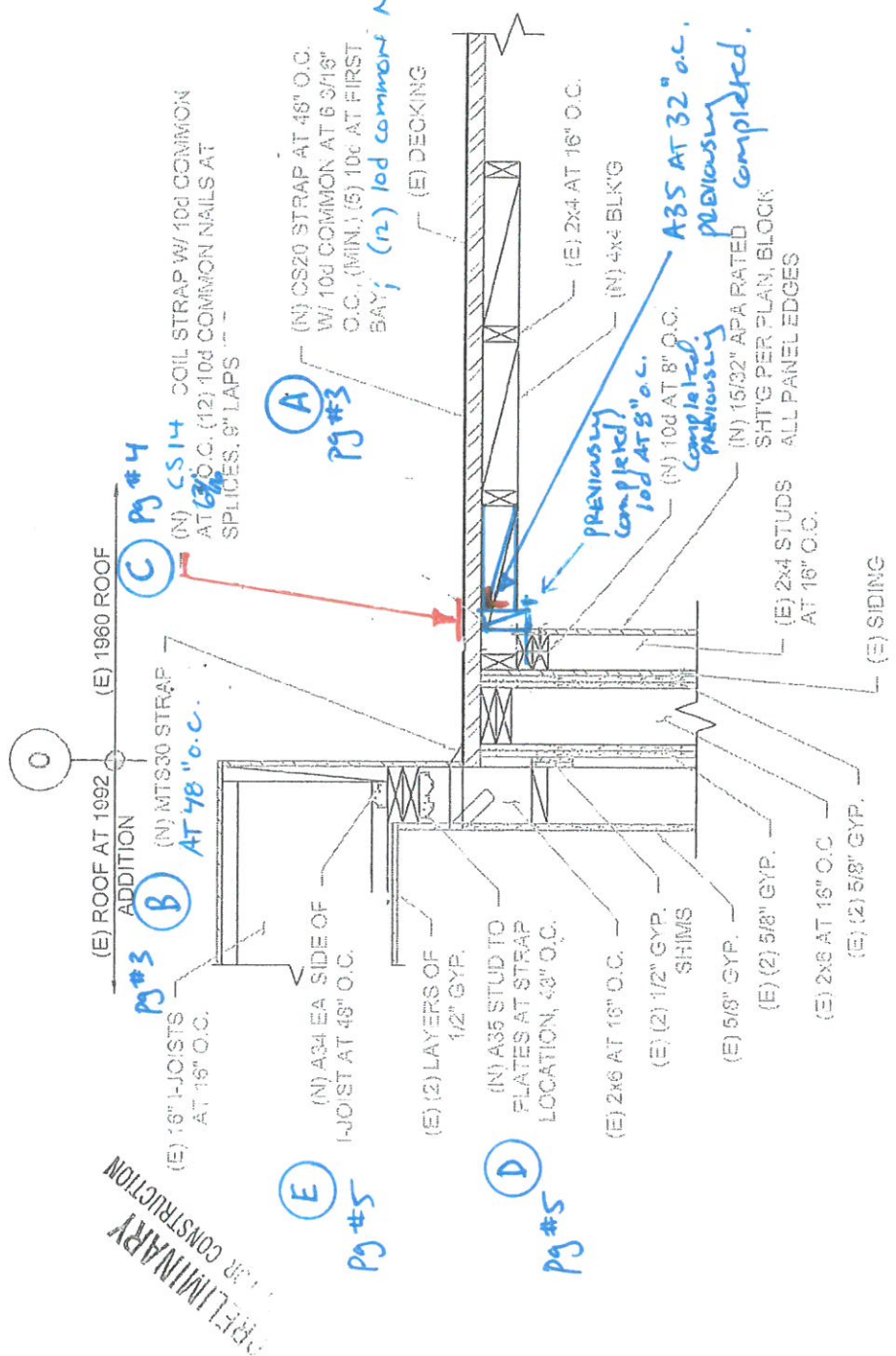
2% PE in 50 years, 0.2 sec SA = S_s
 2% PE in 50 years, 1.0 sec SA = S_1

(Site class B parameters are indicated on this page, for actual site class used in design, refer to seismic design summary)

Design Summary:

Scope: The enclosed structural engineering calculations include the seismic tie between the 1992 building addition and the 1960 building addition at the southwest area of the existing structure. The existing roof joists have been verified for the increased gravity loading from the proposed additional roof dead load (5.5 PSF) above the existing roof deck sheathing after the existing roofing dead load is removed. Additionally, a new single point fall protection system is proposed to be installed near the center of the existing roof for fall protection for future roof maintenance projects. Miller Consulting Engineers, Inc. has provided structural engineering services as related to this project only. Miller Consulting Engineers, Inc. is not responsible for waterproofing, flashing, protection of the building envelope or work as designed and/or provided by other building trades.

6 WS



X SECTION

3/4" = 1'-0"

SCHMATIC FOR ATTACHMENT LOCATIONS

1992 ADDITION TO TIE TO 1960 WEST WING

Roof MASS $\Rightarrow [36.25'(2) + 10'] [70.5'] [15 \text{ psf}] = 87,244 \#$

\perp WALLS $\Rightarrow (8 \text{ psf}) (13' \frac{1}{2}) (36.25') (3) = 5655 \#$

$\Sigma = 92899 \#$

MIN. TIE PER ASCE 7-10 12.1.3

$0.133 S_{DS} W_p$ OR $5\% W_p$

$0.2 S_{DS} W_p = (0.2)(0.7)(92899 \#) = 13006 \#$ ← CONTROLS

$0.05 W_p = (0.05)(92899 \#) = 4645 \#$

$F_p = 13006 \# / 82.5' \Rightarrow 158 \#/ft$

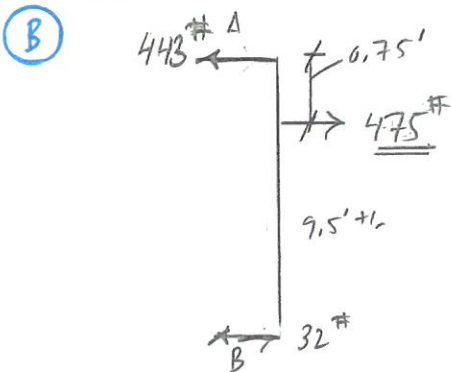
(A) TIES AT 4' o.c. $\Rightarrow F_p = 158 \#/ft (4') = 632 \#$ (USD)

$F_p = 632 \# (0.7) = 443 \#$ (ASD) $< 1030 \#$ $475 \# < 1030 \#$ o.k.

USE CS20 TIES AT 48" o.c. WITH MIN. 4'-0" LENGTH TO 1960 CONSTRUCTION

10d common $\Rightarrow Z' = 172 \#/\text{NAIL}$ (1030# / 6 NAILS)

$N_{REQ'D} = 443 \# / 172 \#/\text{NAIL} = 2.6 < 5$ USE (5) 10d common FIRST BAY




CHECK (N) MTS30 STRAP.

$F_p = 475 \# < 1000 \# \Rightarrow$ MTS30 WITH 10d x 1 1/2
 (7) 10d x 1 1/2 AT EA. SIDE o.k.

$F_p = 443 \# < 595 \#$ A35 CLIP. o.k.

USE MTS30 AT 48" o.c. WITH (14) 10d x 1 1/2 PER STRAP AND A35 CLIP AT 48" o.c.

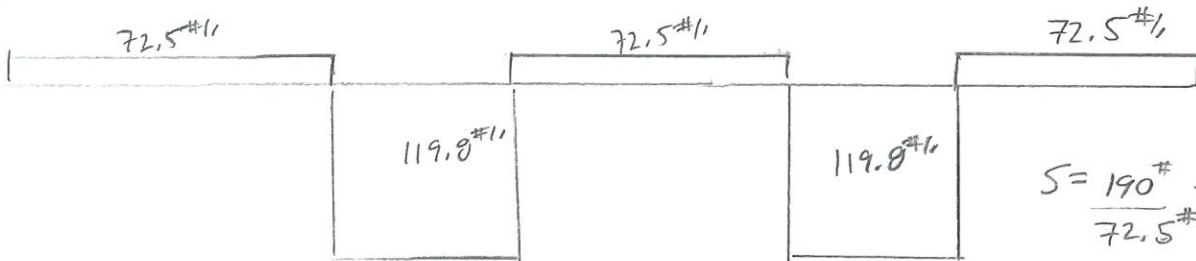
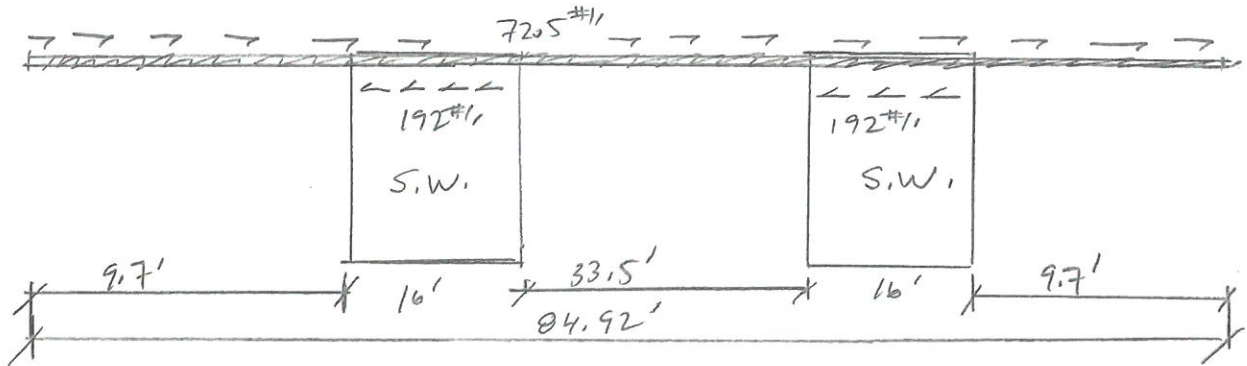
 MILLER CONSULTING ENGINEERS	9570 SW Barbur Blvd Suite One Hundred Portland, OR 97219-5412	Project Name <u>North Plains E.S.</u> Project # <u>171530</u>
	(503)246-1250 Fax: 246-1395	Location <u>32030 NW North Avenue, North Plains, Oregon</u>
		Client <u>Tremco Inc. Roofing and Building Maintenance</u>
		By <u>LPJ</u> Ck'd <u>Kenny</u> Date <u>3/1/2018</u> Page <u>3 of 12</u>

C

IN-PLANE DRAG STRUT

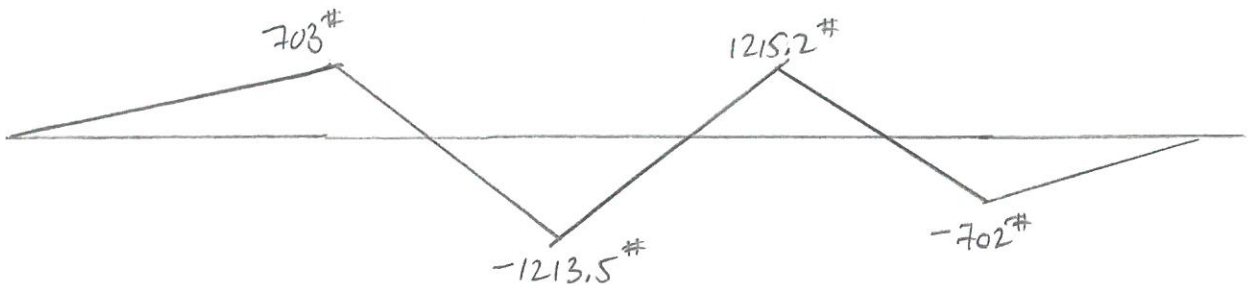
PREVIOUS CALCULATIONS DATED 1-24-13 (MCE 120780),
SHEARWALL ALONG GRIDLINE "O" $\Rightarrow V = 6154\#$ (Pg # 20 of 73)

$V_{DIA} = 6154\# / (04.92') = 72.5\#/\prime$



$S = \frac{190\#}{72.5\#/\prime} = 2.6'\text{ (31")}$
 $> 6\frac{3}{16}"\text{ o.c.}$

DRAG FORCE



DRAG FORCE $F_{MAX} = 1215\# < 2490\# \Rightarrow$ CS14

USE CS14 COIL STRAP WITH 10d COMMON
AT $6\frac{3}{16}"$ o.c. SPLICE MIN 9" LAP AS OCCURS
WITH (12) 10d.



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By LPJ Ck'd Kmm Date 3/1/2018 Page 4 of 12

D

$V = 475^\# < 695^\#$

\Rightarrow A35 CLIPS AT 48" o.c. O.K.

E

$V = 475^\# < 515^\#$, SINGLE

(N) A34 CLIP ONE SIDE OF
I-JOIST AT 48" o.c.



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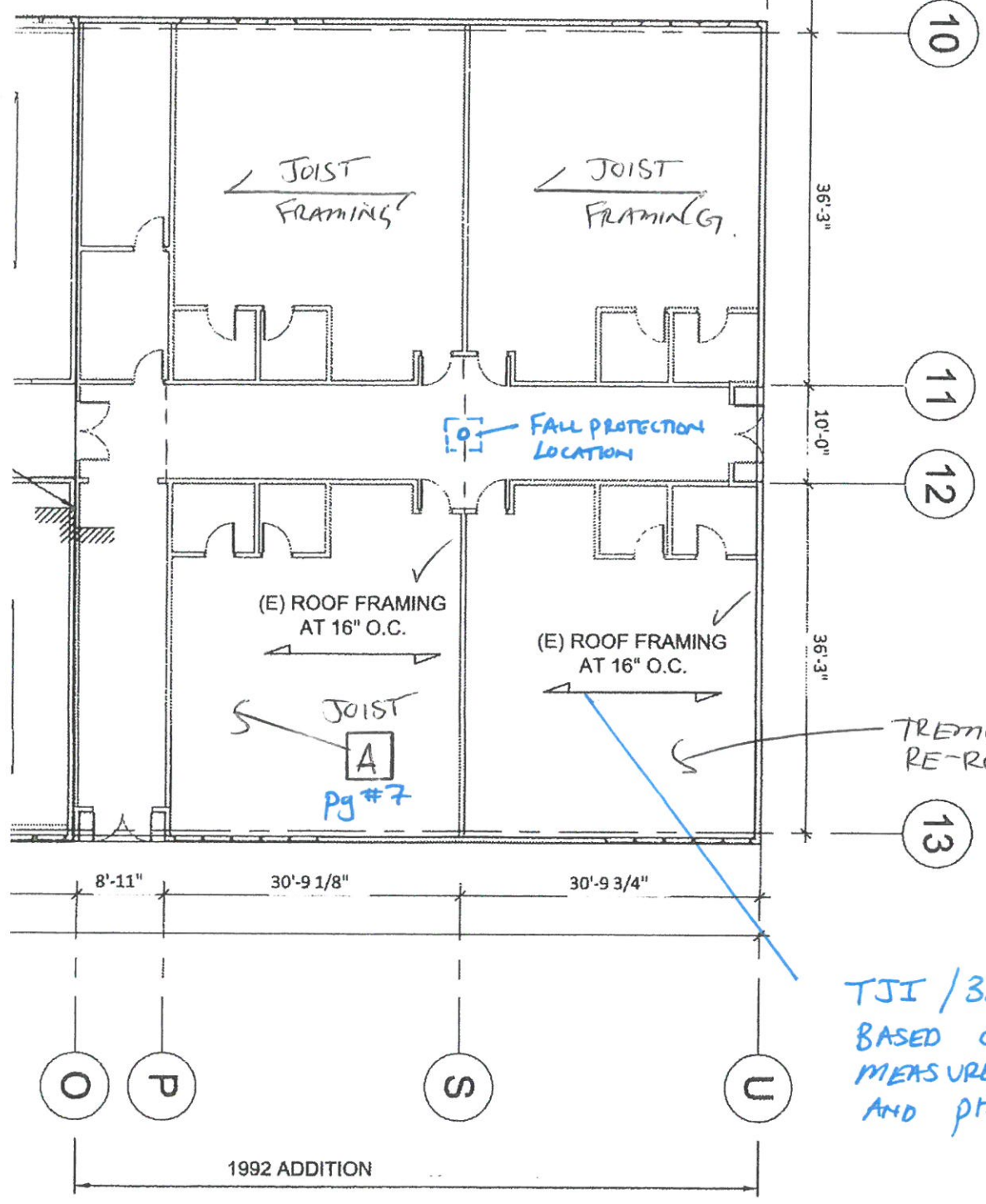
Project Name North Plains E.S. Project # 171530

Location 32030 NW North Avenue, North Plains, Oregon

Client Tremco Inc. Roofing and Building Maintenance

By LPJ Ck'd Kenn Date 3/1/2018 Page 5 of 12

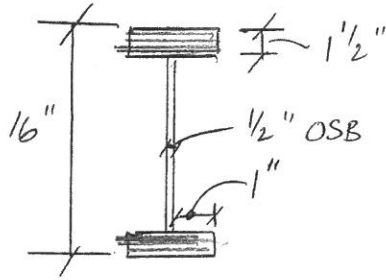
EXISTING
1992
NORTH PLAINS
BUILDING
ADDITION.



TJI / 35x DF
BASED ON
MEASUREMENTS
AND PHOTOS

EXISTING ROOF JOISTS 1992 ADDITION

JOIST
A



DIMENSION CONFIRMED
2-19-18, LPJ

EXISTING TJI/35XDF JOISTS
MOST LIKELY FROM THAT
PERIOD OF CONSTRUCTION THE
ROOF WAS CONSTRUCTED
SIDE OF JOIST INDICATED
THEY WERE "TRUSS JOIST"

EXISTING DL

5/8" SHTS ⇒ 1.8 psf

Joists ⇒ 4#/ft = 3 psf

5/8" GYP ⇒ 2.8 psf

Roofing 5 1/2 psf (ORIGINAL ROOF 2 1/4 psf)
PER TREMCO

MISC. 1.5 psf

1 psf INSULATION.

15.6 psf (USE 16 psf D.L)

25 psf S.L.

Σ = 41 psf ← TOTAL LOAD

JOISTS 16" o.c. ⇒ $V = 41 \text{ psf} (1.33') (30.58') = 834 \#$

$M = (41 \text{ psf}) (1.33) (30.58)^2 / 8 = 6375 \#'$

$V_{ALL} = 2435 \# > 834 \# \text{ o.k.}$

$M_{ALL} = 8615 \#' > 6375 \#' \text{ o.k.}$

915# > 834# NO WEB
STIFFENERS
REQ'D.

(FOR JOIST
CAPACITY, SEE
pg # 9 & 10)

$\Delta = 745 E6 \# \cdot \text{IN}^2$

$\Delta = \frac{22.5 (54.53) (30.12')^4}{745 E6} + \frac{2.67 (54.53) (30.12')^2}{16 \times 10^5} = 1.44" \quad L/251$



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By LPJ Ck'd kmr Date 3/1/2018 Page 7 of 12

EXISTING JOIST CAPACITY VERIFICATION

A CONT'D

APPEARS EXISTING ROOF JOISTS
MOST LIKELY TRUS JOIST
TJI / 35X DF ARE ACCEPTABLE
16" o.c. SPACING FOR REPLACEMENT
ROOF 5 1/2 PSF (DEAD LOAD ABX DECKING)



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By LPJ Ck'd Vossing Date 3/1/2018 Page 8 of 12

TJI Joist Section Properties

Joist Series	Depth (in.)	Maximum Resistive Moment (1)			Maximum Resistive Shear (2)			EI TJI Joist Only 10 ⁶ lbs. in. ²	EI (3) TJI Joist with Nailed Plywood Floor Sheathing 10 ⁶ lbs. in. ²	EI (3) TJI Joist with Gue-Nailed Plywood Floor Sheathing 10 ⁶ lbs. in. ²
		100%	115%	125%	100%	115%	125%			
		(Ft.-lbs.)	(Ft.-lbs.)	(Ft.-lbs.)	(lbs.)	(lbs.)	(lbs.)			
TJI/35X	10	4165	4790	5205	1565	1795	1955	250	284	312
TJI/35X	12	5270	6065	6585	1750	2010	2185	385	434	472
TJI/35X	14	6360	7340	7975	1935	2225	2415	550	615	667
TJI 35X	16	7490	8615	9360	2120	2435	2650	745	828	855
TJI/35X	18	8605	9900	10755	2305	2650	2880	970	1075	1158
TJI/35X	20	9725	11185	12155	2490	2860	3110	1230	1358	1460
TJI/35X	22	10845	12475	13555	2670	3070	3335	1524	1678	1801
TJI/35X	24	11965	13760	14955	2785	3200	3480	1950	2031	2177
TJI/35X	26	13065	15050	16355	2900	3335	3625	2115	2318	2461
TJI/35X	28	14205	16340	17755	2900	3335	3625	2515	2861	3057
TJI/35X	30	15330	17630	19160	2900	3335	3625	3055	3336	3562
TJI/55E	12	8180	9410	10225	1750	2010	2185	597	652	696
TJI/55E	14	9905	11395	12380	1935	2225	2415	854	927	986
TJI/55E	16	11640	13390	14550	2120	2435	2650	1161	1255	1332
TJI/55E	18	13375	15385	16715	2305	2650	2880	1519	1637	1732
TJI/55E	20	15120	17390	18900	2490	2860	3110	1931	2076	2192
TJI/55E	22	16860	19390	21075	2670	3070	3335	2397	2572	2711
TJI/55E	24	18610	21405	23260	2785	3200	3480	2919	3126	3290
TJI/55E	26	20360	23415	25450	2900	3330	3685	3499	3740	3929
TJI/55E	28	22110	25430	27635	3030	3480	3785	4140	4417	4633
TJI/55E	30	23855	27435	29815	3115	3580	3890	4340	5155	5397
TJI/55	12	10130	11650	12680	1750	2010	2185	716	773	819
TJI/55	14	12265	14105	15330	1935	2225	2415	1025	1132	1162
TJI/55	16	14410	16575	18010	2120	2435	2650	1393	1492	1571
TJI/55	18	16560	19045	20700	2305	2650	2880	1823	1947	2045
TJI/55	20	18720	21530	23400	2490	2860	3110	2317	2458	2590
TJI/55	22	20875	24010	26090	2670	3070	3335	2876	3057	3204
TJI/55	24	23040	26500	28800	2785	3200	3480	3503	3770	3892
TJI/55	26	25210	28995	31510	2950	3390	3685	4200	4452	4654
TJI/55	28	27375	31485	34215	3030	3480	3785	4968	5231	5490
TJI/55	30	29540	33975	36925	3115	3580	3890	5810	6141	6408

(1) Maximum Resistive Moment values may be increased 4% for repetitive member usage.
 (2) For possible increases in shear capability refer to NER 200.
 (3) For deflection calculation only.

Repetitive Member Design

Structural wood products used repetitively can be shown to share loads between adjacent members, increasing the total load carrying capacity of the system.

- 1) 3 or more members are adjacent.
- 2) Member spacing is 24" on center or less.
- 3) The members are joined by transverse load-distributing elements (decking) adequate to support the design load.

credit for repetitive member increases; therefore, it has been determined that the increase in flexure shall be 7% for products utilizing machine stress rated grades of solid sawn lumber and 4% for products utilizing MICRO=LAM lumber.

The criteria for increases in flexural stresses for repetitive member usage is as follows:

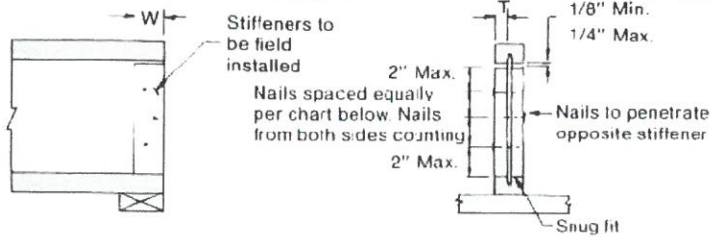
Products with greater consistency, such as MICRO=LAM lumber, logically are given less

increases, where appropriate, are so indicated in the load tables.

Legacy Literature
See Note on Front Cover

Web Stiffeners / Bearing Distances

Web Stiffener Attachment (See Web Stiffener Section of Table)

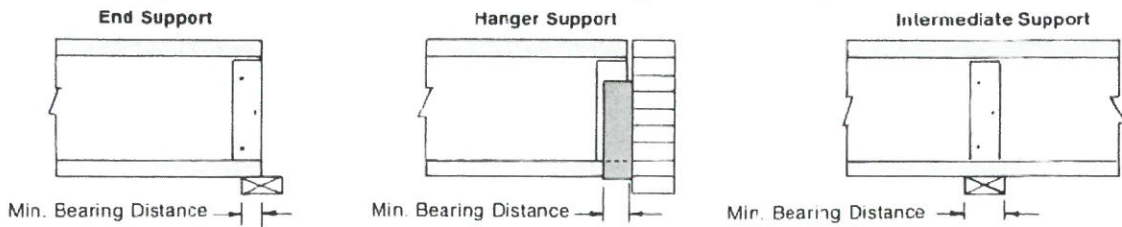


NOTE:

- Web stiffeners must be field installed at bearing points and concentrated loads as shown in the chart below.
- Gap must be at top at all bearing conditions. In the case of concentrated loads, the gap must be at the bottom.
- Web stiffeners are available from Trus Joist Corporation

Minimum Bearing Distance

(See Minimum Bearing Section of Table)



TJI Joist Depth / Series	Web Stiffener Requirements							Min. Bearing Distance			
	End Support or Hanger Support		Intermediate TJI Joist Support		Web Stiffeners Required at Concentrated Loads Greater Than (LBS.)	Number of Nails Required at Concentrated Load	Min. Web Stiffener Width "W" (Inches)	Min. Web Stiffener Thickness "T" (Inches)	End Support or Hanger Support ⁽²⁾ (Inches)	Intermediate TJI Joist ⁽¹⁾ Support (Inches)	
	Web Stiffeners Required?	Number of Nails Required	Web Stiffeners Required?	Number of Nails ⁽¹⁾ Required							
OSB Web	10 TJI 35X	Yes	3-8d	Yes	3-8d	605	2-8d	2-5/16"	3/8"	2"	3 1/2"
	12 TJI 35X	Yes	3-8d	Yes	3-8d	710	2-8d	2-5/16"	3/8"	2 1/4"	3 1/2"
	14 TJI 35X	Yes	4-8d	Yes	6-8d	810	3-8d	2-5/16"	3/8"	2 1/4"	3 1/2"
	16 TJI 35X	Yes	5-8d	Yes	7-8d	915	3-8d	2-5/16"	3/8"	2 1/4"	3 1/2"
	18 TJI 35X	Yes	6-8d	Yes	8-8d	1015	3-8d	2-5/16"	3/8"	2 1/4"	5 1/2"
	20 TJI 35X	Yes	6-8d	Yes	9-8d	1115	4-8d	2-5/16"	3/8"	2 3/4"	5 1/2"
	22 TJI 35X	Yes	7-8d	Yes	11-8d	1220	4-8d	2-5/16"	3/8"	3"	5 1/2"
	24 TJI 35X	Yes	8-8d	Yes	12-8d	1320	4-8d	2-5/16"	3/8"	3"	5 1/2"
	26 TJI 35X	Yes	8-8d	Yes	12-8d	1385	5-8d	3 1/2"	3/4"	3 1/2"	7"
	28 TJI 35X	Yes	8-8d	Yes	12-8d	1450	5-8d	3 1/2"	3/4"	3 1/2"	7"
30 TJI 35X	Yes	8-8d	Yes	12-8d	1450	6-8d	3 1/2"	3/4"	3 1/2"	7"	
Plywood Web	10 TJI 55E 55	Yes	3-10d	Yes	3-10d	610	2-10d	3 1/2"	1 1/2"	2"	3 1/2"
	12 TJI 55E 55	Yes	3-10d	Yes	4-10d	710	2-10d	3 1/2"	1 1/2"	2"	3 1/2"
	14 TJI 55E 55	Yes	4-10d	Yes	6-10d	810	2-10d	3 1/2"	1 1/2"	2"	3 1/2"
	16 TJI 55E 55	Yes	5-10d	Yes	7-10d	985	2-10d	3 1/2"	1 1/2"	2"	3 1/2"
	18 TJI 55E 55	Yes	6-10d	Yes	8-10d	1080	2-10d	3 1/2"	1 1/2"	2 1/4"	3 1/2"
	20 TJI 55E 55	Yes	6-10d	Yes	9-10d	1180	2-10d	3 1/2"	1 1/2"	2 1/4"	5 1/2"
	22 TJI 55E 55	Yes	7-10d	Yes	11-10d	1280	2-10d	3 1/2"	1 1/2"	2 1/4"	5 1/2"
	24 TJI 55E 55	Yes	8-10d	Yes	12-10d	1375	2-10d	3 1/2"	1 1/2"	3"	5 1/2"
Plywood Web	26 TJI 55E 55	Yes	5-10d	Yes	11-10d	1475	2-10d	3 1/2"	1 1/2"	3 1/2"	7"
	28 TJI 55E 55	Yes	6-10d	Yes	11-10d	1515	2-10d	3 1/2"	1 1/2"	3 1/2"	7"
	30 TJI 55E 55	Yes	6-10d	Yes	12-10d	1560	2-10d	3 1/2"	1 1/2"	3 1/2"	7"

(1) Dimensions shown are for maximum load. Specific application may permit reduction in this criteria. (2) The minimum bearing length may be reduced for joists supported by hangers if supplemental nail attachment to the end web stiffener is provided.

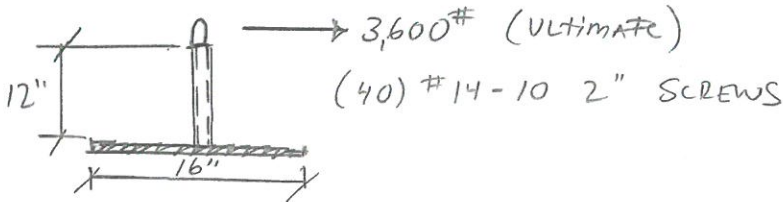
*Web stiffener should be 3/4" MICRO=LAM lumber or equivalent stiffers.

Legacy Literature
See Note on Front Cover

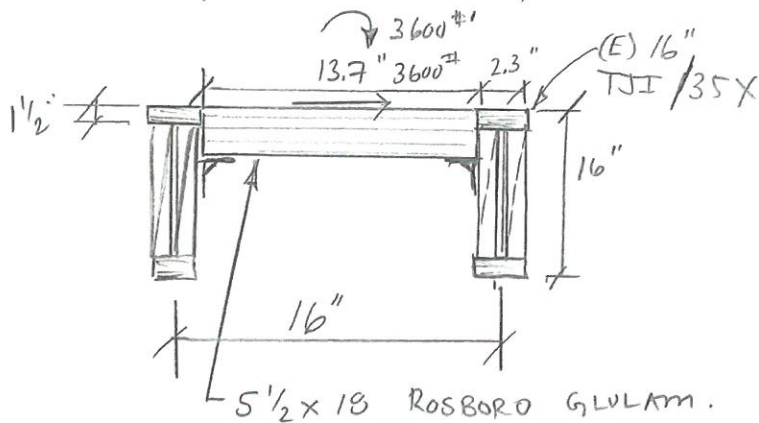
GUARDIAN FALL PROTECTION ANCHORAGE

(STANDARD # 00645)

ASSUME ARREST FORCE EQUAL TO 1800#
 DESIGN ANCHORAGE FOR A FACTOR OF SAFETY
 EQUAL TO 2.0. → 3600# ←
 OSHA 29 CFR 1926.502(d)(15) LL



$M = 3600#(1') = 3600# = 43,200#''$



CONSERVATIVE

$f_b = \frac{3600#(12)}{(18)(5.5)^2/6} = 476 \text{ psi}$

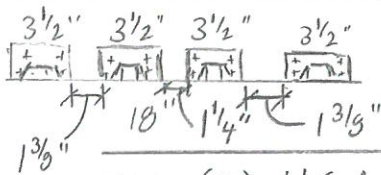
$f_b = 476 \text{ psi} < 1450 \text{ psi O.K.}$

$V = \frac{3600#(12)}{13.7} = 3153#$

$f_v = \frac{(1.5)(3153#)}{(5.5)(18)} = 49 \text{ psi} < 230 \text{ psi}$

USE 5 1/2 x 18 ROSBORO X-BEAM BLOCKING BELOW
 FALL PROTECTION BASE O.K.

ANCHORAGE GLULAM BEAM TO BLOCKING.




$T=C = 3153# > (4)(780#) = 3120#$
 Ultimate

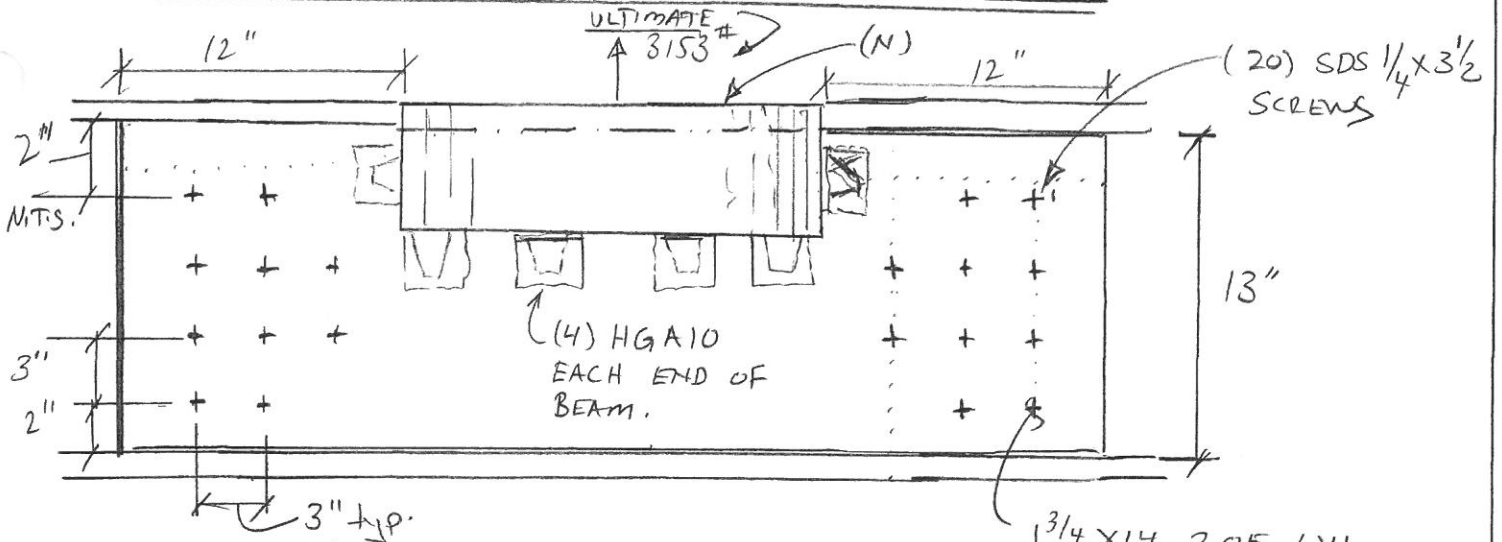
1% over
 WITH ULTIMATE
 FORCES O.K.

USE (4) HGA10 EACH SIDE
 WITH SDS 1/4 x 3 1/2" SCREWS typ.

(6) HGA10 USED

 MILLER CONSULTING ENGINEERS	9570 SW Barbur Blvd Suite One Hundred Portland, OR 97219-5412	Project Name <u>North Plains E.S.</u> Project # <u>171530</u>
	(503) 246-1250 Fax: 246-1395	Location <u>32030 NW North Avenue, North Plains, Oregon</u>
		Client <u>Tremco Inc. Roofing and Building Maintenance</u>
		By <u>LPJ</u> Ck'd <u>Rmm</u> Date <u>3/1/2018</u> Page <u>11 of 12</u>

CONNECTION OF BLOCKING TO WEB OF TJI



$N_{REQ'D} = \frac{3153 \#}{15.18} < 20$

$\left[\frac{157 \# (1.6)}{C_D} \left(\frac{2.5'}{C_d} \right) \right]$

USE (20) SDS 1/4 x 3 1/2 WOOD SCREWS
BLOCKING TO WEB OF EXISTING
TJI

3/4 x 14 2.0E LVL
MICROLLAM BLOCKING
RIPPED TO FIT,
BETWEEN EXISTING
FLANGES TYP.
(42" LONG)

$M = \frac{3153 \# (2.5')}{4} = 1970 \#'$ (ULTIMATE) $< 6103 \#'$ (1.6) = 9765 \#' (WORKING)

$V = 3153 \# < 3952 \#$
↑ INCLUDES $C_D = 1.6$

↑ ONE PLY
LOOKED AT ONLY

1 x 13 2.0E LVL MICROLLAM
BLOCKING RIPPED FROM 3/4 x 14
IS ACCEPTABLE



MILLER
CONSULTING
ENGINEERS

9570 SW Barbur Blvd
Suite One Hundred
Portland, OR 97219-5412

(503) 246-1250
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