

**KEY**  
 □ STEEL UNIAXIAL STRAIN GAUGE  
 ■ CONCRETE UNIAXIAL STRAIN GAUGE  
 ▤ TRIAXIAL STRAIN GAUGE

**NOTE:** LOCATE SG ON CENTER OF FLANGE OR UNDERSIDE OF FLANGE 50mm FROM EDGE AS NECESSARY.

□	LABEL	LOCATION	□	LABEL	LOCATION
1	SG 1	S COLUMN	24	SG 24	N COLUMN
2	SG 2	S COLUMN	25	SG 25	N COLUMN
3	SG 3	S COLUMN	26	SG 26	N COLUMN
4	SG 4	S COLUMN	27	SG 27	N COLUMN
5	SG 5	S COLUMN	28	SG 28	N COLUMN
6	SG 6	S COLUMN	29	SG 29	N COLUMN
7	SG 7	S COLUMN	30	SG 30	N COLUMN
8	SG 8	S COLUMN	31	SG 31	N COLUMN
9	SG 9	S TOP BEAM	32	SG 32	N TOP BEAM
10	SG 10	S TOP BEAM	33	SG 33	N TOP BEAM
11	SG 11	S TOP BEAM*	34	SG 34	N TOP BEAM*
12	SG 12	S TOP BEAM*	35	SG 35	N TOP BEAM*
13	SG 13	S TOP BEAM*	36	SG 36	N TOP BEAM*
14	SG 14	S TOP BEAM*	37	SG 37	N TOP BEAM*
15	SG 15	S TOP SLAB	38	SG 38	N TOP SLAB
16	SG 16	S TOP SLAB	39	SG 39	N TOP SLAB
17	SG 17	S TOP SLAB	40	SG 40	N TOP SLAB
18	SG 18	S COL BOT 0°	41	SG 41	N COL BOT 0°
19	SG 19	S COL BOT 45°	42	SG 42	N COL BOT 45°
20	SG 20	S COL BOT 90°	43	SG 43	N COL BOT 90°
21	SG 21	S COL TOP 0°	44	SG 44	N COL TOP 0°
22	SG 22	S COL TOP 45°	45	SG 45	N COL TOP 45°
23	SG 23	S COL TOP 90°	46	SG 46	N COL TOP 90°
47	SG 47	S BOT BRACE	64	SG 64	N BOT BRACE
48	SG 48	S BOT BRACE	65	SG 65	N BOT BRACE
49	SG 49	S BOT BRACE	66	SG 66	N BOT BRACE
50	SG 50	S BOT BRACE	67	SG 67	N BOT BRACE
51	SG 51	S BOT BEAM	68	SG 68	N BOT BEAM
52	SG 52	S BOT BEAM	69	SG 69	N BOT BEAM
53	SG 53	S BOT BEAM*	70	SG 70	N BOT BEAM*
54	SG 54	S BOT BEAM*	71	SG 71	N BOT BEAM*
55	SG 55	S BOT BEAM*	72	SG 72	N BOT BEAM*
56	SG 56	S BOT BEAM*	73	SG 73	N BOT BEAM*
57	SG 57	S TOP BRACE	74	SG 74	N TOP BRACE
58	SG 58	S TOP BRACE	75	SG 75	N TOP BRACE
59	SG 59	S TOP BRACE	76	SG 76	N TOP BRACE
60	SG 60	S TOP BRACE	77	SG 77	N TOP BRACE
61	SG 61	S BOT SLAB	78	SG 78	N BOT SLAB
62	SG 62	S BOT SLAB	79	SG 79	N BOT SLAB
63	SG 63	S BOT SLAB	80	SG 80	N BOT SLAB

\* LOCATE STRAIN GAUGE AT UNDERSIDE OF BEAM FLANGE

STRAIN GAUGE LAYOUT  
 SCALE: 1mm = 50mm

<b>NCBF-INV-3 NON-SEISMIC CBF WITH WIDE FLANGE BRACES</b>	
NEESR NCREE BRACED FRAME TEST	
DRAWN BY: ADS DESIGNED BY: ADS DATE: 8/23/2013 CONTACT: ADSEN@UW.EDU	DWG: <b>IN-1</b>

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KEY

- POTENTIOMETER PERPENDICULAR TO PLANE
- ➔ POTENTIOMETER IN DIRECTION OF ARROW
- TILTMETER (T)
- NDI OPTOTRAK LED TARGET (N)

ABBREVIATIONS

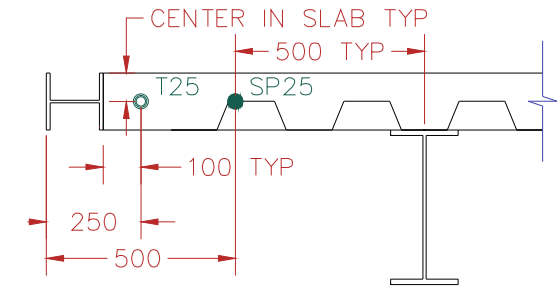
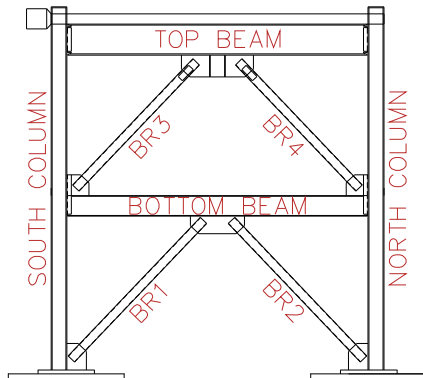
- N NORTH
- S SOUTH
- E EAST
- W WEST
- BOT BOTTOM
- MID MIDDLE
- COL COLUMN
- BR BRACE
- PL PLATE
- OOP OUT OF PLANE
- IP IN PLANE
- DIAG DIAGONAL
- DISP DISPLACEMENT
- ROT ROTATION
- PT POINT
- WP WORK POINT

TILTMETER DESIGNATIONS

●	DESCRIPTION	RANGE +/-
T1	S COL BASE ROT	5°
T2	S COL BASE ROT	10°
T3	S COL FLANGE AT BOT BEAM	10°
T4	S COL MID ROT	10°
T5	S COL MID ROT	10°
T6	TOP BEAM ROT MID S SIDE	3°
T7	TOP BEAM ROT MID S SIDE	3°
T8	BOT BEAM ROT S SIDE	5°
T9	BOT BEAM ROT S SIDE	10°
T10	BOT BEAM ROT MID S SIDE	14.5°
T11	BOT BEAM ROT MID S SIDE	10°
T12	BOT SLAB ROT S SIDE E	5°
T13	BOT SLAB ROT S SIDE W	5°
T14	N COL BASE ROT	5°
T15	N COL BASE ROT	10°
T16	N COL FLANGE AT BOT BEAM	10°
T17	N COL MID ROT	10°
T18	N COL MID ROT	10°
T19	TOP BEAM ROT MID N SIDE	3°
T20	TOP BEAM ROT MID N SIDE	3°
T21	BOT BEAM ROT N SIDE	5°
T22	BOT BEAM ROT N SIDE	10°
T23	BOT BEAM ROT MID N SIDE	14.5°
T24	BOT BEAM ROT MID N SIDE	10°
T25	BOT SLAB ROT N SIDE E	5°
T26	BOT SLAB ROT N SIDE W	5°
T27	BOT SLAB ROT MID E	10°
T28	BOT SLAB ROT MID W	10°
T29	TOP SLAB ROT N SIDE E	5°
T30	TOP SLAB ROT N SIDE W	5°
T31	BOT BEAM TORSIONAL ROT	5°

NDI OPTOTRAK LED DESIGNATIONS

●	DESCRIPTION	●	DESCRIPTION
N1	BR1 OOP QUARTER PT	N25	BR2 OOP QUARTER PT
N2	BR1 OOP QUARTER PT	N26	BR2 OOP QUARTER PT
N3	BR1 OOP	N27	BR2 OOP
N4	BR1 OOP	N28	BR2 OOP
N5	BR1 OOP	N29	BR2 OOP
N6	BR1 OOP	N30	BR2 OOP
N7	BR1 OOP	N31	BR2 OOP
N8	BR1 OOP	N32	BR2 OOP
N9	BOT BEAM MID GP GRID	N33	BOT BEAM MID GP GRID
N10	BOT BEAM MID GP GRID	N34	BOT BEAM MID GP GRID
N11	BOT BEAM MID GP GRID	N35	BOT BEAM MID GP GRID
N12	BOT BEAM MID GP GRID	N36	BOT BEAM MID WEB GRID
N13	BOT BEAM MID GP GRID	N37	BOT BEAM MID WEB GRID
N14	BOT BEAM MID GP GRID	N38	BOT BEAM MID WEB GRID
N15	BOT BEAM MID WEB GRID	N39	BOT BEAM MID WEB GRID
N16	BOT BEAM MID WEB GRID	N40	BOT BEAM MID WEB GRID
N17	BOT BEAM MID WEB GRID	N41	BOT BEAM MID WEB GRID
N18	BOT BEAM MID WEB GRID	N42	BOT BEAM MID WEB GRID
N19	BOT BEAM MID WEB GRID	N43	BOT BEAM MID WEB GRID
N20	BOT BEAM MID WEB GRID	N44	BOT BEAM MID WEB GRID
N21	BOT BEAM MID WEB GRID	N45	BOT BEAM MID WEB GRID
N22	BOT BEAM MID WEB GRID	N46	BOT BEAM MID WEB GRID
N23	BOT BEAM MID WEB GRID	N47	BOT BEAM MID WEB GRID
N24	BOT BEAM MID WEB GRID	N48	BOT BEAM MID WEB GRID



TYPICAL SLAB END INSTRUMENTATION DETAIL NOTE: LOCATE INCLINOMETERS ON OUTSIDE EDGE OF EACH SLAB

<b>NCBF-INV-3 NON-SEISMIC CBF WITH WIDE FLANGE BRACES</b>	
NEESR NCREE BRACED FRAME TEST	
DWG:	
IN-2	
DRAWN BY: ADS DESIGNED BY: ADS DATE: 8/23/2013 CONTACT: ADSEN@UW.EDU	

POTENTIOMETER DESIGNATIONS

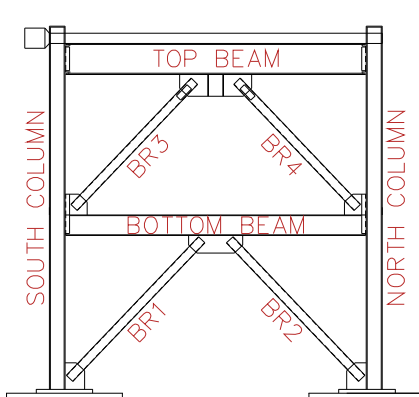
ABBREVIATIONS

- N NORTH
- S SOUTH
- E EAST
- W WEST
- BOT BOTTOM
- MID MIDDLE
- COL COLUMN
- BR BRACE
- PL PLATE
- OOP OUT OF PLANE
- IP IN PLANE
- DIAG DIAGONAL
- DISP DISPLACEMENT
- ROT ROTATION
- PT POINT
- WP WORK POINT

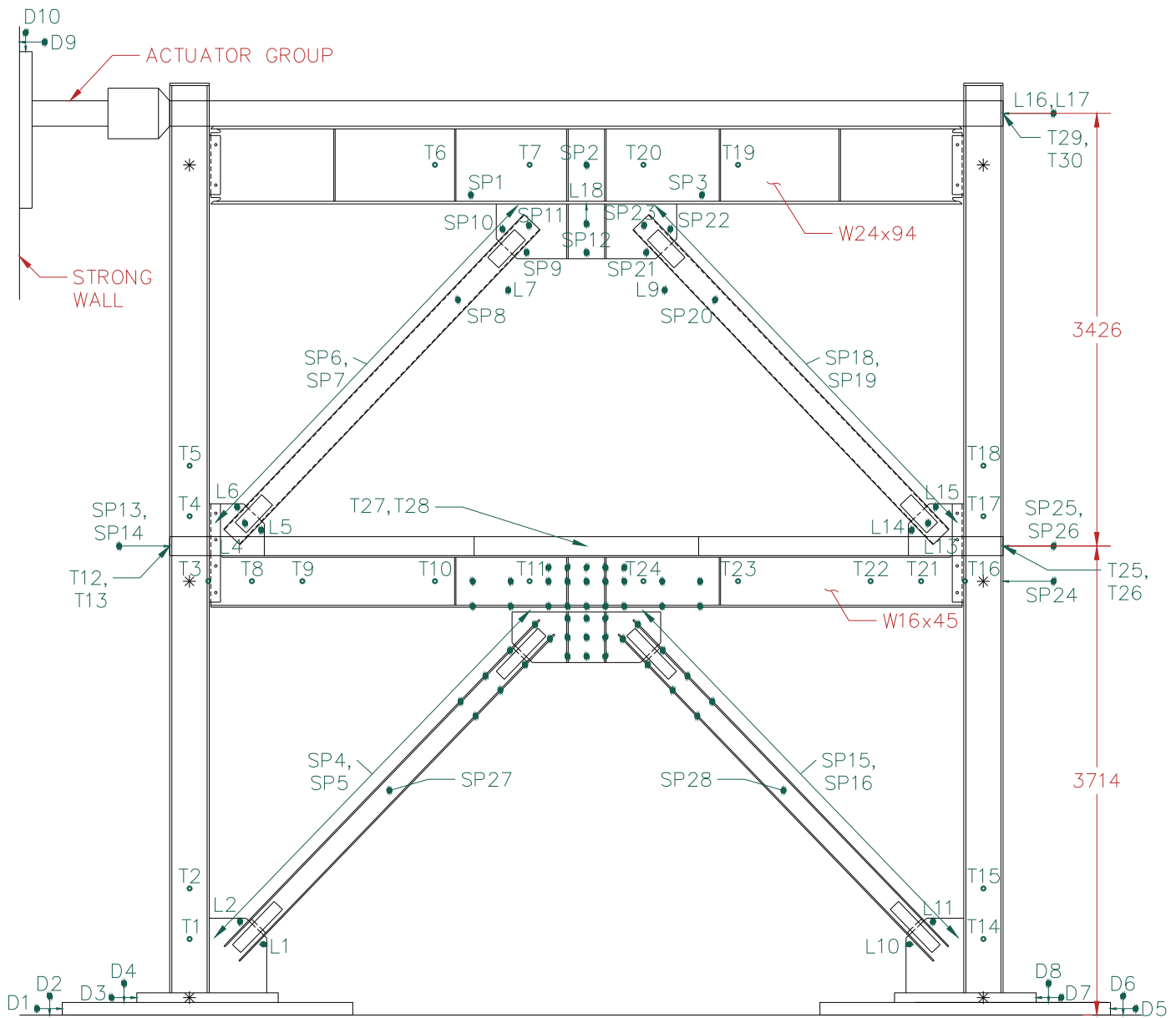
●	DESCRIPTION	TYPE	RANGE +/-	FREEDOM
L1	S BASE GP OOP BOT	TML	100mm	
L2	S BASE GP OOP TOP	TML	100mm	
L4	S MID GP OOP CENTER	TML	50mm	HORIZ
L5	S MID GP OOP N EDGE	TML	100mm	HORIZ
L6	S MID GP OOP TOP EDGE	TML	100mm	HORIZ
L7	ALUMINUM PL OOP S	TML	25mm	
L9	ALUMINUM PL OOP N	TML	25mm	
L10	N BASE GP OOP BOT	TML	50mm	
L11	N BSAE GP OOP TOP	TML	100mm	
L13	N MID GP OOP CENTER	TML	50mm	HORIZ
L14	N MID GP OOP S EDGE	TML	100mm	HORIZ
L15	N MID GP OOP TOP EDGE	TML	100mm	HORIZ
L16	TOP BEAM DRIFT E SIDE	TEMPO	250mm	
L17	TOP BEAM DRIFT W SIDE	TEMPO	250mm	
L18	TOP BEAM VERT DISP	TML	150mm	HORIZ
L19	BOT BEAM VERT DISP	TML	150mm	HORIZ

●	DESCRIPTION	TYPE	RANGE +/-	FREEDOM
SP1	TOP BEAM S OOP ROT	STRING	125mm	HORIZ
SP2	TOP BEAM MID OOP	STRING	125mm	HORIZ
SP3	TOP BEAM N OOP ROT	STRING	125mm	HORIZ
SP4	S BOT BRACE DIAG/OOP	STRING	250mm	HORIZ
SP5	S BOT BRACE DIAG/OOP	STRING	250mm	HORIZ
SP6	S TOP BRACE DIAG/OOP	STRING	250mm	HORIZ
SP7	S TOP BRACE DIAG/OOP	STRING	250mm	HORIZ
SP8	S TOP BRACE QUARTER PT	STRING	250mm	HORIZ
SP9	S TOP GP OOP BOT EDGE	STRING	125mm	HORIZ
SP10	S TOP GP OOP S EDGE	STRING	125mm	HORIZ
SP11	S TOP GP OOP CENTER	STRING	125mm	HORIZ
SP12	MID TOP GP OOP	STRING	125mm	HORIZ
SP13	S BOT BEAM DRIFT E SIDE	STRING	250mm	
SP14	S BOT BEAM DRIFT W SIDE	STRING	250mm	
SP15	N BOT BRACE DIAG/IP	STRING	250mm	HORIZ
SP16	N BOT BRACE DIAG/IP	STRING	250mm	HORIZ
SP18	N TOP BRACE DIAG/OOP	STRING	250mm	HORIZ
SP19	N TOP BRACE DIAG/OOP	STRING	250mm	HORIZ
SP20	N TOP BRACE QUARTER PT	STRING	250mm	HORIZ
SP21	N TOP GP OOP BOT EDGE	STRING	125mm	HORIZ
SP22	N TOP GP OOP N EDGE	STRING	125mm	HORIZ
SP23	N TOP GP OOP CENTER	STRING	125mm	HORIZ
SP24	N BOT BEAM DRIFT WP	STRING	250mm	
SP25	N BOT BEAM DRIFT E SIDE	STRING	250mm	
SP26	N BOT BEAM DRIFT W SIDE	STRING	250mm	
SP27	S BOT BRACE OOP	STRING	125mm	
SP28	N BOT BRACE OOP	STRING	250mm	

●	DESCRIPTION	TYPE	RANGE +/-	FREEDOM
D1	S ANCHOR PL SLIP	DIAL	25mm	
D2	S ANCHOR PL UPLIFT	DIAL	25mm	
D3	S BASE PL SLIP	DIAL	25mm	
D4	S BASE PL UPLIFT	DIAL	25mm	
D5	N ANCHOR PL SLIP	DIAL	25mm	
D6	N ANCHOR PL UPLIFT	DIAL	25mm	
D7	N BASE PL SLIP	DIAL	25mm	
D8	N BASE PL UPLIFT	DIAL	25mm	
D9	ACTUATOR BASE PL UPLIFT	DIAL	25mm	
D10	ACTUATOR BASE PL SLIP	DIAL	25mm	

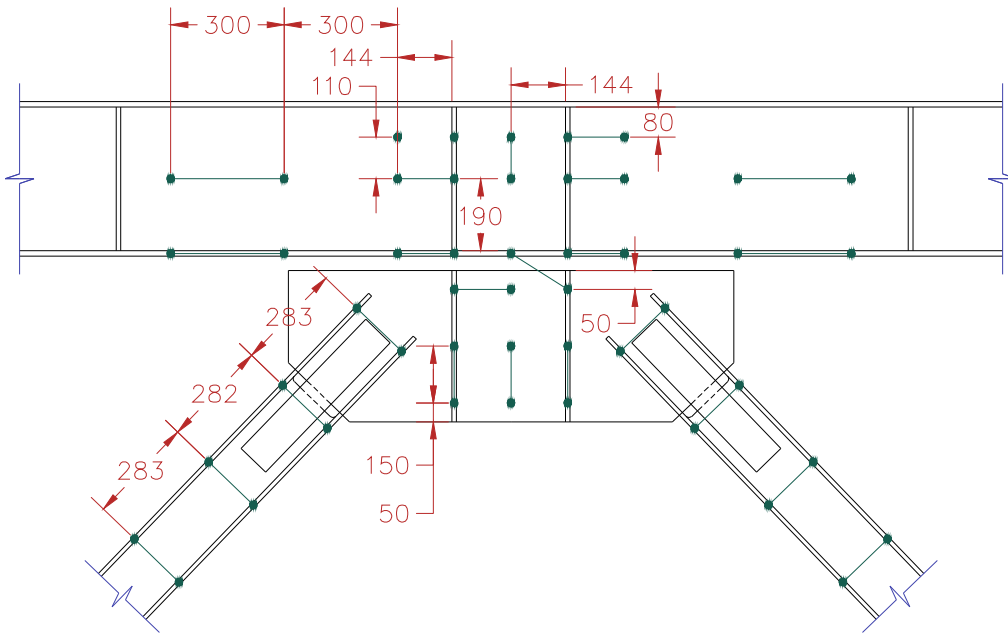


<b>NCBF-INV-3 NON-SEISMIC CBF WITH WIDE FLANGE BRACES</b>	
NEESR NCREE BRACED FRAME TEST	
DRAWN BY: ADS DESIGNED BY: ADS DATE: 8/23/2013 CONTACT: ADSEN@UW.EDU	DWG: <span style="font-size: 2em; font-weight: bold;">IN-3</span>

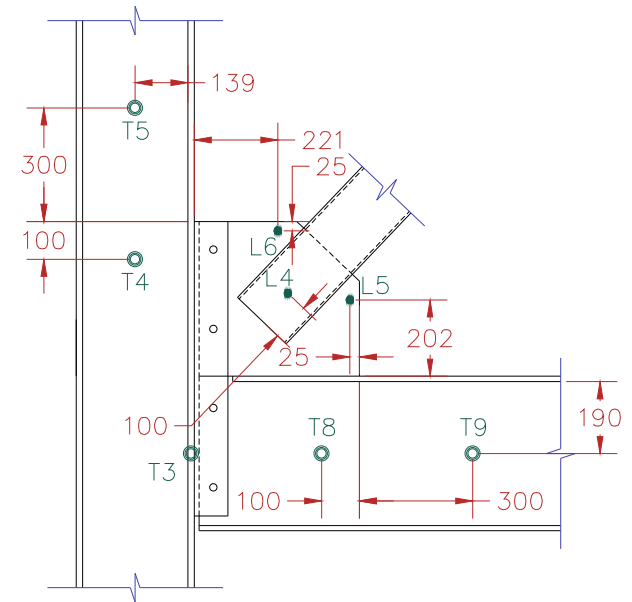


SCALE: 1mm = 50mm

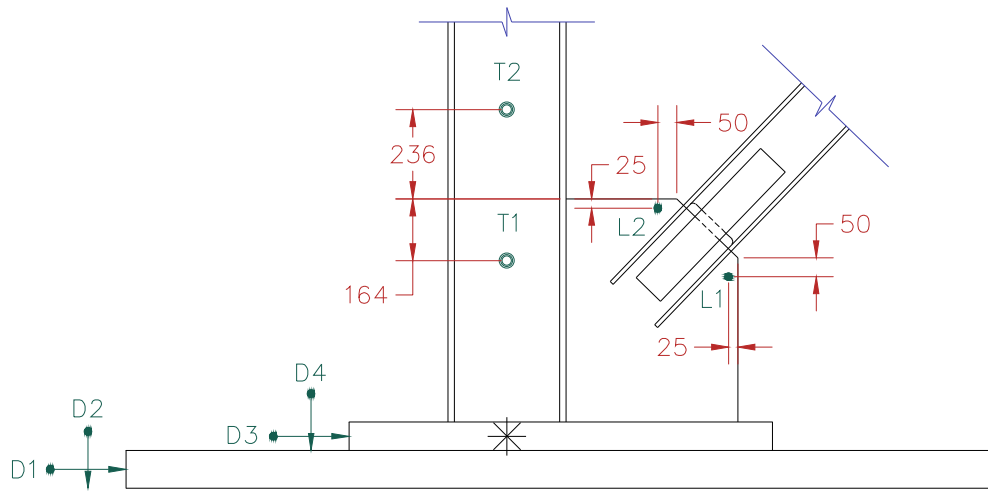
<b>NCBF-INV-3 NON-SEISMIC CBF WITH WIDE FLANGE BRACES</b>	
NEESR NCREE BRACED FRAME TEST	
DRAWN BY: ADS DESIGNED BY: ADS DATE: 8/23/2013 CONTACT: ADSEN@UW.EDU	DWG: <b>IN-4</b>



BOTTOM BEAM GUSSET PLATE LED LOCATION DETAIL

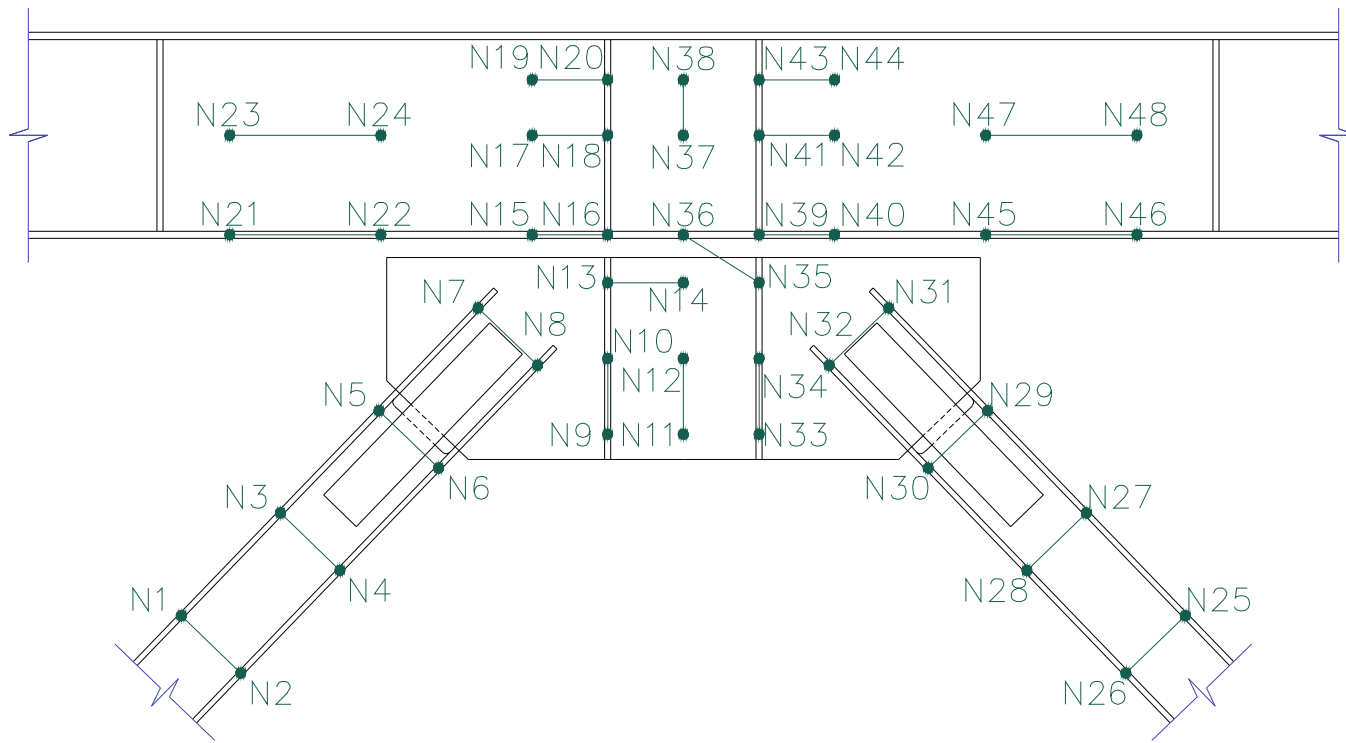


TYPICAL BEAM/COLUMN GUSSET PLATE INSTRUMENTATION DETAIL



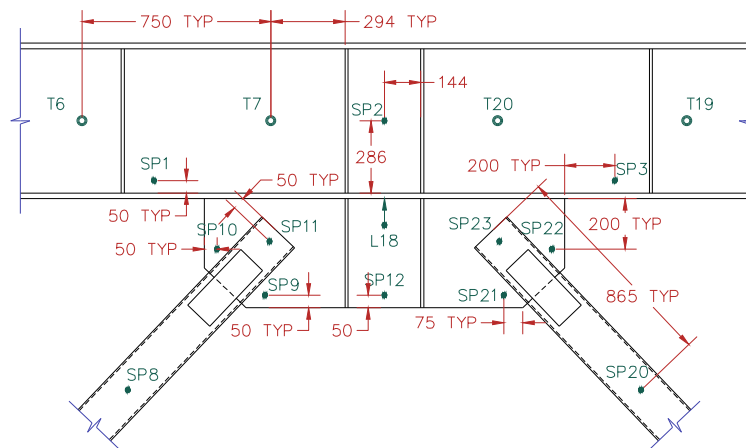
TYPICAL BASE GUSSET PLATE INSTRUMENTATION DETAIL

<b>NCBF-INV-3 - NON-SEISMIC CBF WITH WIDE FLANGE BRACES</b>	
NEESR NCREE BRACED FRAME TEST	
DRAWN BY: ADS DESIGNED BY: ADS DATE: 8/23/2013 CONTACT: ADSEN@UW.EDU	
DWG:	<b>IN-5</b>

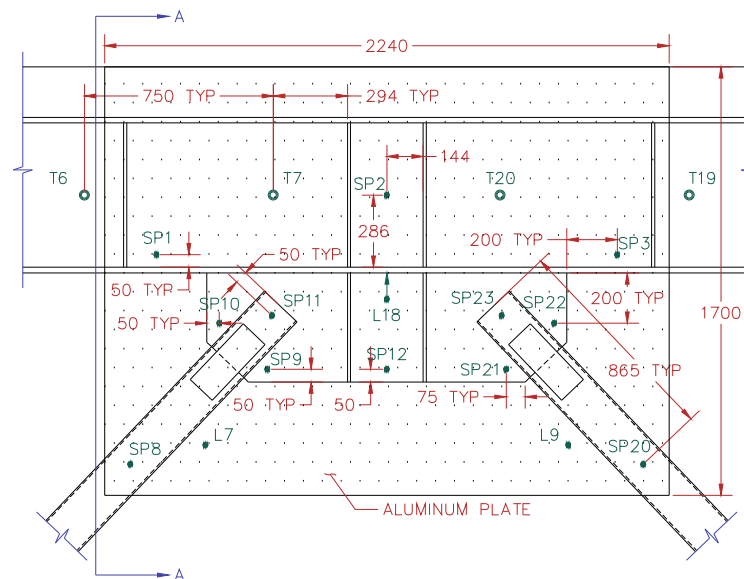
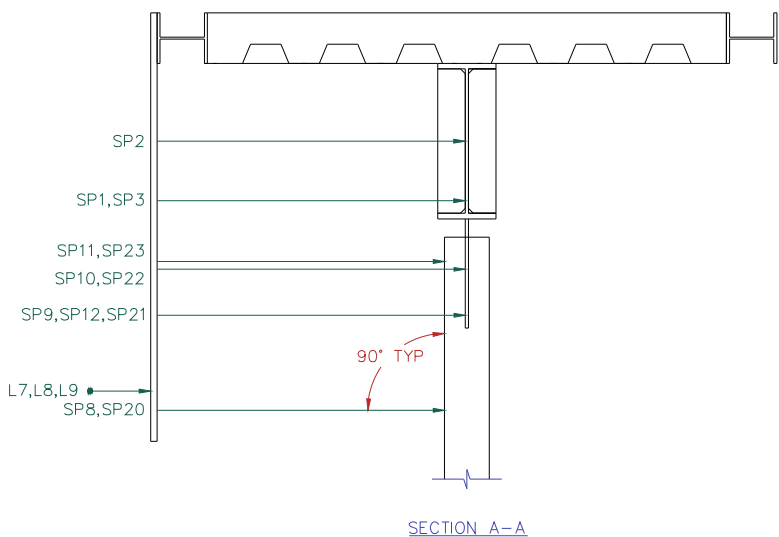


BOTTOM BEAM GUSSET PLATE LED NUMBERING

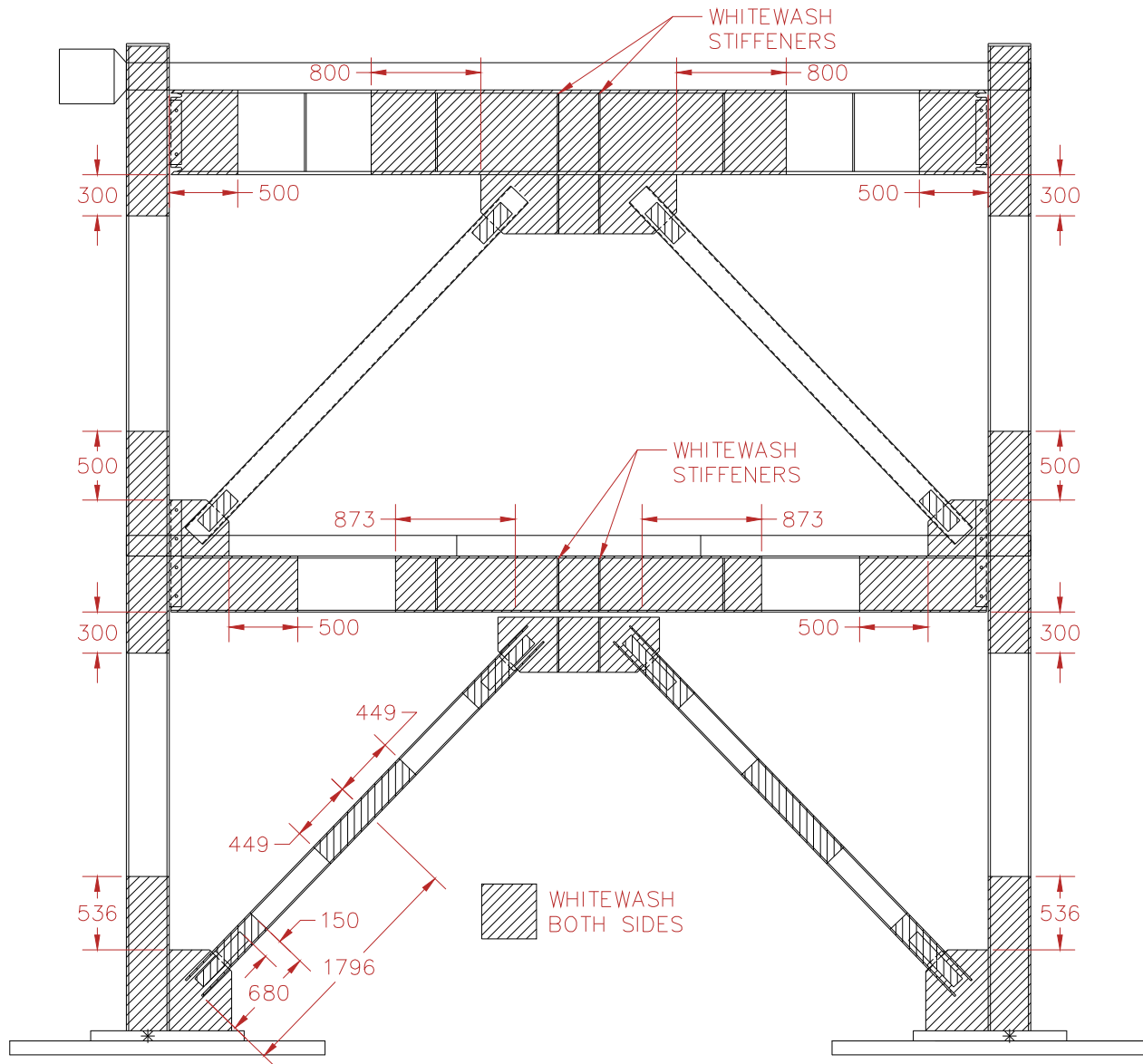
<b>NCBF-INV-3 - NON-SEISMIC CBF WITH WIDE FLANGE BRACES</b>	
NEESR NCREE BRACED FRAME TEST	
DRAWN BY: ADS DESIGNED BY: ADS DATE: 8/23/2013 CONTACT: ADSEN@UW.EDU	
DWG:	<b>IN-5</b>



TOP BEAM GUSSET PLATE  
INSTRUMENTATION DETAIL



<b>NCBF-INV-3 - NON-SEISMIC CBF WITH WIDE FLANGE BRACES</b>	
NEESR NCREE BRACED FRAME TEST	DWG:
DRAWN BY: ADS DESIGNED BY: ADS DATE: 8/23/2013 CONTACT: ADSEN@UW.EDU	<b>IN-7</b>



WHITEWASH PLAN  
SCALE: 1mm = 50mm

**NCBF-INV-3 - NON-SEISMIC CBF WITH WIDE FLANGE BRACES**

NEESR NCREE BRACED FRAME TEST

DWG:

DRAWN BY: ADS  
DESIGNED BY: ADS  
DATE: 8/22/2013  
CONTACT: ADSEN@UW.EDU

**IN-8**