ENGINEERS' SUBMITTAL REVIEW STAMP & COMMENTS

Project: MMC Bean AHU Replacement Project	
Submittal Name # 12 - Bean A.H.U. Replacement Project - Mechanical Seismic Controls (4-30-2015)	
AKF Project No: B140263-000	**AKF Log No.** H-14

AKF Group, LLC Submittal Stamp

__X__ No Exceptions Taken
_____ Make Corrections Noted - No Resubmission Required
_____ Revise and Resubmit
_____ Rejected
_____ Returned Without Action

Checking is only for general conformance with the design concept of the project and general compliance with the information given in the contractor documents. Any action shown is subject to the given requirements of the plans and specifications. Contractor is responsible for: Dimensions which shall be confirmed and correlated at the job site; fabrication processes and techniques of construction; coordination of his work with that of all other trades; and the satisfactory performance of his work.

Date: 6/19/15

By: DAC

General Comments: Review of submitted shop drawings is limited to system material and function compliance to issued plans, specifications, addendums and bulletins. Specific quantities of necessary material items to provide a complete and functioning system are not being confirmed as part of this review. Ultimate responsibility for quantities of necessary materials to provide a complete and functioning system shall be by the submitting contractor and equipment vendor.

Review Comments:

Project: 1508 - Maine Medical Center AHU Replacement
Portland, Maine

Submittal #114.0 23 05 48 - Mechanical Vibration Isolation and Seismic Controls

P/D: Mechanical Seismic Controls

APPROVERS:	Brandon Romano **(Maine Medical Center)** David Roberts **(AKF)**	**CREATED BY:**	Nick Munro**(Consigli Construction Co., Inc.)**
RESPONSIBLE CONTRACTOR:	Johnson & Jordan, Inc Dana Foote **(Johnson & Jordan, Inc)**	**STATUS:**	Open
TYPE:		**SPEC SECTION:**	23 05 48 - Mechanical Vibration Isolation and Seismic Controls
COPIES TO:			
DESCRIPTION:			
ATTACHMENTS:	# 12 - Bean A.H.U. Replacement Project - Mechanical Seismic Controls (4-30-2015).pdf		

ARCHITECT'S STAMP

CONTRACTOR'S STAMP

Consigli Construction Co., Inc.

☐ Approved for A/E Review ☐ Revise & Resubmit
☐ Approved as Noted for A/E Review ☐ Rejected

Spec. Section: 23 05 48	Submittal No.: 114
Date: 6/4/2015	By: Nick Munro

If so marked, approval is given for design only. It does not relieve the subcontractor from complying with the requirements of the contract, contract drawings and specifications. The subcontractor shall be responsible for all dimensions, quantities, schedules and field conditions.

SUBMITTAL WORKFLOW

#	NAME	SUBMITTER/ APPROVER	SENT DATE	DUE DATE	RETURNED DATE	RESPONSE	ATTACHMENTS	COMMENTS
1	Nick Munro	Submitter		6/4/2015	6/4/2015	Submitted		
2	David Roberts	Approver	6/4/2015	6/18/2015		Pending		
3	Brandon Romano	Approver		6/18/2015		Pending		

BY **DATE** **COPIES TO**

15 Franklin Street
Portland, Maine 04101

Johnson and Jordan Mechanical

SUBMITTAL - # 12

PROJECT:	**MMC – Bean Air Handler Replacement Project** 22 Bramhall Street Portland, Maine 04102 **JOB # 15035**
Construction Managers:	Maine Medical Center Facilities Development P.M. – Brandon Romano 22 Bramhall Street Portland, Maine 04102
SUBMITTED BY:	JOHNSON & JORDAN, INC 18 MUSSEY RD. SCARBOROUGH, ME (207) 775-1169
SUBCONTRACTOR:	JOHNSON & JORDAN, INC 18 MUSSEY RD. SCARBOROUGH, ME (207) 775-1169
SUPPLIER:	Mechanical Control Systems 26-B Keeywadin Drive Salem, NH 03079 978-640-9994
SPECIFICATION SECTION:	230548
PARAGRAPH:	N/A
ITEM:	**Mechanical Seismic Controls**

JOHNSON & JORDAN

MECHANICAL CONTRACTORS

APPROVED_____ APPROVED AS NOTED_____
REVIEWED _____RE-SUBMIT_____
SUBJECT TO ARCHITECTS APPROVAL _____
DATE **4/30/15**_____ By: ***Jamie Evans***_____

REV.	DESCRIPTION	SOURCE of CHANGE	DATE
--	Initial Release		4/28/2015

SEISMIC CALCULATIONS

AHU Replacement

MECHANICAL CONTROL SYSTEMS
26-B Keeywaydin Drive
Salem, NH 03079

JOB: MMC Bean - AHU Replacement

CUSTOMER: Johnson and Jordan

JOB NUMBER: J5110

26-B Keewaydin Drive
Salem, NH 03079
P 978.640.9994

PROJECT		DWG NUMBER	REV. NO.	SHEET NO.
MMC Bean - AHU Replacement		J5110	--	2 OF 20
ORIGINATOR	DATE	CHECKED	DATE	
TPL	4/28/2015			

TABLE I - SCHEDULE

MMC Bean - AHU Replacement

TAG	QTY.	MFG.	MODEL	WT. (lbs.)	COMMENT
AHU-065	1	Trane	Custom	22,500	
AHU-066	1	Trane	Custom	17,400	
AHU-067	1	Trane	Custom	30,400	
AHU-069	1	Trane	Custom	17,000	
See TABLE II for Seismic Restraints					

TABLE II - SEISMIC SUMMARY

MMC Bean - AHU Replacement

	ANCHOR BOLTS per TAG				
	CONCRETE		STEEL	RESTRAINT	MINIMUM EDGE
TAG	Dia. (in.)	Embedment (in.)	Dia. (in.)		DISTANCE
AHU-065	1/2" (28)	4"	1/2" (28)	N/A	5"
AHU-066	1/2" (24)	4"	1/2" (24)	N/A	5"
AHU-067	1/2" (28)	4"	1/2" (28)	N/A	5"
AHU-069	1/2" (24)	4"	1/2" (24)	N/A	5"

26-B Keewaydin Drive
Salem, NH 03079
P 978.640.9994

PROJECT		DWG NUMBER	REV. NO.	SHEET NO.
MMC Bean - AHU Replacement		J5110	--	3 OF 20
ORIGINATOR	DATE	CHECKED	DATE	
TPL	4/28/2015			

Table of Contents:

I. Summary of Critical Assumptions and Directive Statements 4

II. Purpose 5

III. Scope 5

IV. Strategy & Assumptions 5

V. Exemptions 5

VI. Allowable Loads 6

VII. Seismic Forces 6

VIII. ANALYSES

AHU 8

26-B Keewaydin Drive
Salem, NH 03079
P 978.640.9994

PROJECT		DWG NUMBER	REV. NO.	SHEET NO.
MMC Bean - AHU Replacement		J5110	--	4 OF 20
ORIGINATOR	DATE	CHECKED	DATE	
TPL	4/28/2015			

I. Summary of Critical Assumptions and Directive Statements:

1. This analysis does not certify that the equipment is capable of handling the applied seismic loads. Any non-Mechanical Control Systems mounting supports, brackets or other means of attachment must be independently certified. Mechanical Control Systems assumes no responsibility for support structure - for its ability to withstand static or seismic loads, nor for its ability to distribute loads onto restraints.

2. Weight and dimensional data was provided by the customer. The values used in this analysis must be verified. If they vary, disregard these recommendations and notify Mechanical Control Systems of the changes.

3. These calculations will certify seismic restraints for seismic loads identified in Paragraph VI.

4. Housekeeping pads are by others. Per ICC Report ESR-1917, the minimum concrete thickness for Hilti Kwik Bolt TZ is 3-inches or 1.5 x anchor embedment – whichever is greater.

5. Bolt sizes and quantities are the minimum required to withstand the specified seismic forces as applied through the equipment center of gravity. This makes the standard seismic design assumption that all components and modules are connected to respond as a unitary lump mass. Any additional bolting required by the equipment manufacturer must also be installed.

26-B Keewaydin Drive
Salem, NH 03079
P 978.640.9994

PROJECT		DWG NUMBER	REV. NO.	SHEET NO.
MMC Bean - AHU Replacement		J5110	--	5 OF 20
ORIGINATOR	DATE	CHECKED	DATE	
TPL	4/28/2015			

II. PURPOSE:

These calculations are submitted to Johnson and Jordan for MMC Bean - AHU Replacement, to certify that the seismic restraints provided or recommended by Mechanical Control Systems will safely accept loads resulting from seismic forces.

III. SCOPE:

These calculations are for the seismic restraints supplied or specified by Mechanical Control Systems for use on the equipment per the Table II. These calculations certify that the Mechanical Control Systems components and specified hardware, when properly installed, are capable of safely supporting the specified seismic loads. These calculations do not cover equipment supplied by vendors nor the superstructure or substructure to which the Mechanical Control Systems components or specified hardware are attached. If there are any specs that supersede these assumptions, this analysis is invalid.

IV. STRATEGY AND ASSUMPTIONS:

For the purposes of this analysis, we must assume that the building and its internal structure have been designed to perform safely in response to an earthquake and remain intact and functioning after such an event. The equipment must be restrained and not break away from its supports during an earthquake. Therefore, the sum of the forces and moments acting on the equipment must be equal to zero. The problem can be reduced to a static analysis.

The force generated by the earthquake is composed of a vertical component and a horizontal component which act simultaneously about the equipment's center of gravity. The vertical component is taken to be .2 x S_{ds} multiplied by the equipment weight and added to the weight of the equipment. The compass orientation of the horizontal component is not known, therefore, assume an orientation that produces a worst case loading for a particular system. This information is based upon local and national codes.

V. EXEMPTIONS

PIPE

A. Pipe that passes through a wall or floor penetration. Provide positive attachment. No additional restraint required.

B. Top of pipe is within 12" of the support attachment to the structure. No additional restraint required.

C. Pipe is anchored and/or guided. No additional restraint required.

26-B Keewaydin Drive
Salem, NH 03079
P 978.640.9994

PROJECT		DWG NUMBER	REV. NO.	SHEET NO.
MMC Bean - AHU Replacement		J5110	--	6 OF 20
ORIGINATOR	DATE	CHECKED	DATE	
TPL	4/28/2015			

VI. ALLOWABLE LOADS:

Unless otherwise specified, allowable bolt loads are per the Manual of Steel Construction - AISC 360-10. Concrete is assumed to be fc' = 3,000 psi (minimum) – normal weight. ACI 318

For Hilti TZ Anchors, ratings are based on ICC Report ESR-1917.

VII. SEISMIC FORCES:

IBC / ASCE-7

Portland, ME

MCE Ground Motion
Zip Code - 04102
(sec),(%g)
0.2 ,**032.2** ,MCE Value of Ss
1.0 ,007.8,MCE Value of S1
Spectral Parameters for , Site Class D
Fa = **1.55**
Fv = 2.40

$S_S := .322$ $F_A := 1.55$

$S_{DS} := \frac{2}{3} \cdot F_A \cdot S_S$ $S_{DS} = 0.333$ g

$I_p := 1.5$ Component Importance Factor -
1.5 for life safety components, component containing certain quantities of hazardous or flammable materials, certain storage racks
1.0 for all other components

$a_p := 1$ Component amplification factor -Table 13.6-1

$R_p := 2.5$ Component Response Modification Factor - Table 13.6-1

$z := 1$ Height in structure at point of attachment

$h := 1$ Average roof height relative to base

k is not required to be taken as greater than $k := 1.6 \cdot S_{DS} \cdot I_p$ $k = 0.80$

k shall not be taken as less than $k := .3 \cdot S_{DS} \cdot I_p$ $k = 0.15$

26-B Keewaydin Drive
Salem, NH 03079
P 978.640.9994

PROJECT		DWG NUMBER	REV. NO.	SHEET NO.
MMC Bean - AHU Replacement		J5110	--	7 OF 20
ORIGINATOR	DATE	CHECKED	DATE	
TPL	4/28/2015			

Spring isolated components and systems, and internally isolated components and systems - above grade

$$a_p := 2.5 \qquad R_p := 2.0 \qquad z := 1$$

$$k := \frac{.4 \cdot a_p \cdot S_{DS}}{\frac{R_p}{I_p}} \cdot \left(1 + 2 \cdot \frac{z}{h}\right) \qquad k = 0.75 \qquad F_p := 0.75 \cdot W_p$$

26-B Keewaydin Drive
Salem, NH 03079
P 978.640.9994

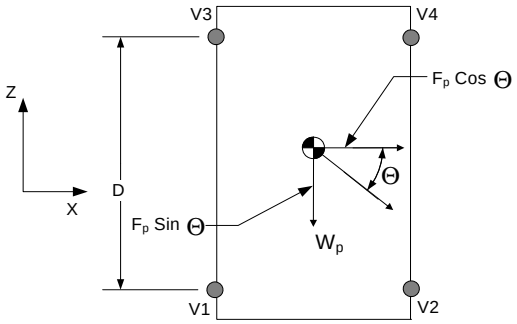
PROJECT		DWG NUMBER	REV. NO.	SHEET NO.
MMC Bean - AHU Replacement		J5110	--	8 OF 20
ORIGINATOR	DATE	CHECKED	DATE	
TPL	4/28/2015			

EQUIPMENT TAG NO. AHU-065,066,067,069

Evaluate one section with a weight of 5,800 lbs. as worst case and restrain all of the sections the same way.

Weight of payload,

$W_p := 5800$ lbs.



shorter span between anchors

$A := 70$, inches

longer span between anchors

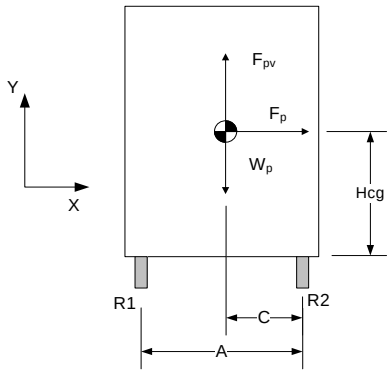
$D := 145$, inches

$c := \frac{A}{2}$ $c = 35$, inches

height of system c.g. $H_{cg} := 47$, in.

c.g. offset $Zcg_{off} := 5$, in.

$Xcg_{off} := 2$, in.



$S_{DS} := .333$, g

Horizontal seismic input $F_p := .75 \cdot W_p$ $F_p = 4350$, lbs.

Vertical seismic input $F_{pv} := .2 \cdot S_{DS} \cdot W_p$ $F_{pv} = 386$, lbs.

ASSUMPTIONS:

Equipment to be restrained has sufficient strength and stiffness to withstand the imposed forces and to transmit the forces to the restraints.

FIND:

The shear force - V_{max}

The tension force - T_{max}

The compression force - C_{max}

26-B Keewaydin Drive
Salem, NH 03079
P 978.640.9994

PROJECT		DWG NUMBER	REV. NO.	SHEET NO.
MMC Bean - AHU Replacement		J5110	--	9 OF 20
ORIGINATOR	DATE	CHECKED	DATE	
TPL	4/28/2015			

ANALYSIS:

The horizontal component can occur in any axis. The maximum forces occur at an angle which is a function of the anchor spacing. The maximum forces occur for the following angle:

$$\Theta_{max} := \operatorname{atan}\left(\frac{A}{D}\right)\cdot\left(\frac{360}{2\cdot\pi}\right) \qquad \Theta_{max} = 25.77 \text{ ,degrees}$$

$$\Theta_{max} := \Theta_{max}\cdot\frac{2\cdot\pi}{360} \qquad \Theta_{max} = 0.45 \text{ , radians}$$

Summing the Moments

$$M_{XT} := \left(F_p\cdot\sin\left(\Theta_{max}\right)\cdot H_{cg}\right) + \left(F_{pv}\cdot Zcg_{off}\right) \qquad M_{XT} = 90816$$

$$M_{ZT} := \left(F_p\cdot\cos\left(\Theta_{max}\right)\cdot H_{cg}\right) + \left(F_{pv}\cdot Xcg_{off}\right) \qquad M_{ZT} = 184890$$

$$M_{XC} := \left(F_p\cdot\sin\left(\Theta_{max}\right)\cdot H_{cg}\right) + \left(W_p + F_{pv}\right)\cdot Zcg_{off} \qquad M_{XC} = 119816$$

$$M_{ZC} := \left(F_p\cdot\cos\left(\Theta_{max}\right)\cdot H_{cg}\right) + \left(W_p + F_{pv}\right)\cdot Xcg_{off} \qquad M_{ZC} = 196490$$

Maximum tension (T_{max}) is obtained from,

$$T_{max} := \left(\frac{F_{pv} - W_p}{4}\right) + \left(\frac{M_{XT}}{2\cdot D}\right) + \left(\frac{M_{ZT}}{2\cdot A}\right)$$

$T_{max} = 280$, lbs.

Maximum compression (C_{max}) is obtained from,

$$C_{max} := \left(\frac{-W_p + F_{pv}}{4}\right) - \left(\frac{M_{XC}}{2\cdot D}\right) - \left(\frac{M_{ZC}}{2\cdot A}\right)$$

$C_{max} = -3170$, lbs.

Calculate the shear force (V_{max}) on each anchor

$$V_{max} := \frac{F_p}{4} \qquad V_{max} = 1088 \text{ , lbs.}$$

26-B Keewaydin Drive
Salem, NH 03079
P 978.640.9994

PROJECT		DWG NUMBER	REV. NO.	SHEET NO.
MMC Bean - AHU Replacement		J5110	--	10 OF 20
ORIGINATOR	DATE	CHECKED	DATE	
TPL	4/28/2015			

SUMMARY:

Each anchor must be capable of withstanding the following forces:

Compression : $C_{max} = -3170$, lbs.

Tension: $T_{max} = 280$, lbs.

Shear: $V_{max} = 1088$, lbs.

Evaluate Bolted Attachment to Steel

BOLT SUMMARY - The maximum force imposed on the single bolt attachment are:

Tension: $T_{max} = 280$, lbs.

$V_{max} = 1088$, lbs.

Combined shear and tension check for A325 Bolt per AISC

Root area of 1/2" dia bolt = .126 in ^{2} - AISC ASD 9th edition

$$f_{tb} := \frac{T_{max}}{.126} \qquad f_{tb} = 2225 \text{ ,psi}$$

$$f_{vb} := \frac{V_{max}}{.126} \qquad f_{vb} = 8631 \text{ ,psi}$$

Maximum allowable shear stress is 21,000 psi. OK

The maximum allowable tension stress is:

$$f_{t2} := \sqrt{44^2 - 4.39 \cdot \left(\frac{f_{vb}}{1000}\right)^2} \qquad f_{t2} = 40.1 \text{ ksi}$$

f_{tb} is less than $f_{t2,}$ so the bolt is OK. Use 4 Bolts - 1/2-inch diameter - per ASTM A325

For concrete attachment see Hilti Profis report

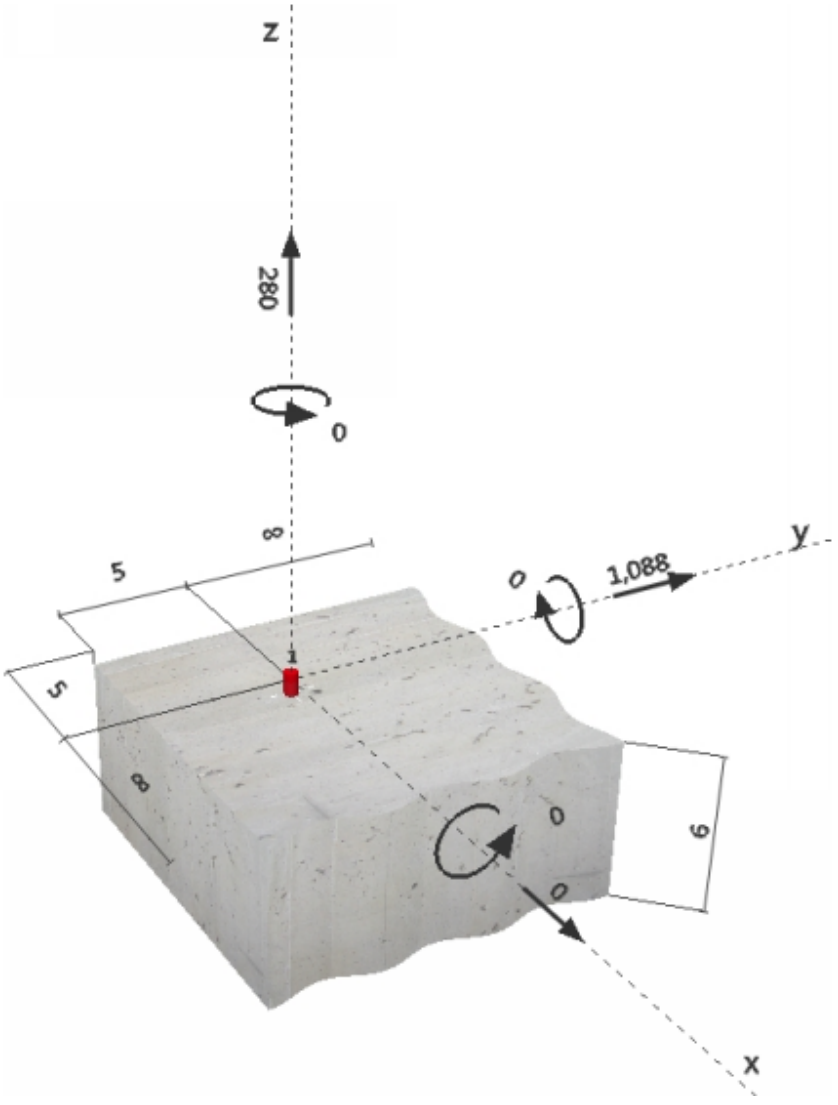
26-B Keewaydin Drive
Salem, NH 03079
P 978.640.9994

PROJECT		DWG NUMBER	REV. NO.	SHEET NO.
MMC Bean - AHU Replacement		J5110	--	11 OF 20
ORIGINATOR	DATE	CHECKED	DATE	
TPL	4/28/2015			

1 Input data

Anchor type and diameter:	**Kwik Bolt TZ - CS 1/2 (3 1/4)**
Effective embedment depth:	h_{ef} = 3.250 in., h_{nom} = 3.625 in.
Material:	Carbon Steel
Evaluation Service Report:	ESR-1917
Issued I Valid:	5/1/2013 | 5/1/2015
Proof:	Design method ACI 318 / AC193
Stand-off installation:	- (Recommended plate thickness: not calculated)
Profile:	no profile
Base material:	cracked concrete, 3000, f_c' = 3000 psi; h = 6.000 in.
Reinforcement:	tension: condition B, shear: condition B; no supplemental splitting reinforcement present edge reinforcement: none or < No. 4 bar
Seismic loads (cat. C, D, E, or F)	yes (D.3.3.6)

Geometry [in.] & Loading [lb, in.lb]



26-B Keewaydin Drive
Salem, NH 03079
P 978.640.9994

PROJECT		DWG NUMBER	REV. NO.	SHEET NO.
MMC Bean - AHU Replacement		J5110	--	12 OF 20
ORIGINATOR	DATE	CHECKED	DATE	
TPL	4/28/2015			

2 Proof I Utilization (Governing Cases)

		Design values [lb]		Utilization	
Loading	**Proof**	**Load**	**Capacity**	**β_N / β_V [%]**	**Status**
Tension	Pullout Strength	280	1050	27 / -	OK
Shear	Concrete edge failure in direction x-	1088	1380	- / 79	OK

Loading	β_N	β_V	ζ	Utilization $\beta_{N,V}$ [%]	Status
Combined tension and shear loads	0.267	0.789	5/3	79	OK

3 Warnings

- Please consider all details and hints/warnings given in the detailed report!

Fastening meets the design criteria!

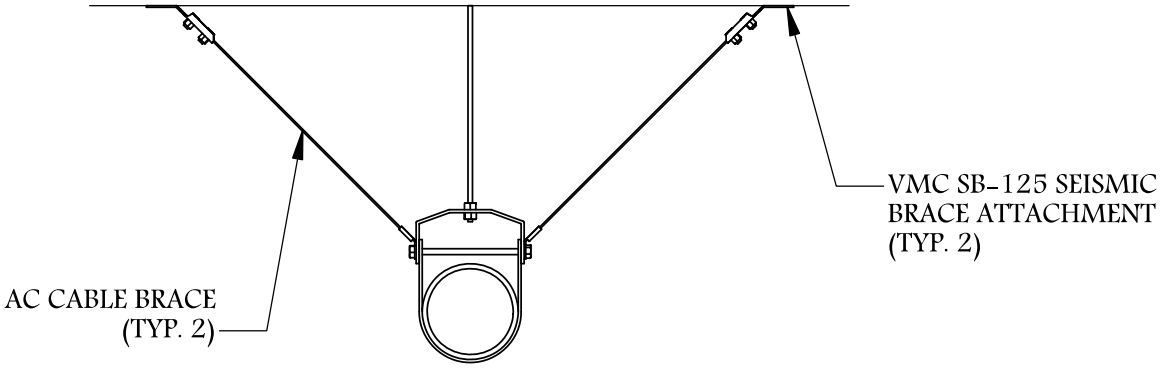
4 Remarks; Your Cooperation Duties

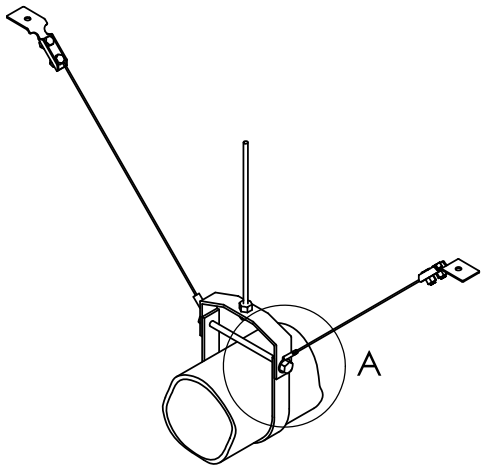
- Any and all information and data contained in the Software concern solely the use of Hilti products and are based on the principles, formulas and security regulations in accordance with Hilti's technical directions and operating, mounting and assembly instructions, etc., that must be strictly complied with by the user. All figures contained therein are average figures, and therefore use-specific tests are to be conducted prior to using the relevant Hilti product. The results of the calculations carried out by means of the Software are based essentially on the data you put in. Therefore, you bear the sole responsibility for the absence of errors, the completeness and the relevance of the data to be put in by you. Moreover, you bear sole responsibility for having the results of the calculation checked and cleared by an expert, particularly with regard to compliance with applicable norms and permits, prior to using them for your specific facility. The Software serves only as an aid to interpret norms and permits without any guarantee as to the absence of errors, the correctness and the relevance of the results or suitability for a specific application.
- You must take all necessary and reasonable steps to prevent or limit damage caused by the Software. In particular, you must arrange for the regular backup of programs and data and, if applicable, carry out the updates of the Software offered by Hilti on a regular basis. If you do not use the AutoUpdate function of the Software, you must ensure that you are using the current and thus up-to-date version of the Software in each case by carrying out manual updates via the Hilti Website. Hilti will not be liable for consequences, such as the recovery of lost or damaged data or programs, arising from a culpable breach of duty by you.

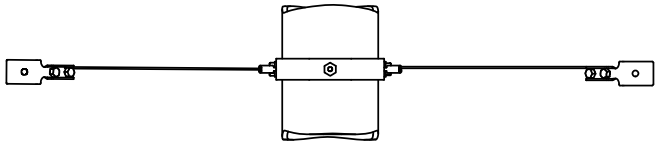
Use HILTI KWIK BOLT TZ
- 1/2- inch diameter
- 4- inch embedment
- 3,000 psi concrete
- 5- inch minimum edge distance
- 6- inch minimum concrete thickness
- cracked or uncracked concrete

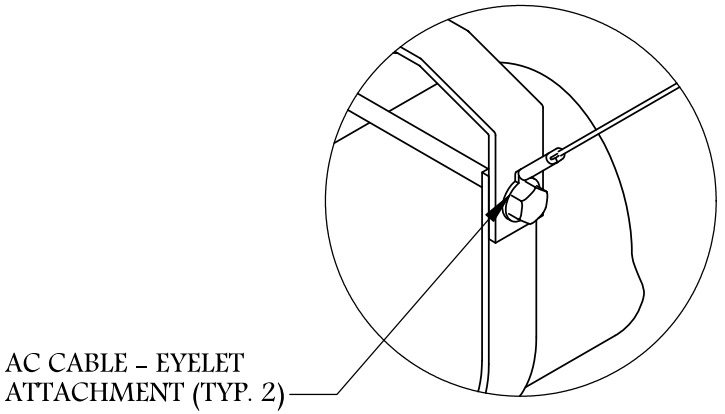
Install per Manufacturer's instructions and ESR-1917.

Detail 5









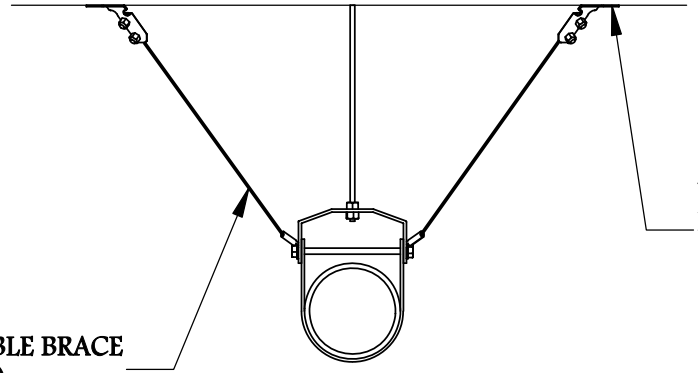
DETAIL A
SCALE 1 : 5

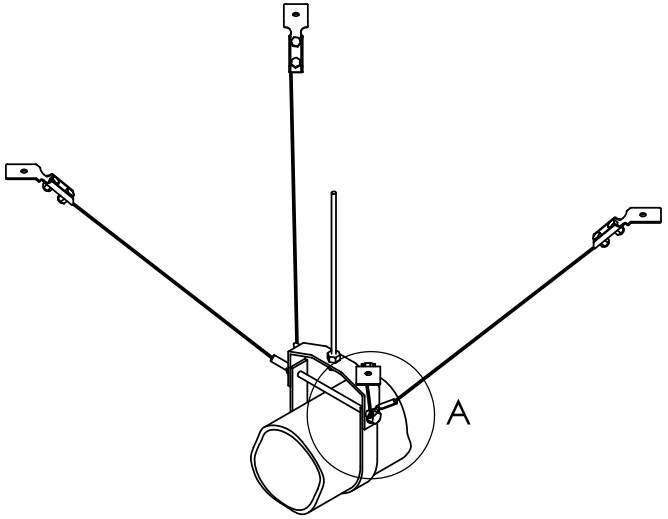
Mechanical Control Systems
1501 Main St. Unit 30
Tewksbury, MA 01876
P - 978.640.9994

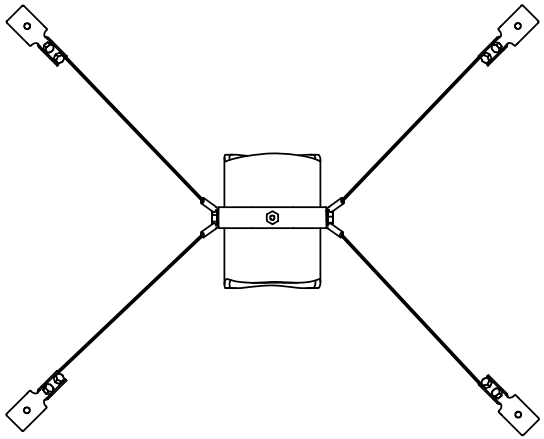
Transverse Cable Bracing
Clevis Hanger
VMC SB-125

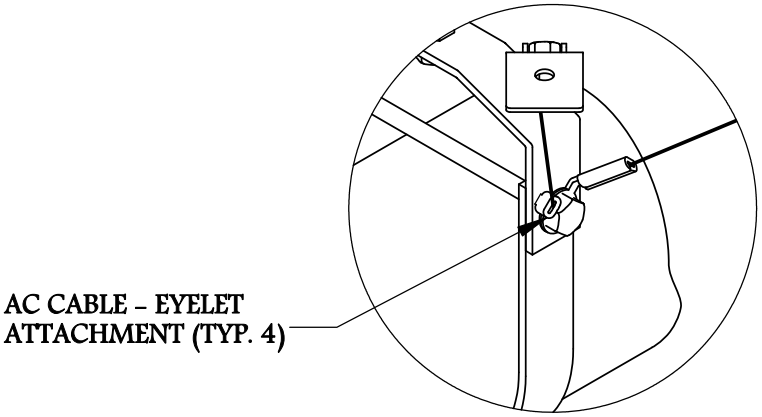
PROJECT:	MMC Bean
CUSTOMER:	Johnson & Jordan
JOB. NO.	J5110
REV	--

Detail 6









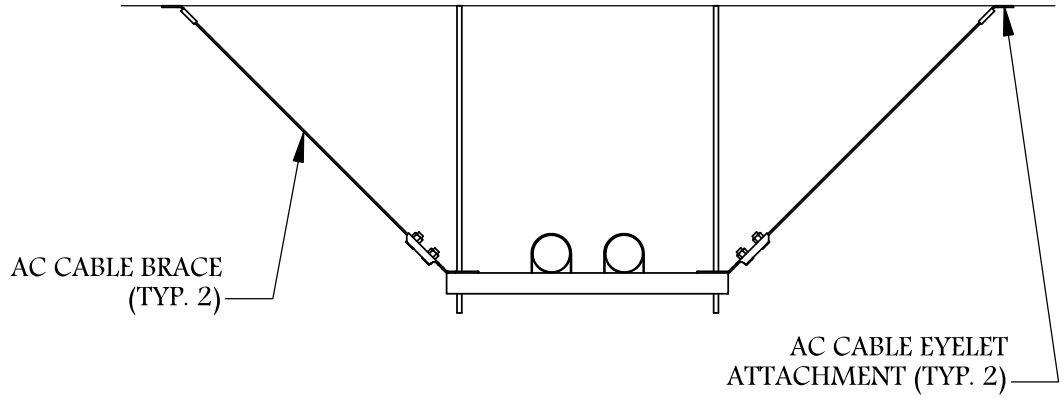
DETAIL A
SCALE 1 : 5

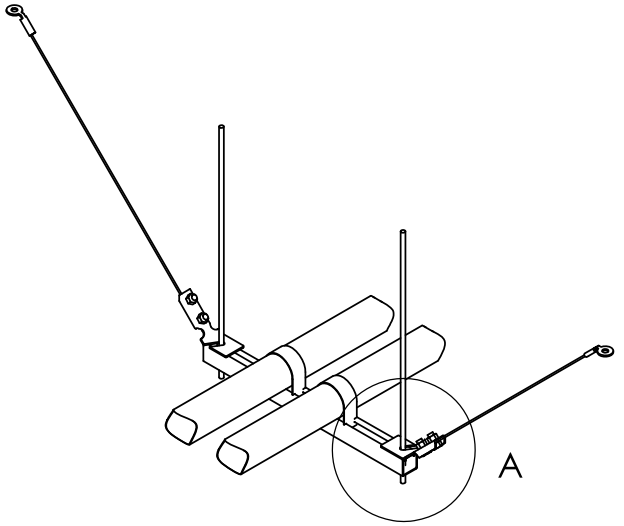
Mechanical Control Systems
1501 Main St. Unit 30
Tewksbury, MA 01876
P - 978.640.9994

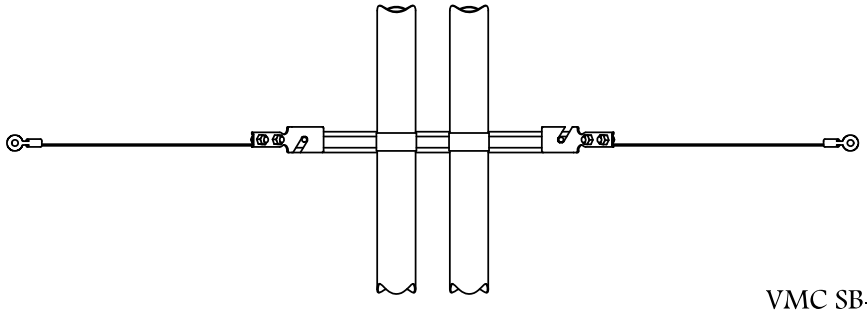
Transverse and Longitudinal bracing
Clevis Hanger
VMC SB-125

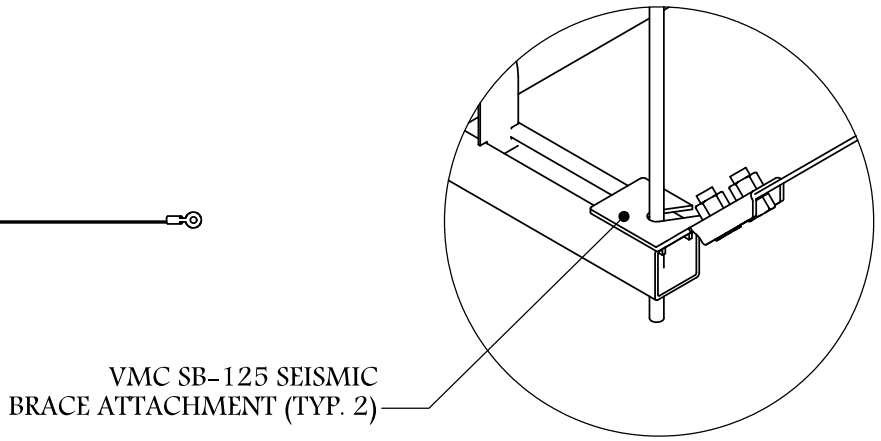
PROJECT:	MMC Bean
CUSTOMER:	Johnson & Jordan
JOB. NO.	J5110
REV	--

Detail 5









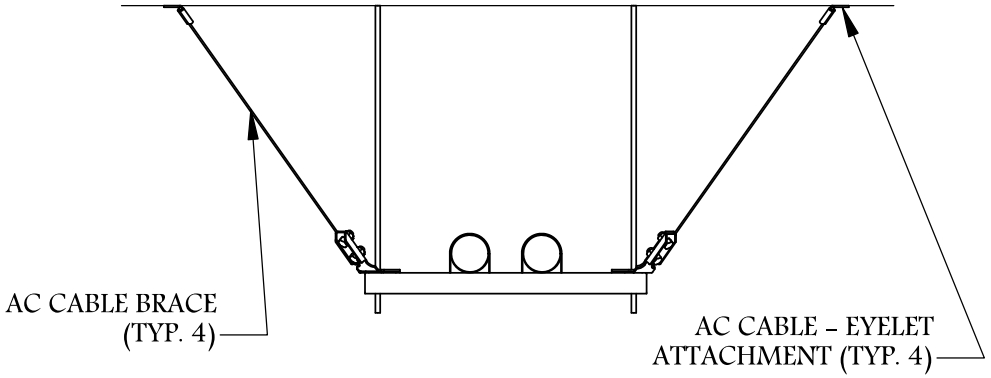
DETAIL A
SCALE 1 : 5

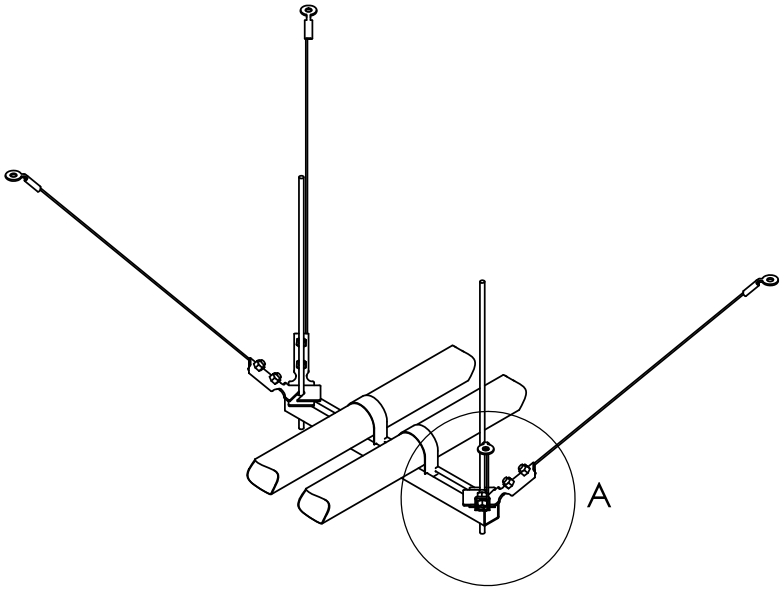
Mechanical Control Systems
1501 Main St. Unit 30
Tewksbury, MA 01876
P - 978.640.9994

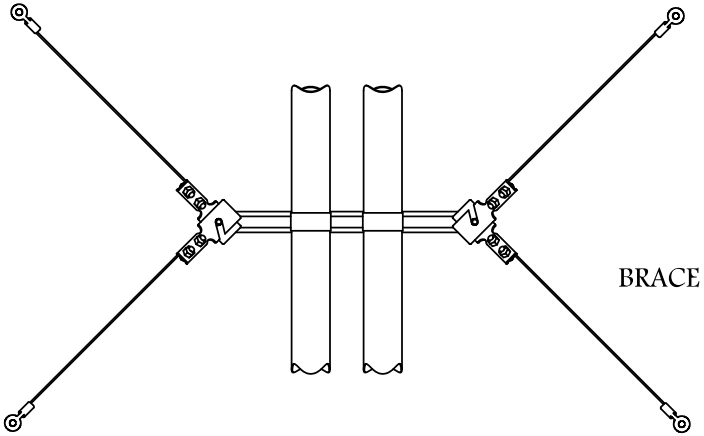
Transverse Cable Bracing
Trapeze Hanger
VMC SB-125

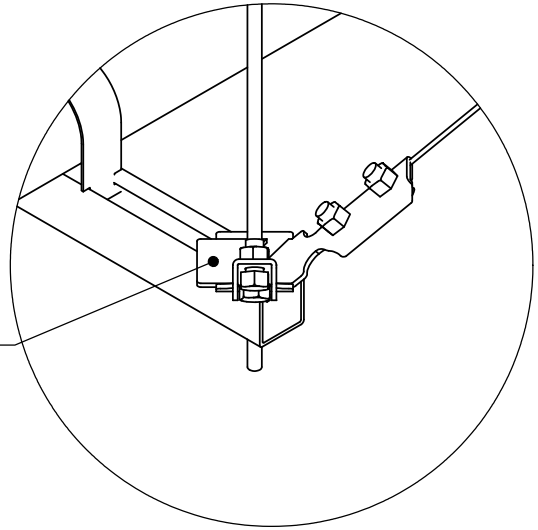
PROJECT:	MMC Bean
CUSTOMER:	Johnson & Jordan
JOB. NO.	J5110
REV	--

Detail 6









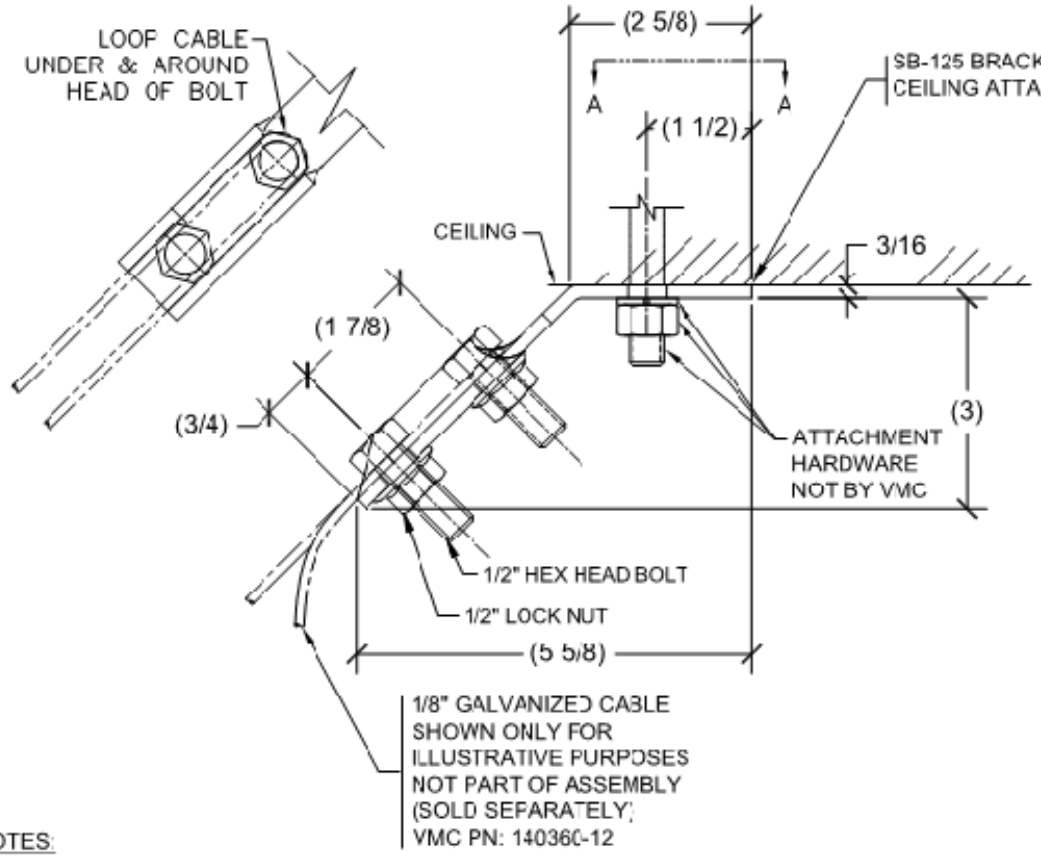
DETAIL A
SCALE 1 : 5

Mechanical Control Systems
1501 Main St. Unit 30
Tewksbury, MA 01876
P - 978.640.9994

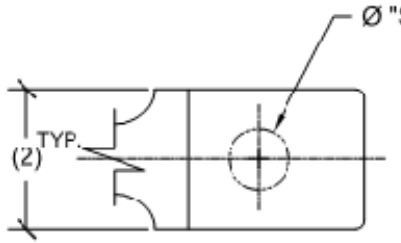
Transverse and Longitudinal Bracing
Trapeze Hanger
VMC SB-125

PROJECT:	MMC Bean
CUSTOMER:	Johnson & Jordan
JOB. NO.	J5110
REV	--

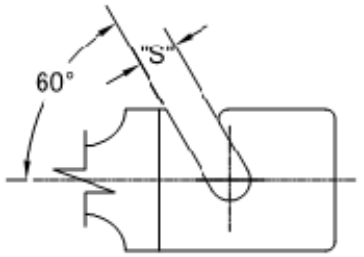
Detail 5 & 6



KIT PART NUMBER	"S"	COLOR CODE	MAX. TENSION ALLOWABLE
SB-125-01	9/16" KIT	CLEAR ZINC COATED	667 LBS.
SB-125-02	11/16" KIT	YELLOW ZINC COATED	667 LBS.



CEILING ATTACHMENT BRACKET



PIPING/EQUIPMENT ATTACHMENT BRACKET
(NOT TO BE USED AT CEILING ATTACHMENT)

ALTERNATE VIEW A–A

NOTES:

1) MATERIAL: COLD ROLLED STEEL
2) HARDWARE & BRACKETS ZINC ELECTROPLATE
3) FIELD TORQUE 1/2" LOCK NUTS TO 75 FT.- LBS.
4) 1 KIT CONSISTS OF EITHER 9/16 OR 11/16 ASSEMBLIES CONSISTING OF :
   2 SLOTTED BRACKETS
   2 HOLED BRACKETS
   8 BOLTS
   8 SERRATED FLANGE NUTS
5) CABLE SOLD SEPARATELY.

OTHER MATERIALS, COMPOUNDS, OR FINISHES WITH EQUAL OR SUPERIOR PROPERTIES MAY BE SUBSTITUTED AS THEY BECOME AVAILABLE.

Mechanical Control Systems
1501 Main St. Unit 30
Tewksbury, MA 01876
P - 978.640.9994

VMC SB-125

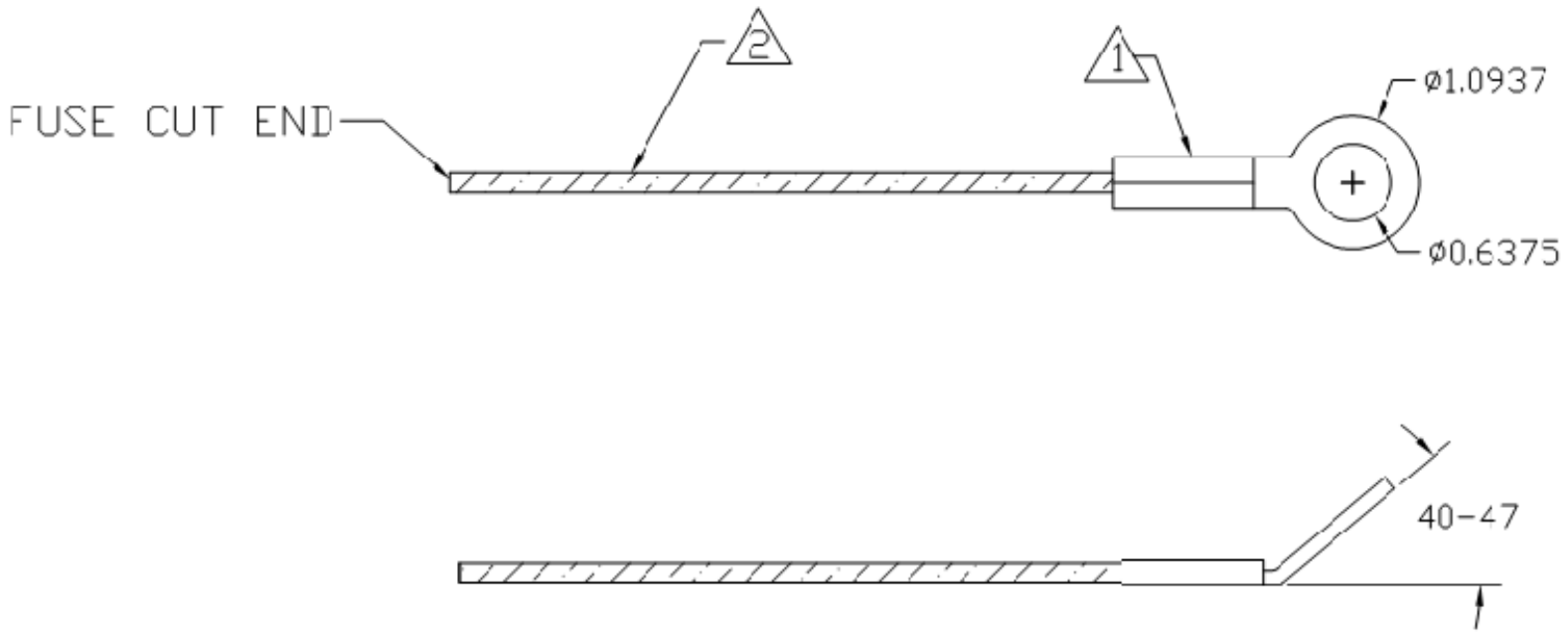
PROJECT: MMC Bean

CUSTOMER: Johnson & Jordan

JOB. NO. J5110

REV --

Detail 5 & 6



NOTES:

1. 560-P-510 EYELET ZINC PLATED CARBON STEEL
2. 1/8" 7X19 GALV. CABLE
3. EYELET RATED – 2,000 LBS. IN TENSION

Mechanical Control Systems
1501 Main St. Unit 30
Tewksbury, MA 01876
P - 978.640.9994

Cable Brace
MCS 4-11' - 1/8" Eyelet

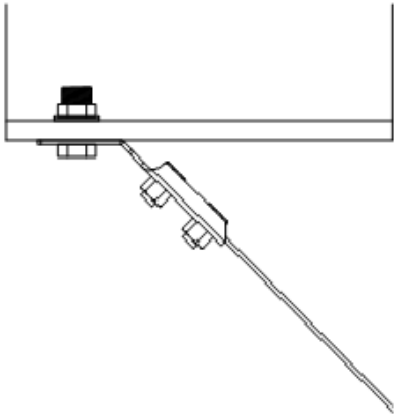
PROJECT: MMC Bean

CUSTOMER: Johnson & Jordan

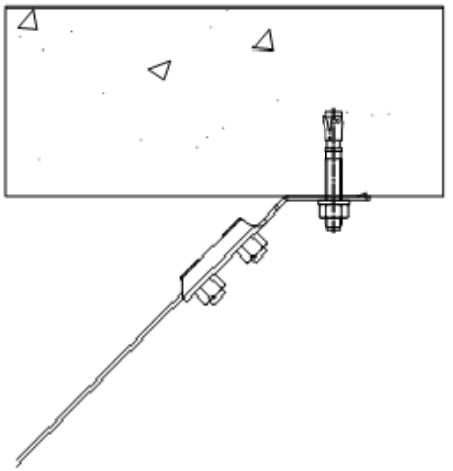
JOB. NO. J5110

REV --

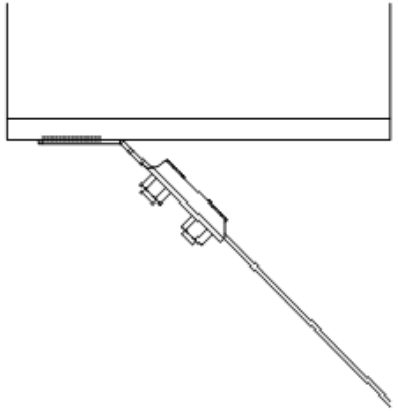
Detail 5 & 6



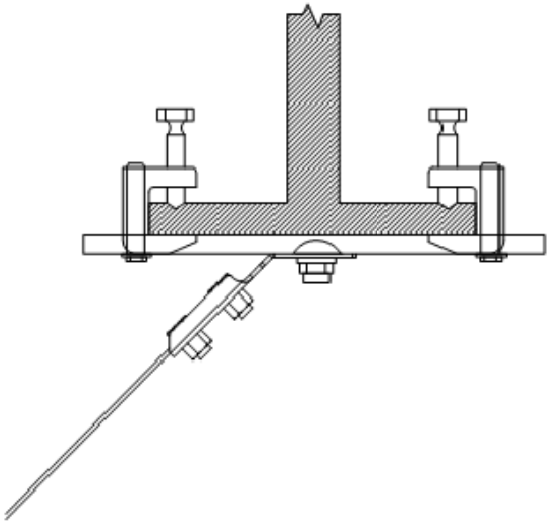
A325 BOLT TO STEEL



WEDGE ANCHOR TO CONCRETE



1/4" FILLET WELD TO STEEL



ATTACHMENT TO DOUBLE SIDED
BEAM CLAMP (CLAMP BY OTHERS)

Mechanical Control Systems
1501 Main St. Unit 30
Tewksbury, MA 01876
P - 978.640.9994

SEISMIC ATTACHMENT DETAIL

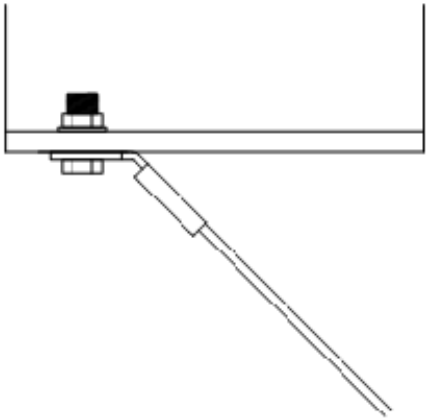
PROJECT: MMC Bean

CUSTOMER: Johnson & Jordan

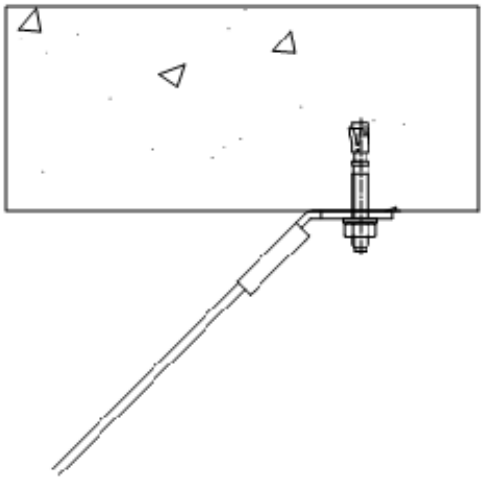
JOB. NO. J5110

REV --

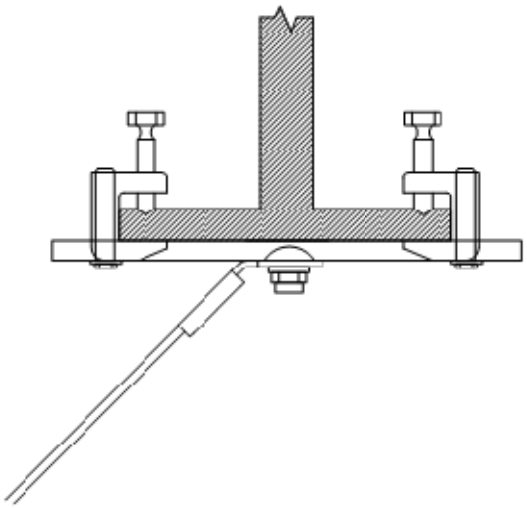
Detail 5 & 6



A325 BOLT TO STEEL



WEDGE ANCHOR TO CONCRETE



ATTACHMENT TO DOUBLE SIDED
BEAM CLAMP (CLAMP BY OTHERS)

Mechanical Control Systems
1501 Main St. Unit 30
Tewksbury, MA 01876
P - 978.640.9994

SEISMIC EYELET ATTACHMENT DETAIL

PROJECT: MMC Bean

CUSTOMER: Johnson & Jordan

JOB. NO. J5110

REV --