



QUAILE ENGINEERING LTD.

38 Parkside Drive
UNIT 7
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L3Y 8J9

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Toll Free: 1-877-364-5209
Email: quaile.eng@rogers.com

May 9, 2016

Mr. Maurizio Bertato
Liv Building Products Inc.
6050 Owen Rd
Uxbridge, Ontario
L9P 1R1

Re: Proof Testing of Invisirail Glass Panels

Dear Maurizio:

This is to confirm that proof loading has been carried out on the Invisirail glass guard system over the past number of years. The glass has been tested by loading a fully erected guard panel with posts spaced at 6' o/c. The loads that have been applied are as follows:

1. Proof loads of up to 538 lb have been applied horizontally to the top edge of the glass at mid-span without failure.
2. A proof load of 813 lb has been applied horizontally at the centre of the glass panel at mid-span without failure.

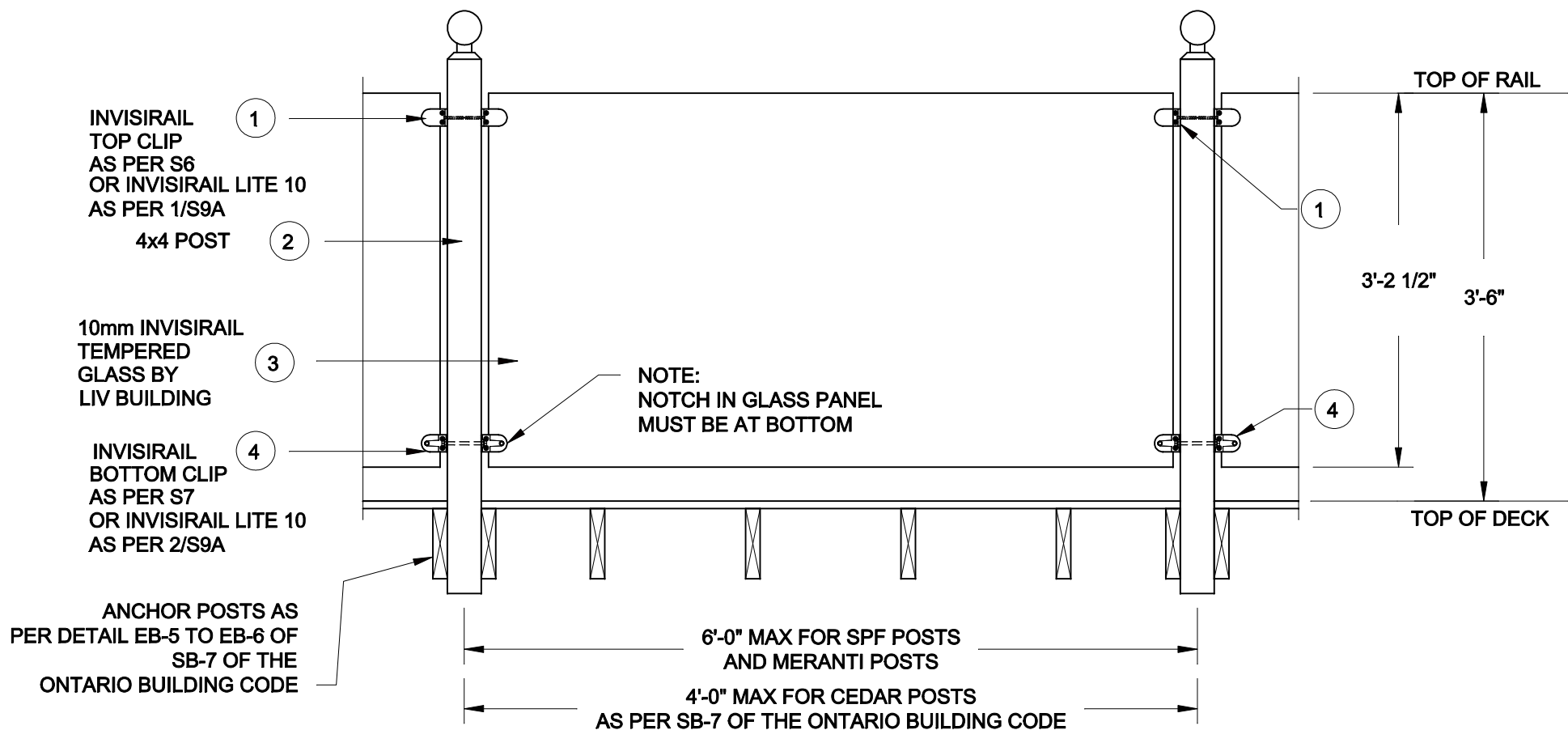
Additional tests have been carried out on the various connections and posts with a proof load of no less than 2 times the design live load as indicated on the sealed drawings.

I trust this is the information you require.

Yours truly,



Stephen Boyd, P.Eng.



1 42" GUARD w/
S2 4x4 POSTS

FOR PRODUCT INQUIRIES
CONTACT LIV BUILDING
PRODUCTS AT
905-852-3733

SEE NOTES ON DRAWING S1

SCALE: 3/4" = 1'-0"	
DATE: APRIL, 2014	
DRAWN SJB	CHECKED SJB

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ENGINEER'S SEAL



PROJECT:

LIV BUILDING PRODUCTS
RESIDENTIAL INVISIRAIL GUARD

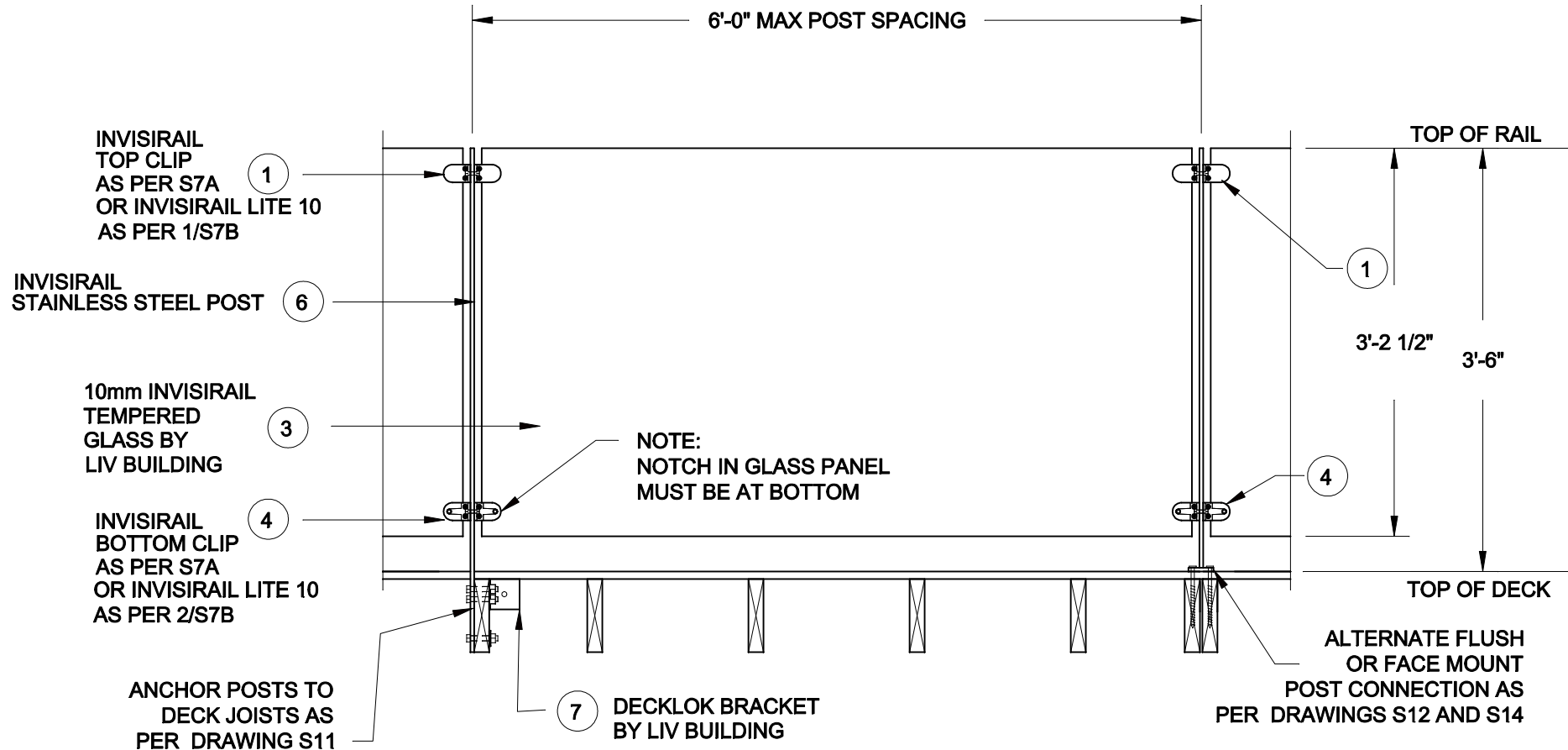
42" GUARD WITH 4x4 POSTS

PROJECT No.:

14-079

DRAWING No.:

S2 R1



FOR PRODUCT INQUIRIES
CONTACT LIV BUILDING
PRODUCTS AT
905-852-3733

SEE NOTES ON DRAWING S1

SCALE:
3/4" = 1'-0"

DATE:
APRIL, 2014

DRAWN	CHECKED
SJB	SJB

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APR 28, 2016

PROJECT:

LIV BUILDING PRODUCTS
RESIDENTIAL INVISIRAIL GUARD

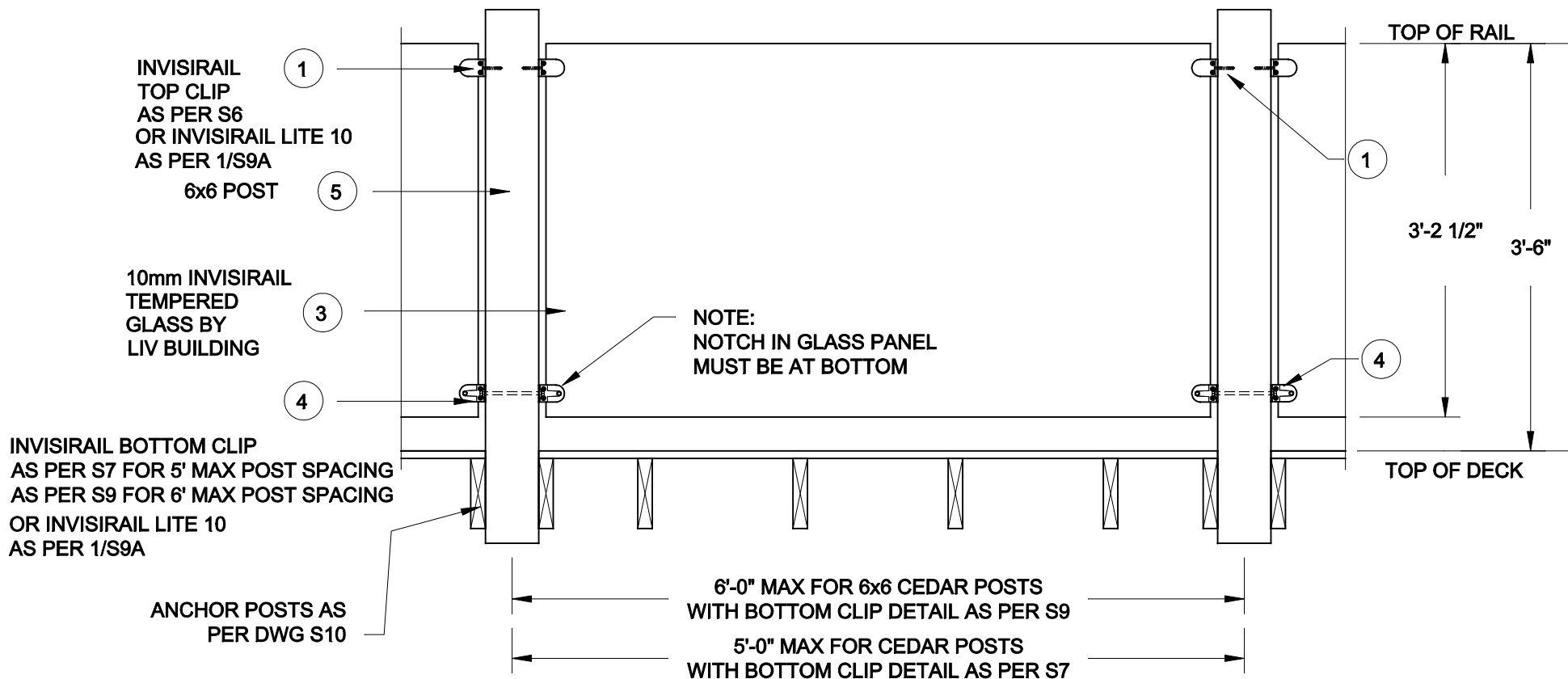
42" GUARD WITH
INVISIRAIL STEEL POSTS

PROJECT No.:

14-079

DRAWING No.:

S2A R1



1
S3 42" GUARD w/
6x6 POSTS

FOR PRODUCT INQUIRIES
CONTACT LIV BUILDING
PRODUCTS AT
905-852-3733

SEE NOTES ON DRAWING S1

SCALE: 3/4" = 1'-0"	
DATE: APRIL, 2014	
DRAWN SJB	CHECKED SJB

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APR 28, 2016

PROJECT:

LIV BUILDING PRODUCTS
RESIDENTIAL INVISIRAIL GUARD

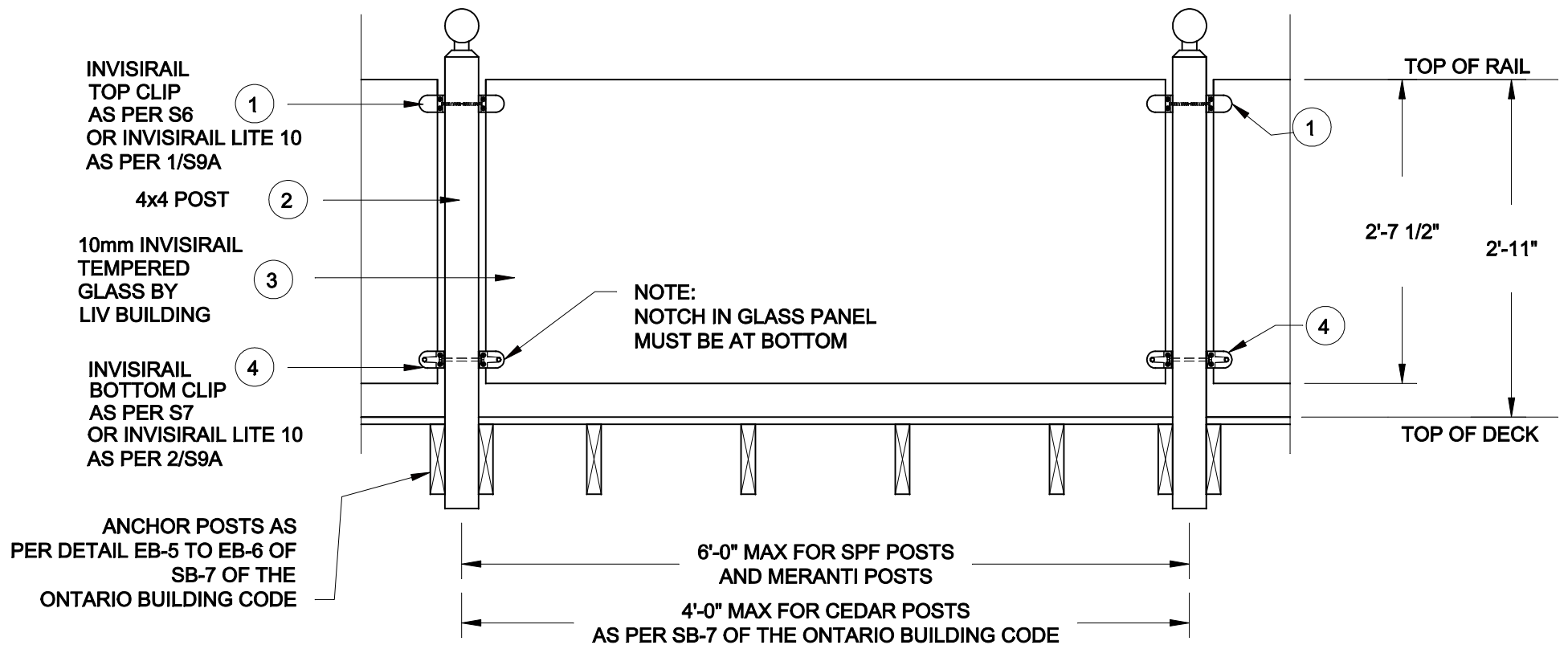
42" GUARD WITH 6x6 CEDAR
POSTS

PROJECT No.:

14-079

DRAWING No.:

S3 R1



1
S4 35" GUARD w/
4x4 POSTS

IMPORTANT NOTE:
THE 2'-11" GUARD MAY ONLY BE
USED FOR DECKS SERVING ONE
DWELLING UNIT AND WHERE
THE TOP OF THE DECK IS NOT
MORE THAN 5'-11" ABOVE
GROUND LEVEL.

FOR PRODUCT INQUIRIES
CONTACT LIV BUILDING
PRODUCTS AT
905-852-3733

SEE NOTES ON DRAWING S1

SCALE: 3/4" = 1'-0"	
DATE: APRIL, 2014	
DRAWN SJB	CHECKED SJB

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APR 28, 2016

PROJECT:

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RESIDENTIAL INVISIRAIL GUARD

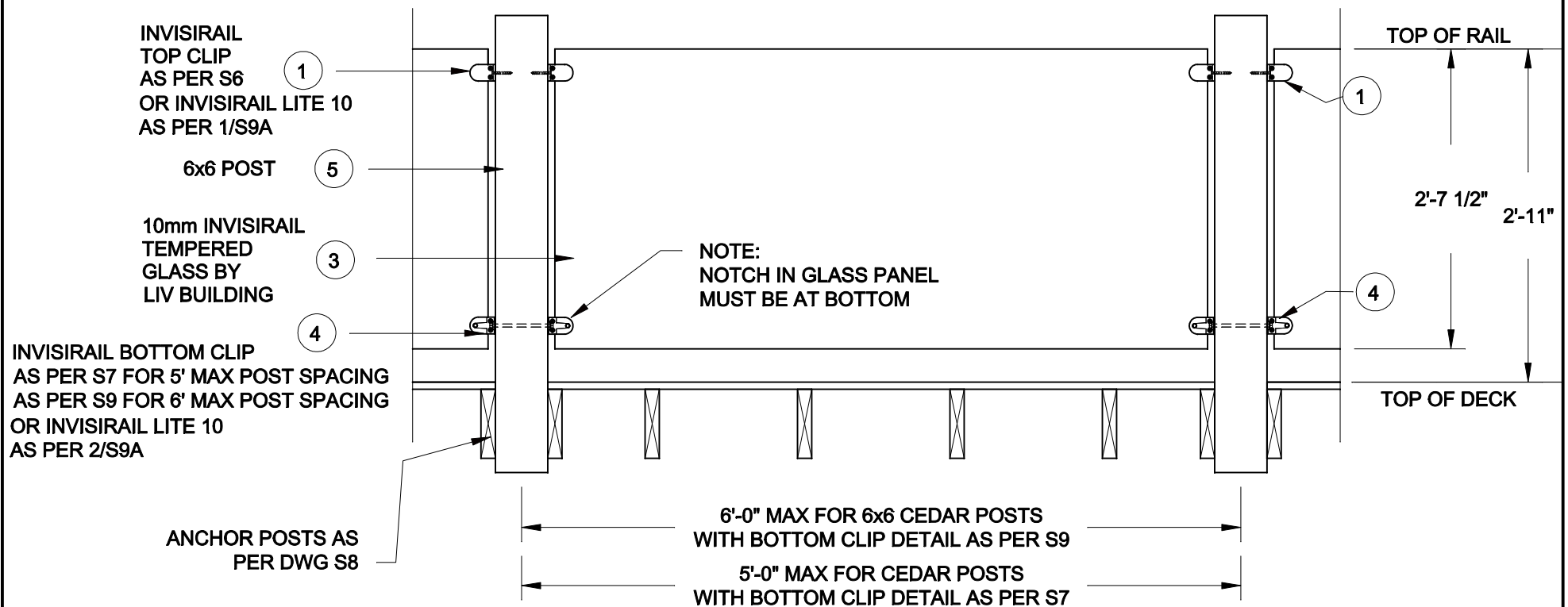
35" GUARD WITH 4x4 POSTS

PROJECT No.:

14-079

DRAWING No.:

S4 R1



1
S5 35" GUARD w/
6x6 POSTS

IMPORTANT NOTE:
THE 2'-11" GUARD MAY ONLY BE
USED FOR DECKS SERVING ONE
DWELLING UNIT AND WHERE
THE TOP OF THE DECK IS NOT
MORE THAN 5'-11" ABOVE
GROUND LEVEL.

FOR PRODUCT INQUIRIES
CONTACT LIV BUILDING
PRODUCTS AT
905-852-3733

SEE NOTES ON DRAWING S1

SCALE: 3/4" = 1'-0"	
DATE: APRIL, 2014	
DRAWN SJB	CHECKED SJB

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APR 28, 2016

PROJECT:

LIV BUILDING PRODUCTS
RESIDENTIAL INVISIRAIL GUARD

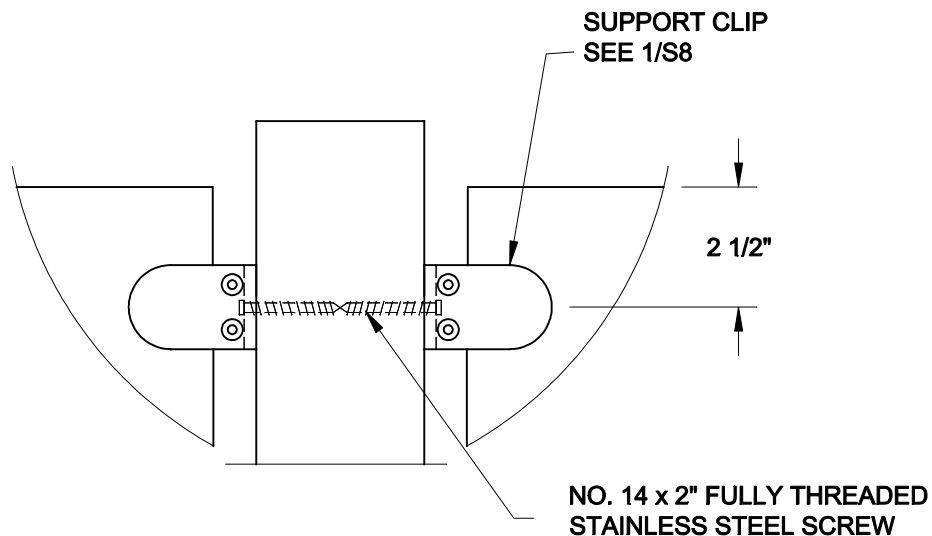
35" GUARD WITH 6x6 CEDAR
POSTS

PROJECT No.:

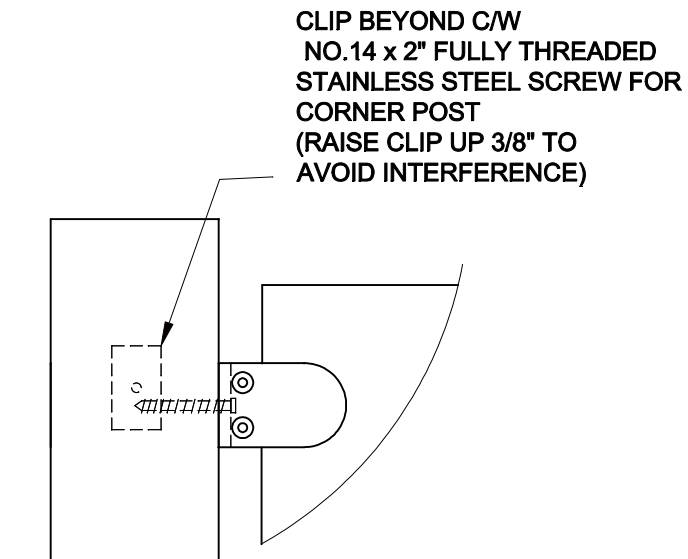
14-079

DRAWING No.:

S5 R1



1
S6 TOP CLIP - INTERMEDIATE POST



2
S6 TOP CLIP - END / CORNER POST

FOR PRODUCT INQUIRIES
CONTACT LIV BUILDING
PRODUCTS AT
905-852-3733

SEE NOTES ON DRAWING S1

SCALE: 3" = 1'-0"	
DATE: APRIL, 2014	
DRAWN SJB	CHECKED SJB

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ENGINEER'S SEAL



PROJECT:

LIV BUILDING PRODUCTS
RESIDENTIAL INVISIRAIL GUARD

INVISIRAIL TOP CLIP DETAILS

PROJECT No.:

14-079

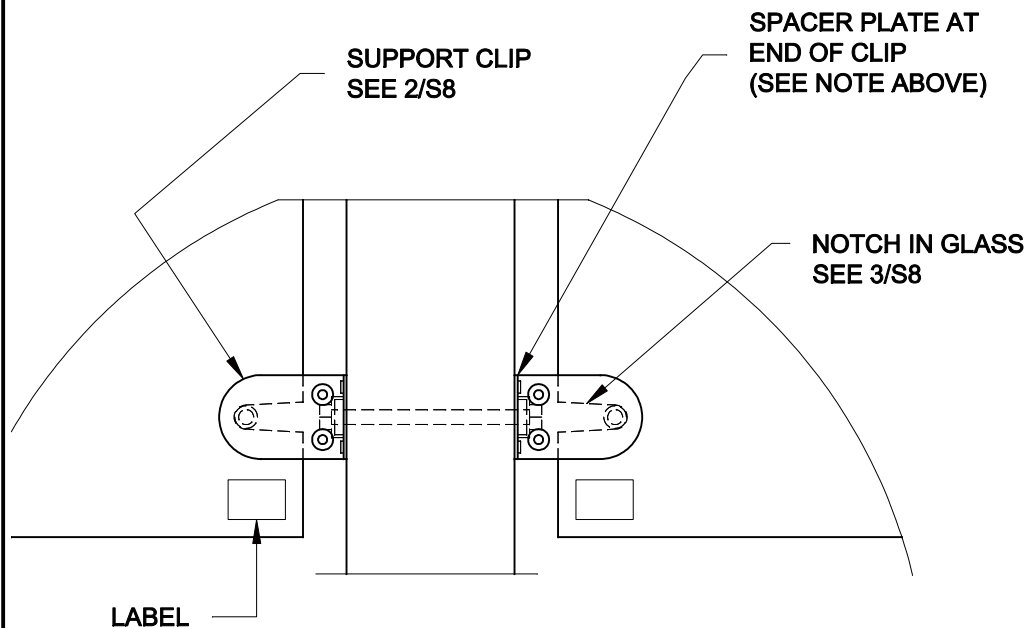
DRAWING No.:

S6

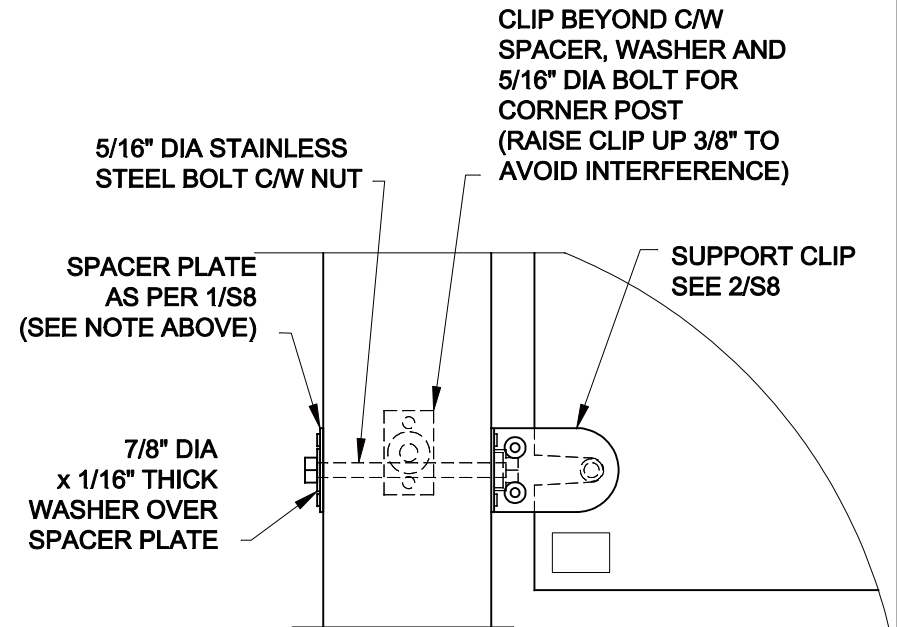
NOTE:

SPACER PLATES MAY BE OMITTED FOR THE FOLLOWING:

- SPF AND CEDAR POSTS SPACED UP TO 4'-0" O/C
- MERANTI POSTS SPACED UP TO 6'-0" O/C



1
S7 **BOTTOM CLIP - INTERMEDIATE POST**



2
S7 **BOTTOM CLIP - END / CORNER POST**

FOR PRODUCT INQUIRIES
CONTACT LIV BUILDING
PRODUCTS AT
905-852-3733

SEE NOTES ON DRAWING S1

SCALE: 3" = 1'-0"	
DATE: APRIL, 2014	
DRAWN SJB	CHECKED SJB

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APR 28, 2016

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RESIDENTIAL INVISIRAIL GUARD

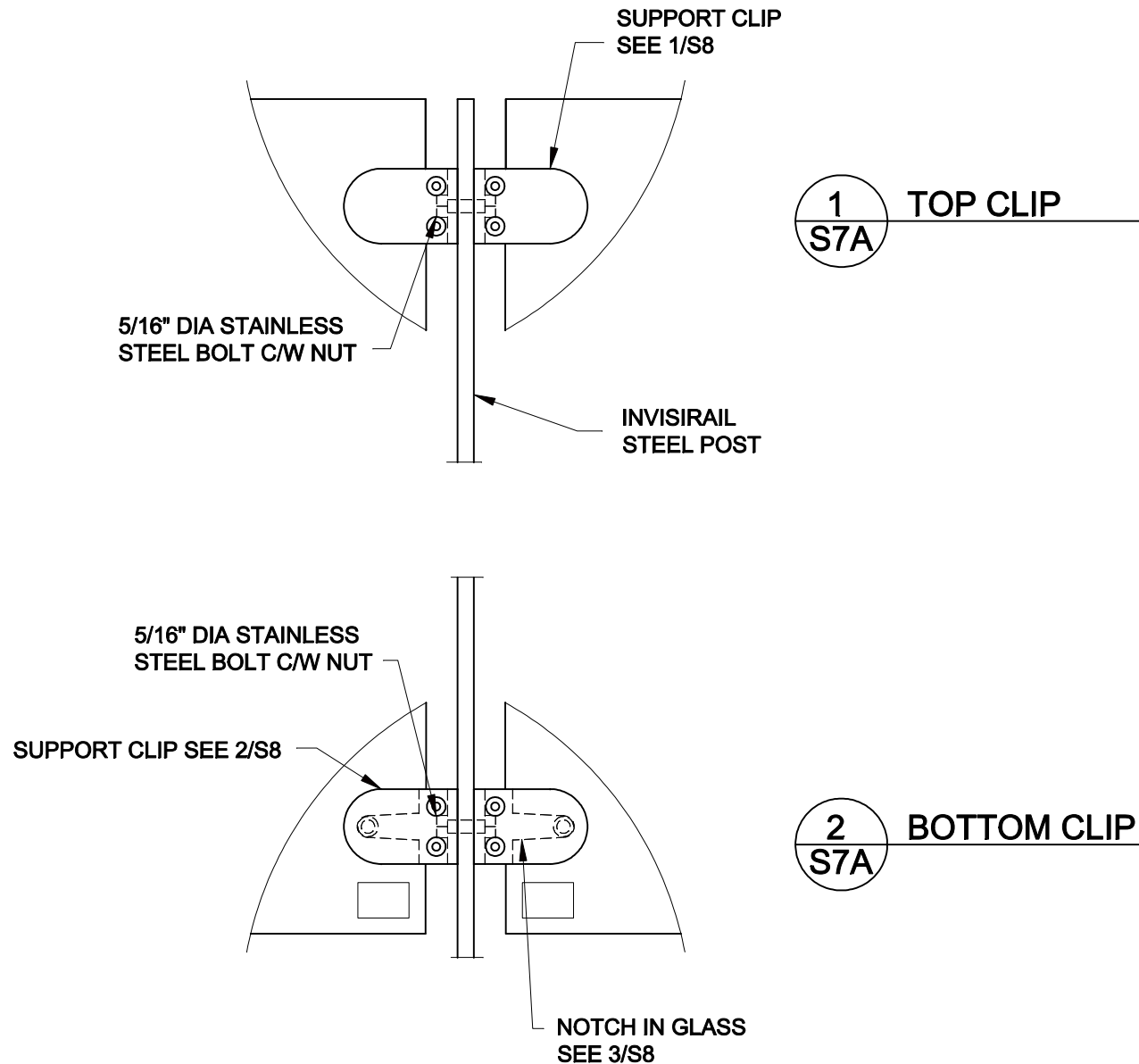
INVISIRAIL BOTTOM CLIP DETAILS

PROJECT No.:

14-079

DRAWING No.:

S7



FOR PRODUCT INQUIRIES
CONTACT LIV BUILDING
PRODUCTS AT
905-852-3733

SEE NOTES ON DRAWING S1

SCALE:

3" = 1'-0"

DATE:

APRIL, 2014

DRAWN

SJB

CHECKED

SJB

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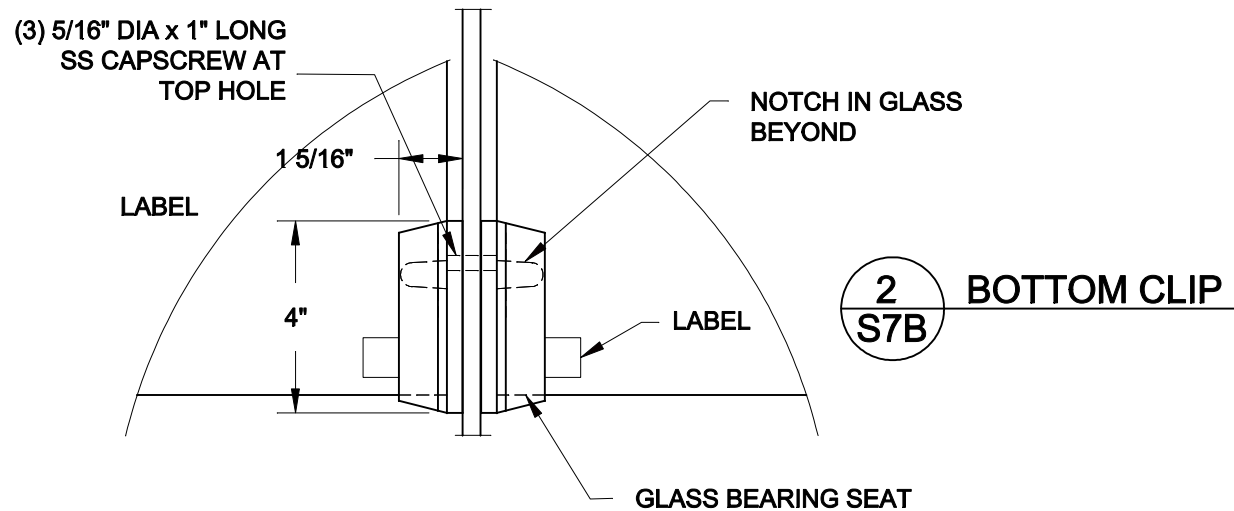
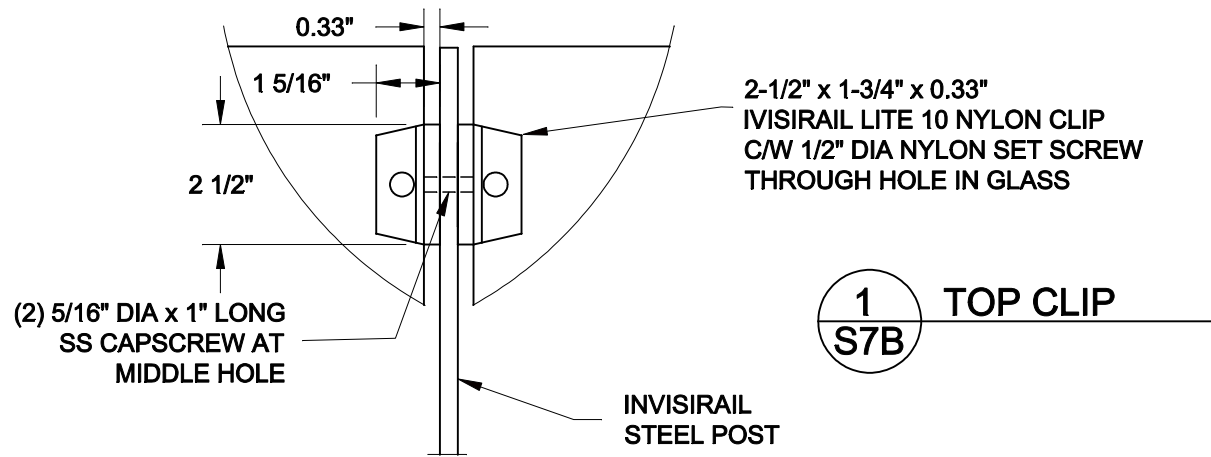
INVISIRAIL POST CLIP DETAILS

PROJECT No.:

14-079

DRAWING No.:

S7 A



FOR PRODUCT INQUIRIES
CONTACT LIV BUILDING
PRODUCTS AT
905-852-3733

SEE NOTES ON DRAWING S1

SCALE:

3" = 1'-0"

DATE:

APRIL, 2014

DRAWN

SJB

CHECKED

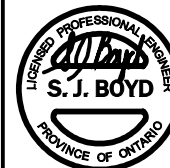
SJB

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ENGINEER'S SEAL



APR 28, 2016

PROJECT:

LIV BUILDING PRODUCTS
RESIDENTIAL INVISIRAIL GUARD

INVISIRAIL LITE 10
POST CLIP DETAILS

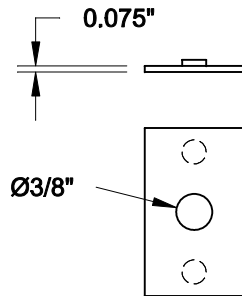
PROJECT No.:

14-079

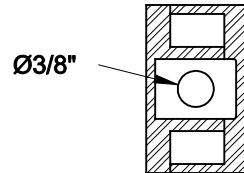
DRAWING No.:

S7 B

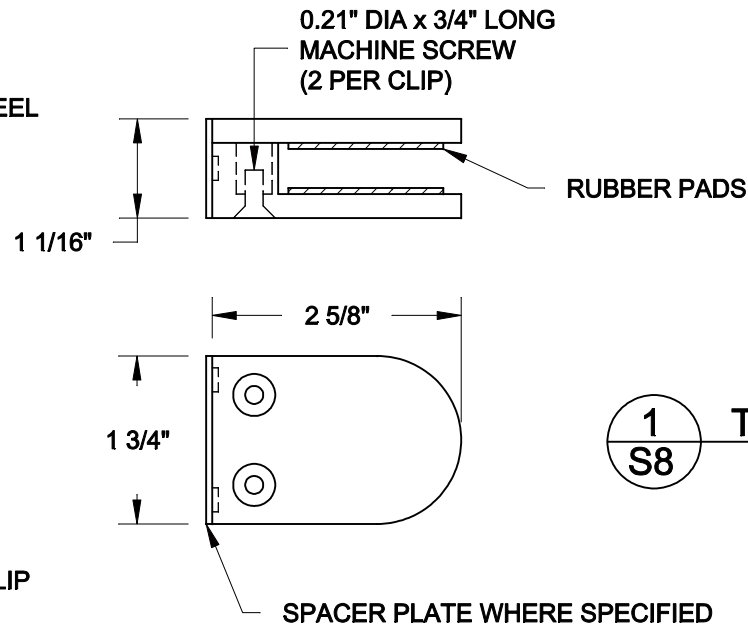
NOTE: ALL STEEL TO BE STAINLESS STEEL



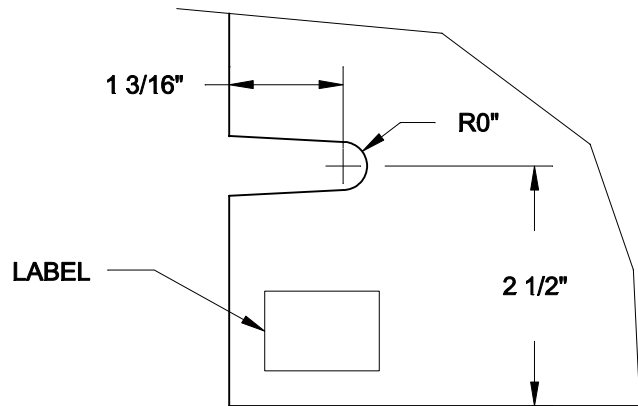
SPACER PLATE



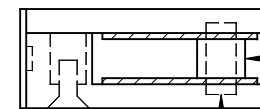
END VIEW OF CLIP



1 TOP CLIP
S8

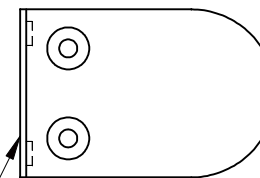


3 GLASS NOTCH DETAIL (BOTTOM ONLY)
S8



NYLON SLEEVE

5/16" DIA x
3/4" LONG PIN



SPACER PLATE
SEE 1/S6

2 BOTTOM CLIP
S8

NOTE: BOTTOM CLIP IS THE SAME AS THE TOP CLIP EXCEPT FOR PIN AND SLEEVE AS SHOWN

FOR PRODUCT INQUIRIES
CONTACT LIV BUILDING
PRODUCTS AT
905-852-3733

SEE NOTES ON DRAWING S1

SCALE:
1" = 2"

DATE:
APRIL, 2014

DRAWN
SJB

CHECKED
SJB

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APR 28, 2016

PROJECT:

LIV BUILDING PRODUCTS
RESIDENTIAL INVISIRAIL GUARD

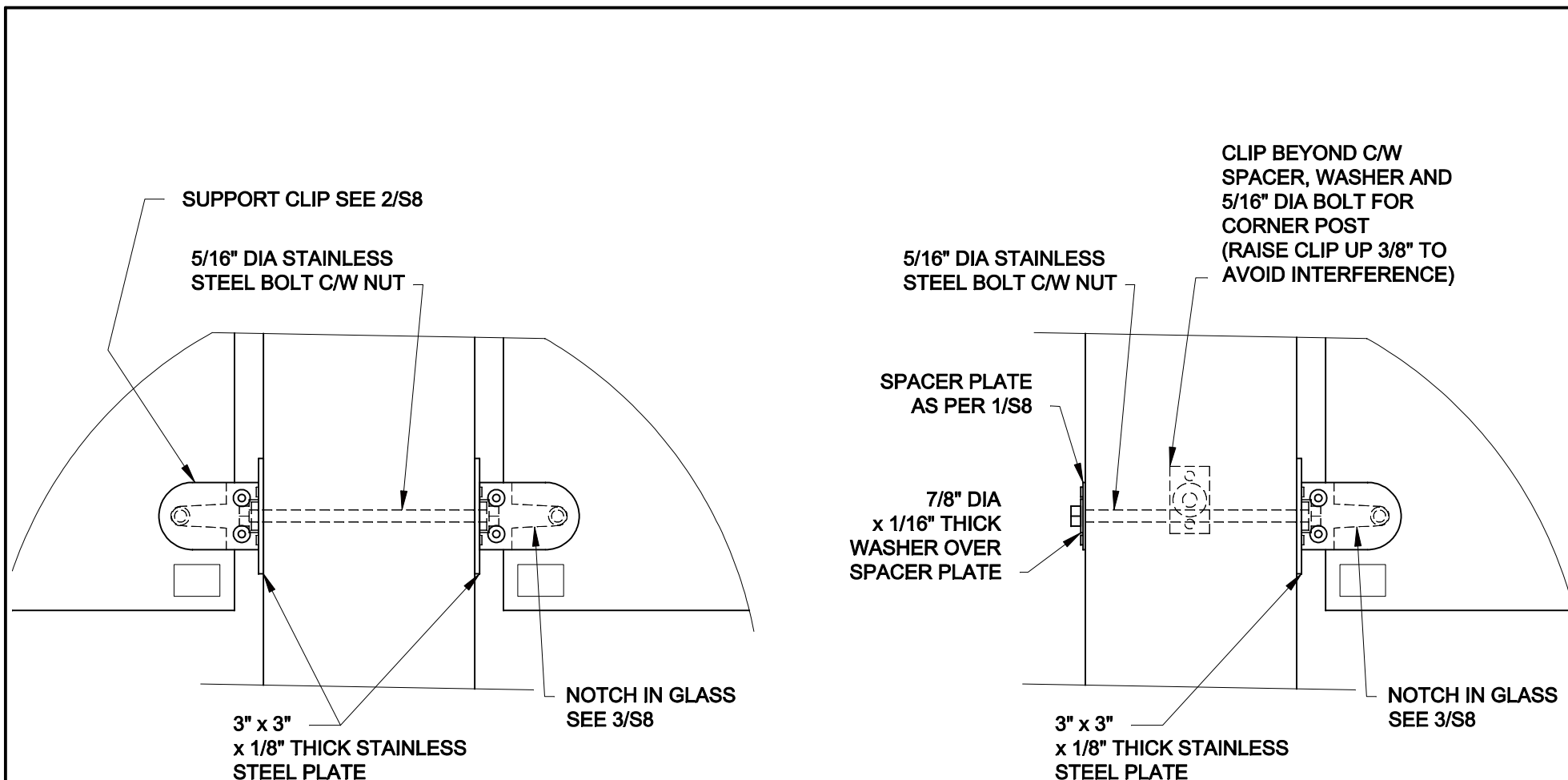
INVISIRAIL SUPPORT CLIP AND
GLASS NOTCH DETAILS

PROJECT No.:

14-079

DRAWING No.:

S8



1
S9 **BOTTOM CLIP - INTERMEDIATE POST**

2
S9 **BOTTOM CLIP - CORNER POST**

FOR PRODUCT INQUIRIES
CONTACT LIV BUILDING
PRODUCTS AT
905-852-3733

SEE NOTES ON DRAWING S1

SCALE:
3" = 1'-0"

DATE:
APRIL, 2014

DRAWN	CHECKED
SJB	SJB

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APR 28, 2016

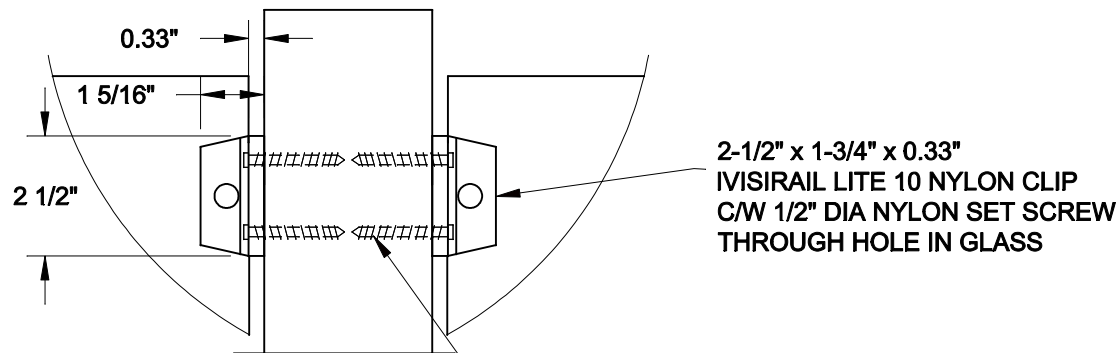
PROJECT:

LIV BUILDING PRODUCTS
RESIDENTIAL INVISIRAIL GUARD

INVISIRAIL BOTTOM CLIP DETAILS
FOR 6x6 CEDAR POSTS AT 6' O/C

PROJECT No.:
14-079

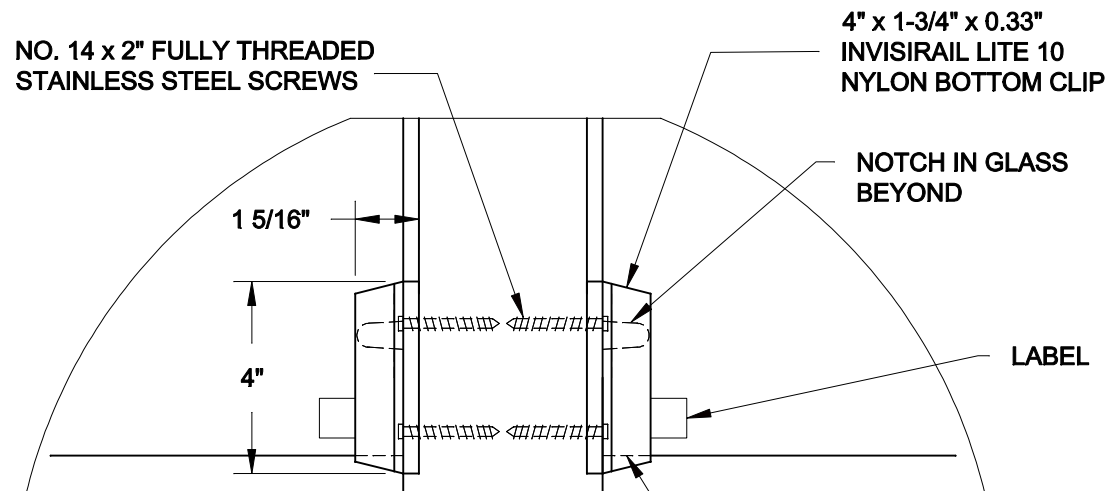
DRAWING No.:
S9



1
S9A

TOP CLIP DETAIL

NO. 14 x 2" FULLY THREADED
STAINLESS STEEL SCREW



2
S9A

BOTTOM CLIP DETAIL

GLASS BEARING SEAT

FOR PRODUCT INQUIRIES
CONTACT LIV BUILDING
PRODUCTS AT
905-852-3733

SEE NOTES ON DRAWING S1

SCALE:
3" = 1'-0"

DATE:
APRIL, 2014

DRAWN	CHECKED
SJB	SJB

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APR 28, 2016

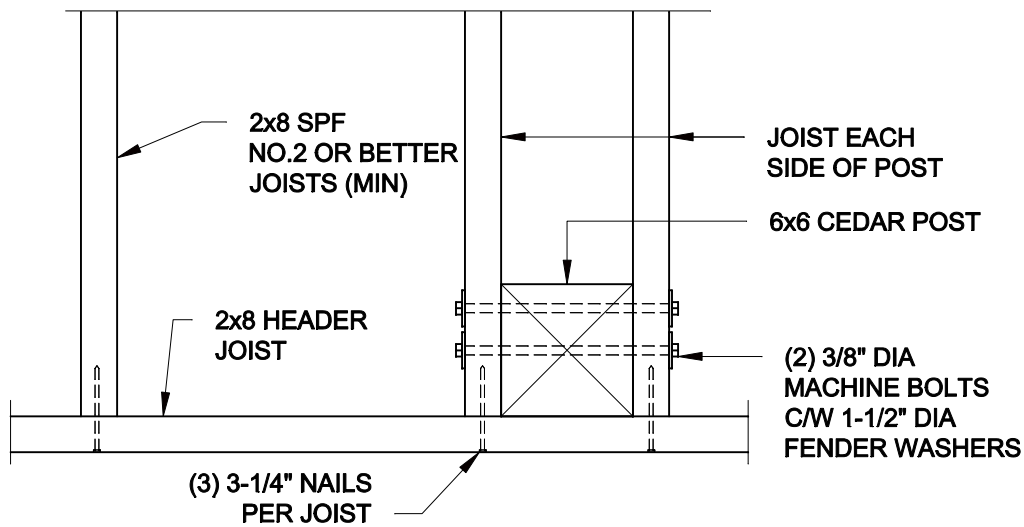
PROJECT:

LIV BUILDING PRODUCTS
RESIDENTIAL INVISIRAIL GUARD

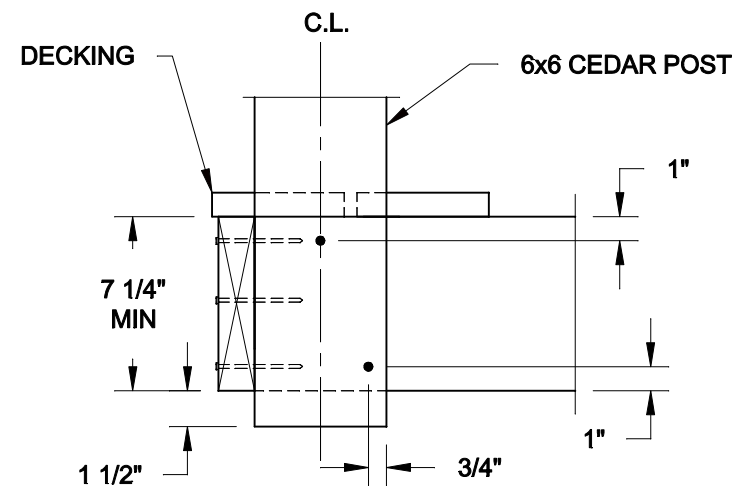
INVISIRAIL LITE 10
CLIP DETAILS FOR WOOD POSTS

PROJECT No.:
14-079

DRAWING No.:
S9A



PLAN VIEW



SECTION

1
S10 **6x6 CEDAR POST TO JOIST CONNECTION**
1-1/2" = 1'-0"

NOTE:

1. FASTENERS TO HAVE A CORROSION RESISTANT COATING AS PER SB-7 OF THE ONTARIO BUILDING CODE, OR SHALL BE STAINLESS STEEL.
2. THIS DETAIL IS ADAPTED FROM DETAIL EB-5 OF SB-7 OF THE ONTARIO BUILDING CODE AND EVALUATED FOR 6x6 CEDAR POSTS SPACED UP TO 6' O/C

FOR PRODUCT INQUIRIES
CONTACT LIV BUILDING
PRODUCTS AT
905-852-3733

SEE NOTES ON DRAWING S1

SCALE:
AS NOTED

DATE:
APRIL, 2014

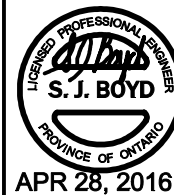
DRAWN SJB	CHECKED SJB
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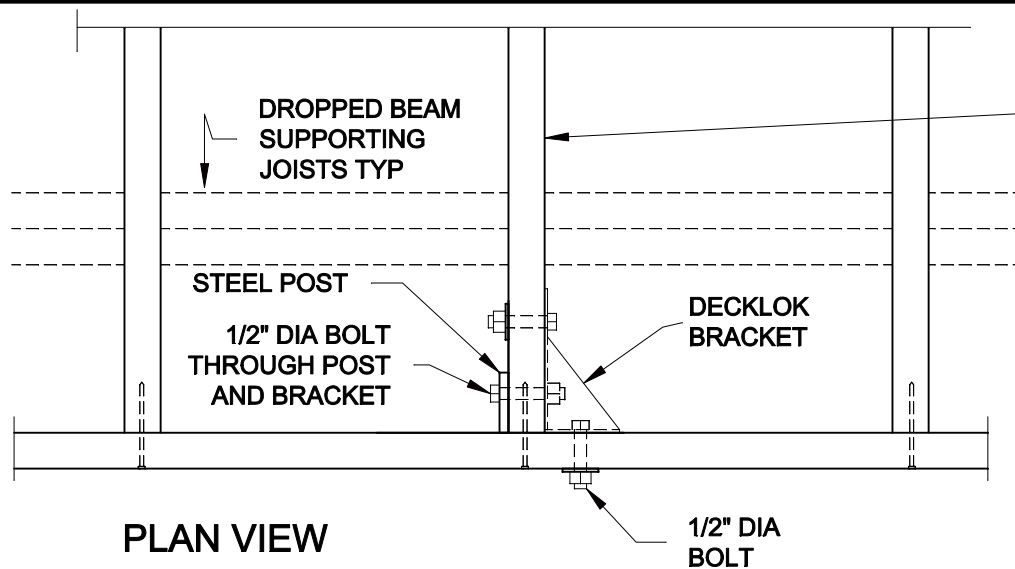
PROJECT:

LIV BUILDING PRODUCTS
RESIDENTIAL INVISIRAIL GUARD

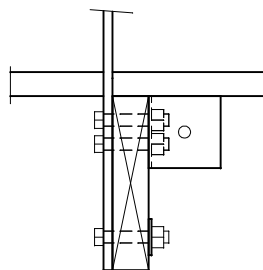
6x6 POST ANCHORAGE DETAIL

PROJECT No.:
14-079

DRAWING No.:
S10



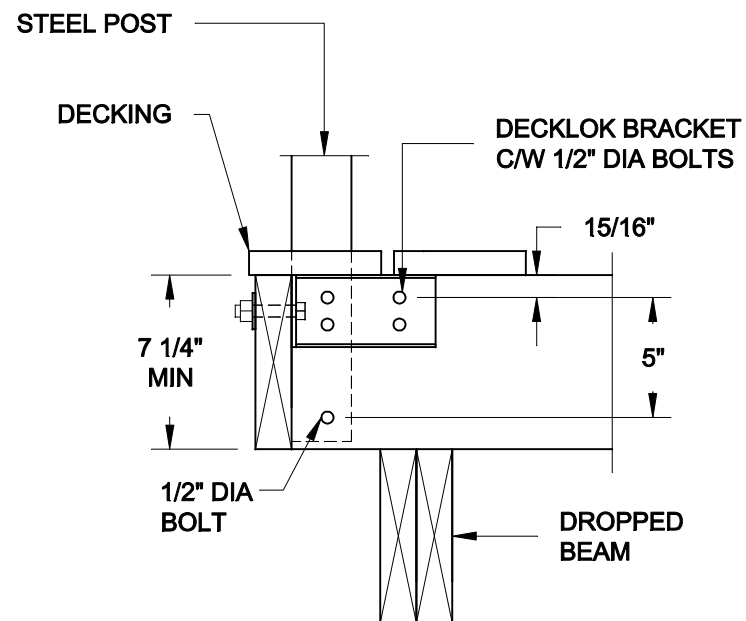
PLAN VIEW



ELEVATION

2x8 NO.2 SPF JOISTS MIN

NOTE:
FASTEN STEEL POST TO 2X8 BLOCKING WHERE THE
GUARD IS PARALLEL TO THE FLOOR JOISTS. FASTEN
BLOCKING TO ADJACENT FLOOR JOIST WITH 3 3-1/2"
END-NAIls AS PER DETAIL EB6 OF SB-7
OF THE ONTARIO BUILDING CODE.



SECTION

1
S11 **INVISIRAIL STEEL POST TO JOIST CONNECTION**
1-1/2" = 1'-0"

NOTE: BOLTS TO BE STAINLESS STEEL.

FOR PRODUCT INQUIRIES
CONTACT LIV BUILDING
PRODUCTS AT
905-852-3733

SEE NOTES ON DRAWING S1

SCALE:
AS NOTED

DATE:
APRIL, 2014

DRAWN SJB	CHECKED SJB
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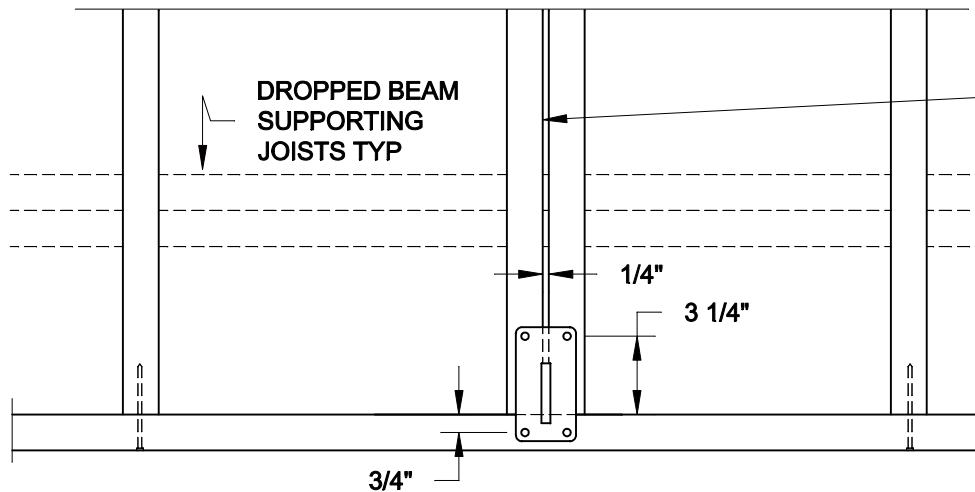
PROJECT:

LIV BUILDING PRODUCTS
RESIDENTIAL INVISIRAIL GUARD

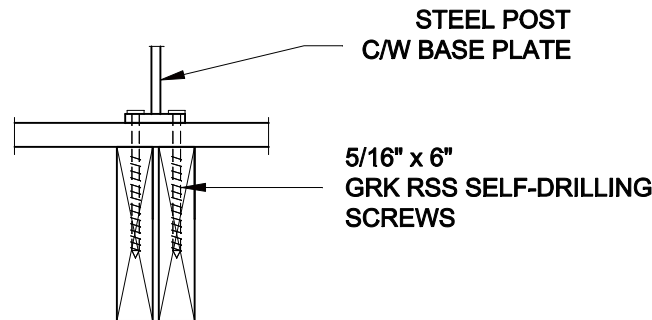
INVISIRAIL STEEL POST TO JOIST
CONNECTION DETAIL

PROJECT No.:
14-079

DRAWING No.:
S11



PLAN VIEW

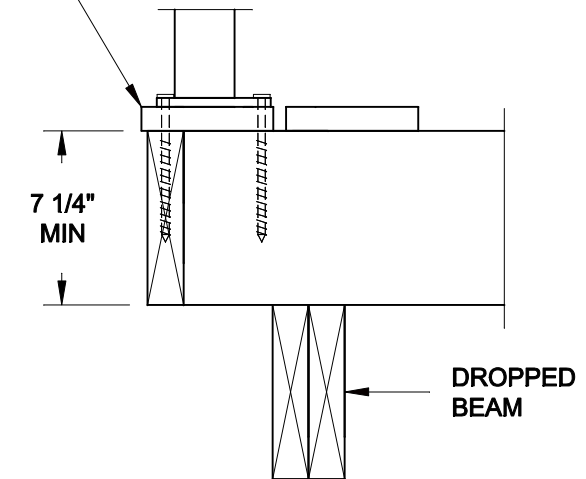


ELEVATION

DOUBLE 2x8 NO.2 SPF JOIST MIN

NOTE:
FASTEN STEEL POST TO 2X8 BLOCKING WHERE THE
GUARD IS PARALLEL TO THE FLOOR JOISTS. FASTEN
BLOCKING TO ADJACENT FLOOR JOIST WITH 3 3-1/2"
END-NAILS AS PER DETAIL EB6 OF SB-7
OF THE ONTARIO BUILDING CODE.

5/4 KAYU DECK, 1" TREX TRANSCENDS DECK,
1" GOSSEN PVC DECK, 7/8" DECKORATORS
CLASSIC DECK, OR 1-1/2 x 5-1/2" 5/4 KAYU BLOCK
BETWEEN BASE PLATE AND JOISTS



SECTION

1
S12

FLUSH MOUNT INVISIRAIL STEEL POST CONNECTION

1-1/2" = 1'-0"

NOTE: BASEPLATE MAY ONLY BEAR DIRECTLY ON SPECIFIED DECKING PRODUCTS- SEE SECTION.

FOR PRODUCT INQUIRIES
CONTACT LIV BUILDING
PRODUCTS AT
905-852-3733

SEE NOTES ON DRAWING S1

SCALE:
AS NOTED

DATE:
APRIL, 2014

DRAWN	CHECKED
SJB	SJB

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APR 28, 2016

PROJECT:

LIV BUILDING PRODUCTS
RESIDENTIAL INVISIRAIL GUARD

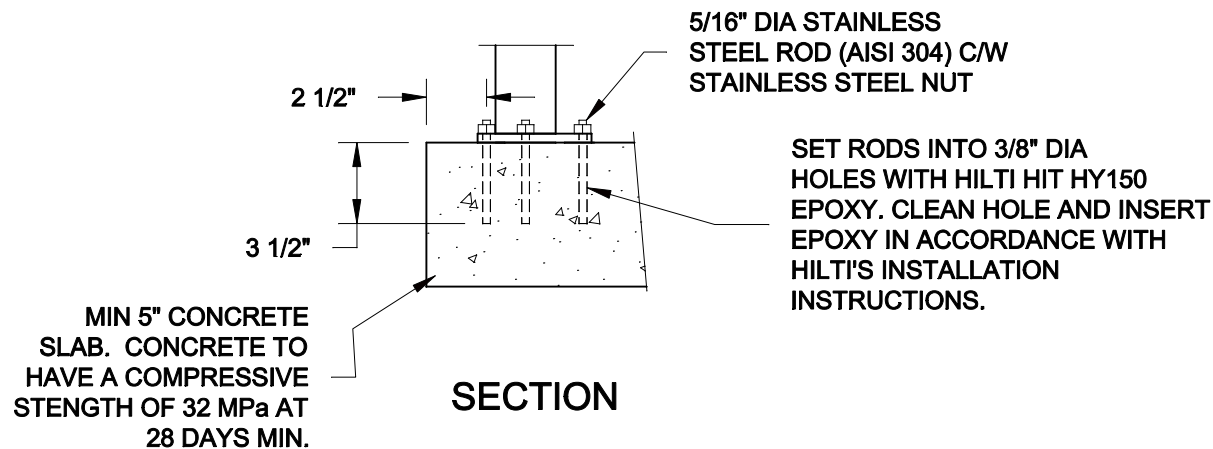
FLUSH MOUNT STEEL POST
CONNECTION DETAIL

PROJECT No.:

14-079

DRAWING No.:

S12 R1



1
S12A **FLUSH MOUNT INVISIRAIL STEEL POST CONNECTION - CONCRETE SLAB**
1-1/2" = 1'-0"

FOR PRODUCT INQUIRIES
CONTACT LIV BUILDING
PRODUCTS AT
905-852-3733

SEE NOTES ON DRAWING S1

SCALE: AS NOTED	
DATE: APRIL, 2014	
DRAWN SJB	CHECKED SJB

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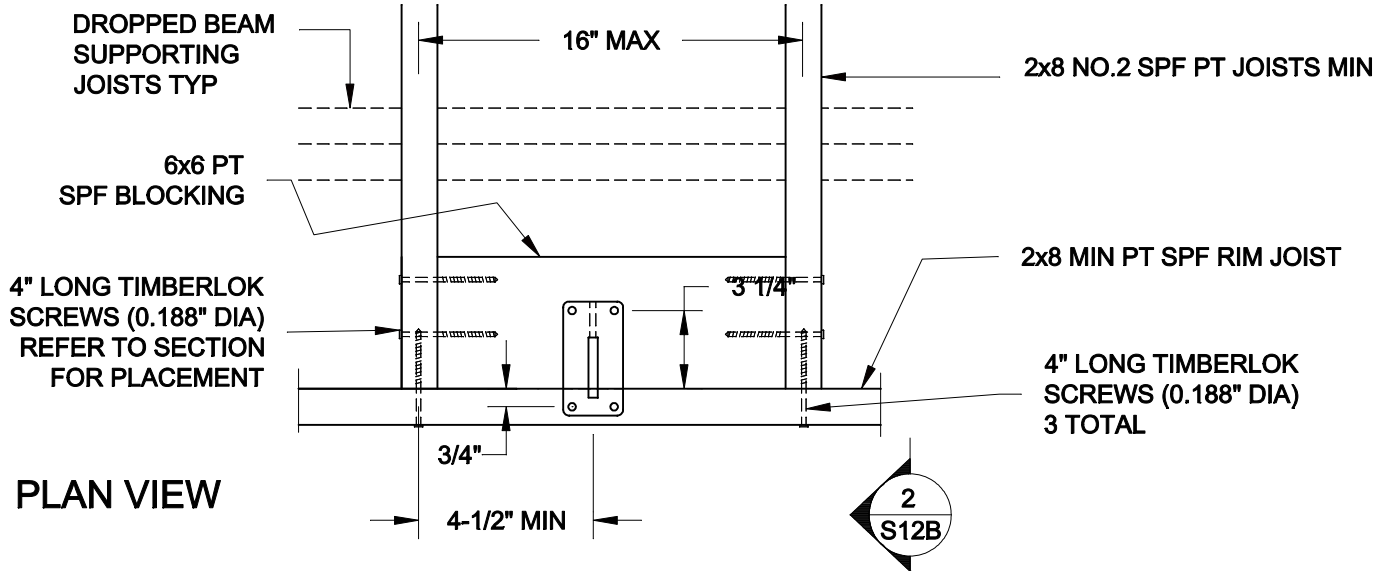
FLUSH MOUNT INVISIRAIL POST
DETAIL FOR CONCRETE SLAB

PROJECT No.:

14-079

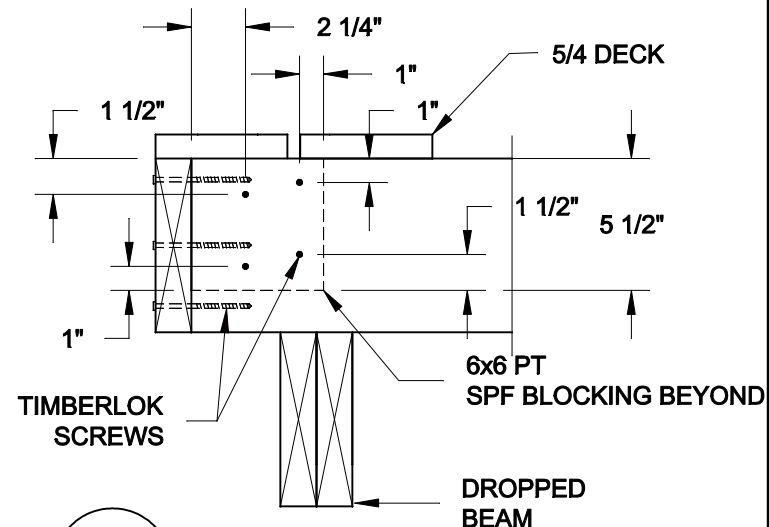
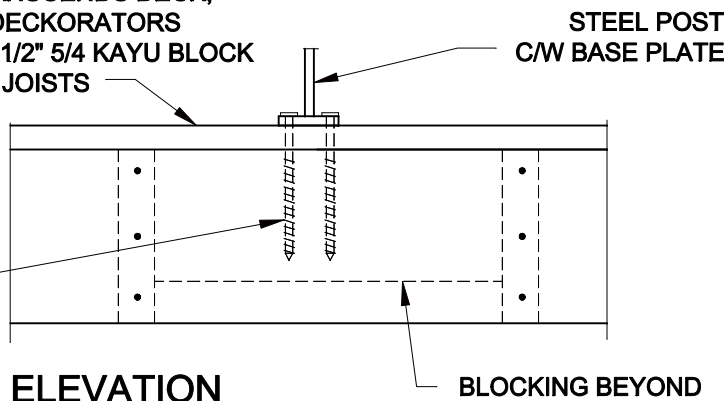
DRAWING No.:

S12A



5/4 KAYU DECK, 1" TREX TRANSCENDS DECK,
1" GOSSEN PVC DECK, 7/8" DECKORATORS
CLASSIC DECK, OR 1-1/2 x 5-1/2" 5/4 KAYU BLOCK
BETWEEN BASE PLATE AND JOISTS

5/16" x 6"
GRK RSS SELF-DRILLING
SCREWS



1 **S12B** **ALT FLUSH MOUNT STEEL POST CONNECTION** 1-1/2" = 1'-0"

NOTE: BASEPLATE MAY ONLY BEAR DIRECTLY
ON SPECIFIED DECKING PRODUCTS- SEE SECTION.

2 **S12B** **SECTION** 1-1/2" = 1'-0"

FOR PRODUCT INQUIRIES
CONTACT LIV BUILDING
PRODUCTS AT
905-852-3733

SEE NOTES ON DRAWING S1

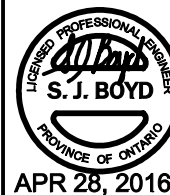
SCALE: AS NOTED	
DATE: APRIL, 2014	
DRAWN SJB	CHECKED SJB

QUAILE ENGINEERING LTD.



38 Parkside Drive, UNIT 7
Newmarket, ON
L3Y 8J9
T: 905-853-8547
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ENGINEER'S SEAL



PROJECT:

LIV BUILDING PRODUCTS
RESIDENTIAL INVISIRAIL GUARD

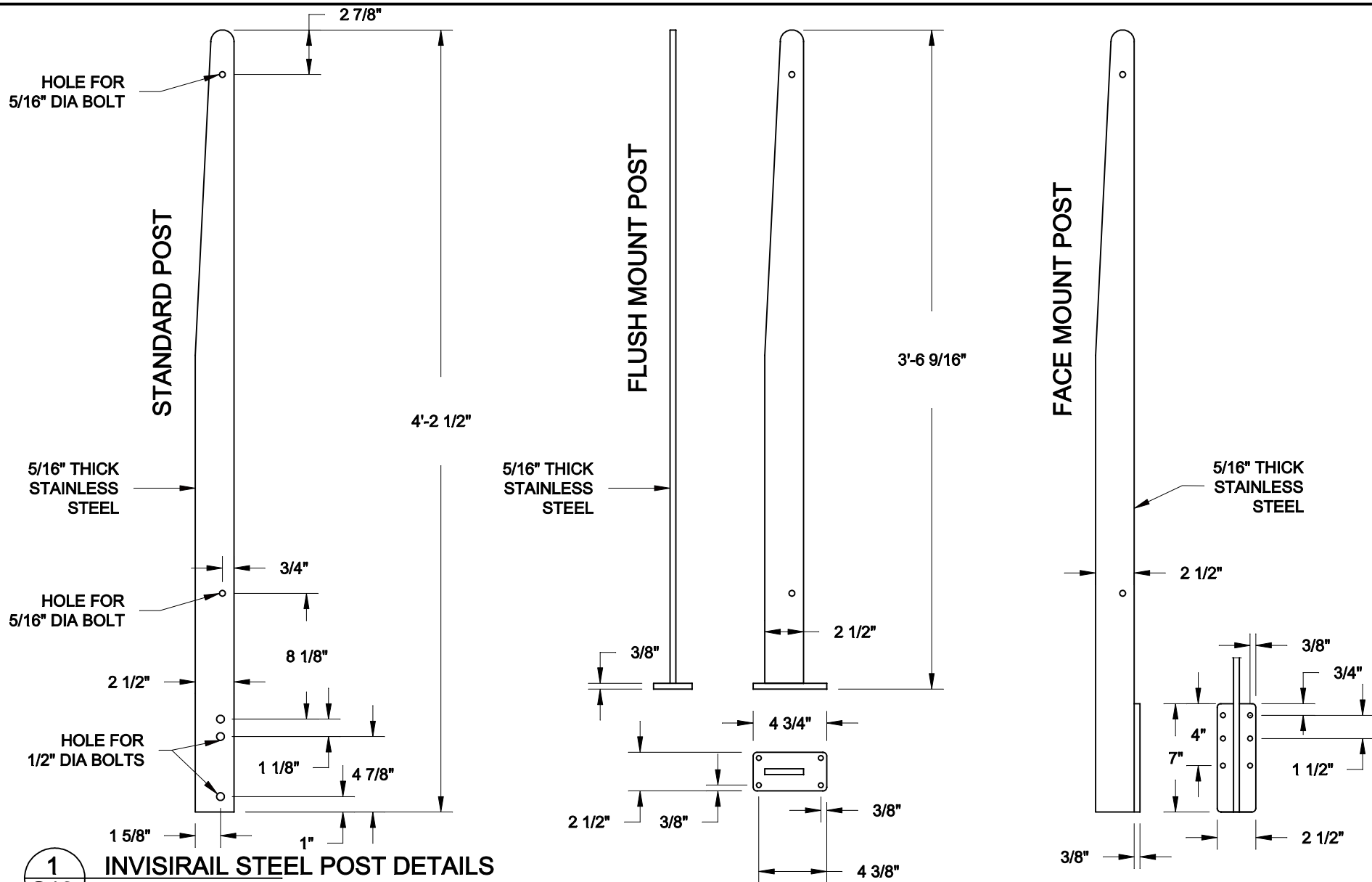
FLUSH MOUNT INVISIRAIL POST
CONNECTION DETAIL

PROJECT No.:

14-079

DRAWING No.:

S12B R1



1
S13 INVISIRAIL STEEL POST DETAILS
NTS

FOR PRODUCT INQUIRIES
CONTACT LIV BUILDING
PRODUCTS AT
905-852-3733

SEE NOTES ON DRAWING S1

SCALE:
AS NOTED

DATE:
APRIL, 2014

DRAWN SJB	CHECKED SJB
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ENGINEER'S SEAL



APR 28, 2016

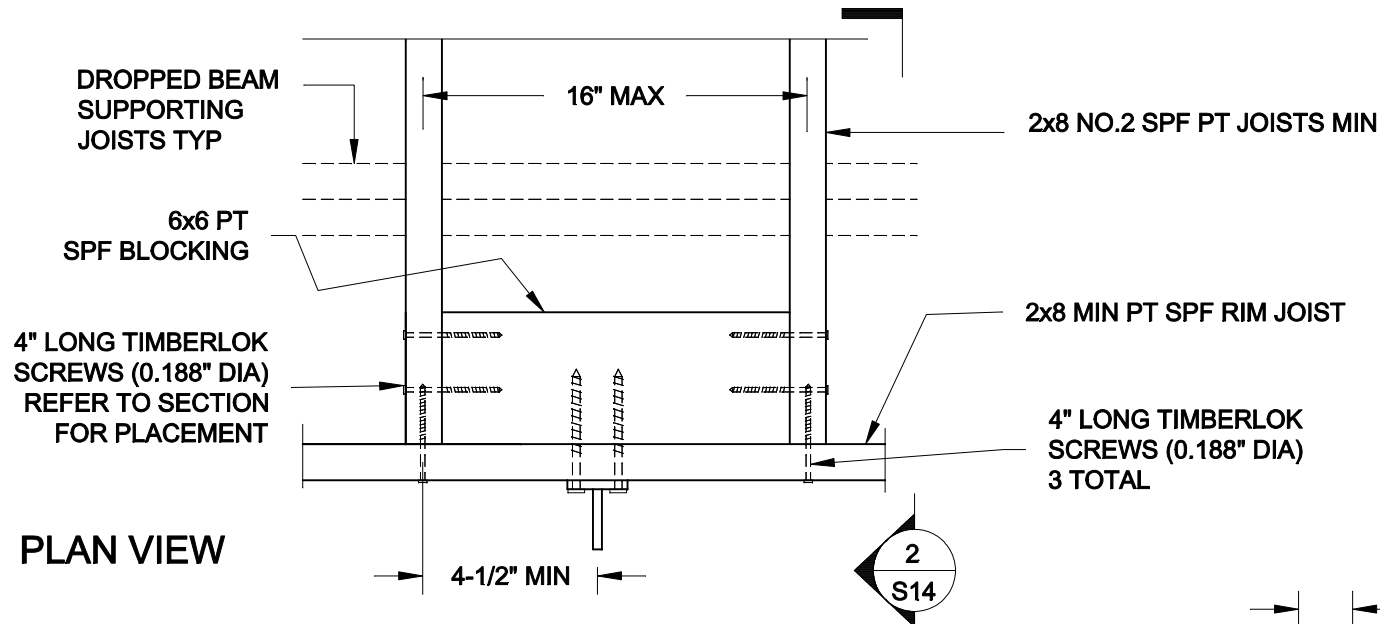
PROJECT:

LIV BUILDING PRODUCTS
RESIDENTIAL INVISIRAIL GUARD

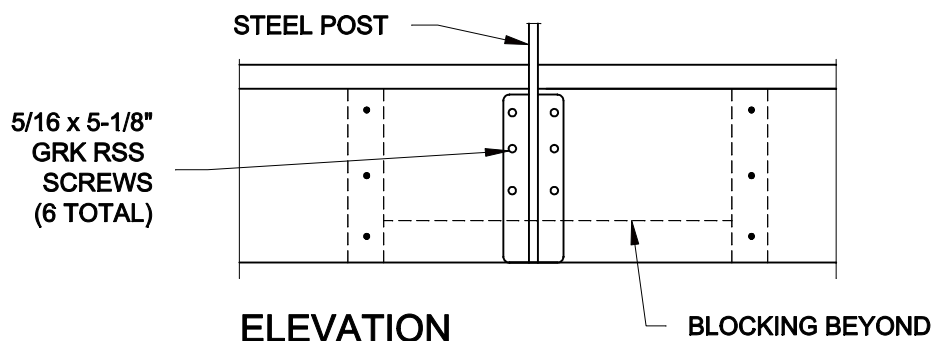
INVISIRAIL STEEL POST DETAILS

PROJECT No.:
14-079

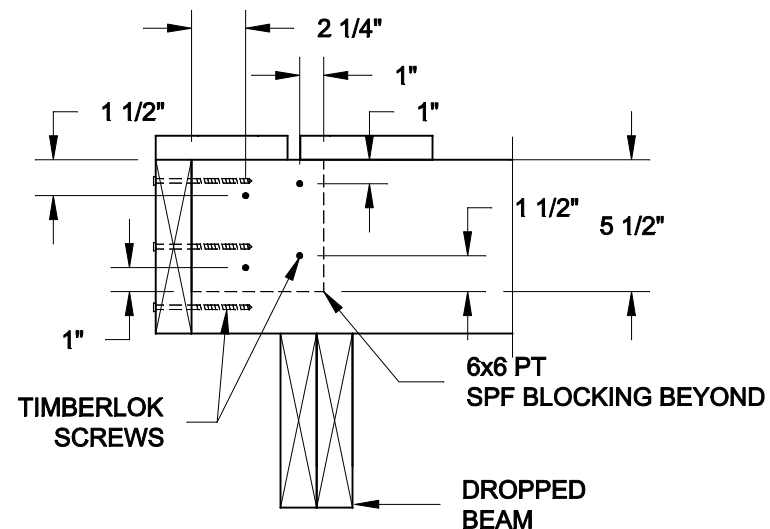
DRAWING No.:
S13 R1



PLAN VIEW



ELEVATION



2
S14
SECTION
1-1/2" = 1'-0"

1
S14
FACE MOUNT STEEL POST CONNECTION
1-1/2" = 1'-0"

FOR PRODUCT INQUIRIES
CONTACT LIV BUILDING
PRODUCTS AT
905-852-3733

SEE NOTES ON DRAWING S1

SCALE: AS NOTED	
DATE: APRIL, 2014	
DRAWN SJB	CHECKED SJB

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ENGINEER'S SEAL



APR 28, 2016

PROJECT:

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RESIDENTIAL INVISIRAIL GUARD

FLUSH MOUNT INVISIRAIL POST
CONNECTION DETAIL

PROJECT No.:

14-079

DRAWING No.:

S14