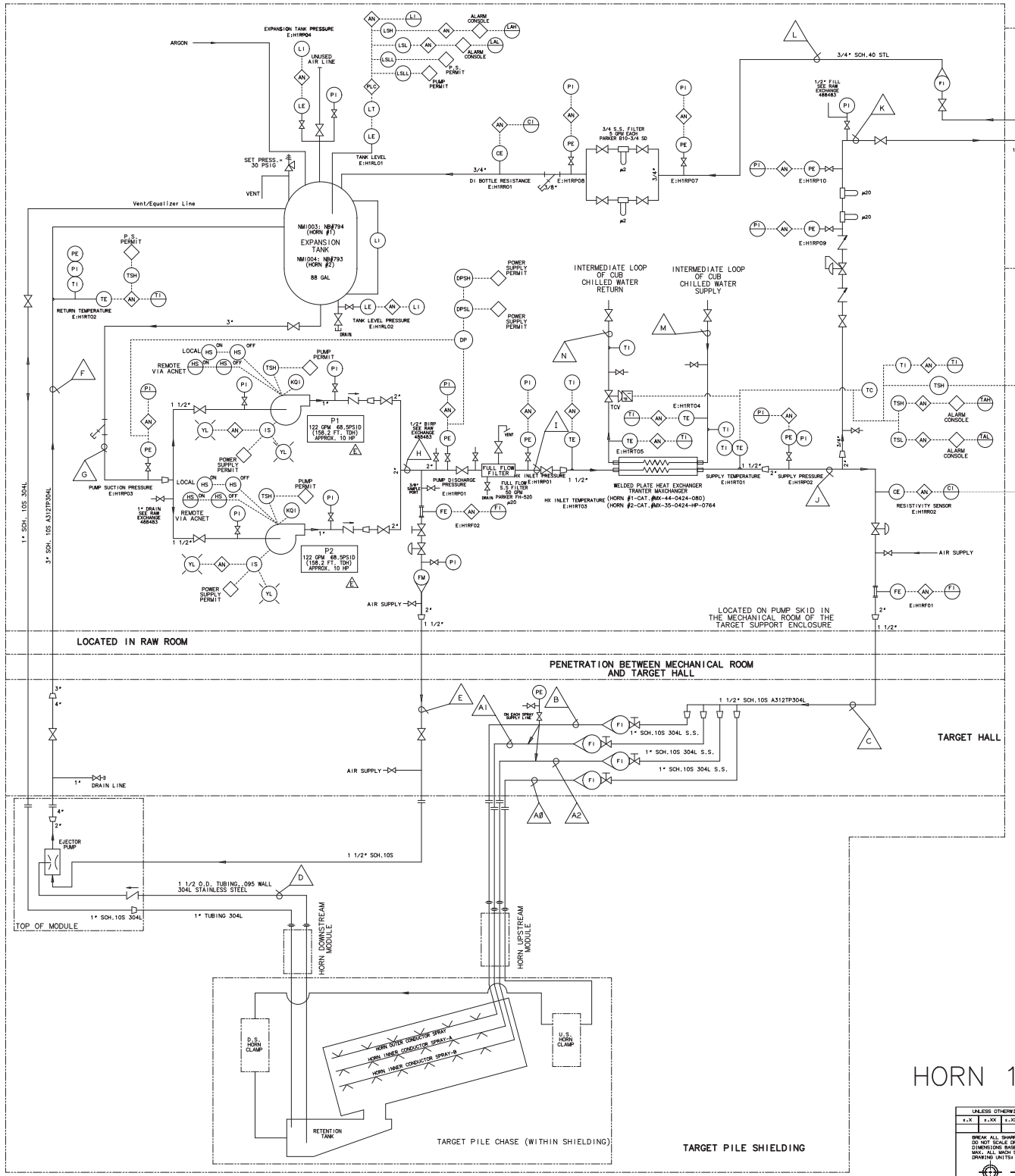
DESCRIPTION: NUMI HORN 1 AND 2 PID
CATEGORY: PROJECT: NUMI/LBNE

REV	REVISION CONTROL DOCUMENT	DATES		SIGNATURES	
E	F00406477-E-RCD	08-Nov-2017	DRAWN	D.HURD	
			APPROVED	D.HURD	
A	EQUIPMENT INFO ADDED FLOWS NOT UPDATED		R.L.SMITH		4/07/04
			R.SILVA		4/14/04
B	CHG'D SET PRESS OF RELIEF VALVE ON EXPANSION TANK FROM 70* W.C. TO 30 PSIG		D.FRIEND		18-AUG-2004
			R.SILVA		18-AUG-2004
C	UPDATED P&ID INFO LOCATED ON HORN SKIDS IN MECHANICAL ROOM TO AS FOUND 10-MAR-2011. PERFORMANCE VALUES CALCULATED FOR ORIGINAL DESIGN AND HAVE NOT BEEN UPDATED.		DGH		11-MAR-2011
			S.REEVES		21-SEP-2011
D	UPDATED TO AS-BUILT FOR 2012 NOVA UPGRADE SHUTDOWN		D.HURD		25-OCT-2011
			K.WILLIAMS		01-AUG-2013



HORN 1 SKID:

POINT	FLOW GPM	TEMP °F	PRESSURE PSIG	DESCRIPTION
A0	1	65	1	CLAMP COOLING
A1	12.5	65	23	INNER CONDUCTOR SPRAY A
A2	11.2	65	24	INNER CONDUCTOR SPRAY B
B	11.4	65	16	OUTER CONDUCTOR SPRAY
C	36.1	65	30	SUPPLY TO TARGET HALL
D	36.1	70	-5	JET PUMP SUCTION
E	80	70	68.5	JET PUMP MOTIVE (SUPPLY)
F	122	70	0	JET PUMP OUTLET
G	122	70	0	PUMP SUCTION
H	122	71	68.5	PUMP DISCHARGE
I	42.1	71	68.5	FILTER OUTLET/Hx SUPPLY
J	42.1	65	68.5	Hx OUTLET/SUPPLY
K	6	65	20	DI BOTTLE SUPPLY
L	6	65	5	DI BOTTLE RETURN
M	60	59	85	INTERMEDIATE LOOP SUPPLY
N	60	62	80	INTERMEDIATE LOOP RETURN

PUMP DATA:
EMBARA
MODEL: A3U-40-160-1100T3C

MOTOR:
MARATHON ELECTRIC
MODEL: BVH 215TTFW7303AB L.
FR-215JM PH:3. 60 Hz. 10 HP. 3465 RPM. 208-230/460 V.

EJECTOR:
JOHN C. ERNST MODEL LH-2
P/N 56649-030
316 SS MAT'L
1 1/2" x 2 x 2 SIZE

NOTES:

1. HORN #1 ANTICIPATED HEAT LOAD=30 KW
   HORN #1 DESIGN HEAT LOAD =150 KW

HORN 1 P&ID

UNLESS OTHERWISE SPECIFIED: x.X ±.XX ±.XXX ±X/X ±X°

BREAK ALL SHARP EDGES MAX.
DO NOT SCALE DRAWING
DIMENSIONS BASED ON MAX. ALL MACH SURFACES
DRAWING UNITS: INCHES

DRAWN	N.CADENA	DATE
CHECKED	D.FRIEND	DATE
APPROVED	D.PUSHKA	DATE
USED ON		
MATERIAL		
GROUP: Accelerator Mechanical Support	CAGE CODE:	

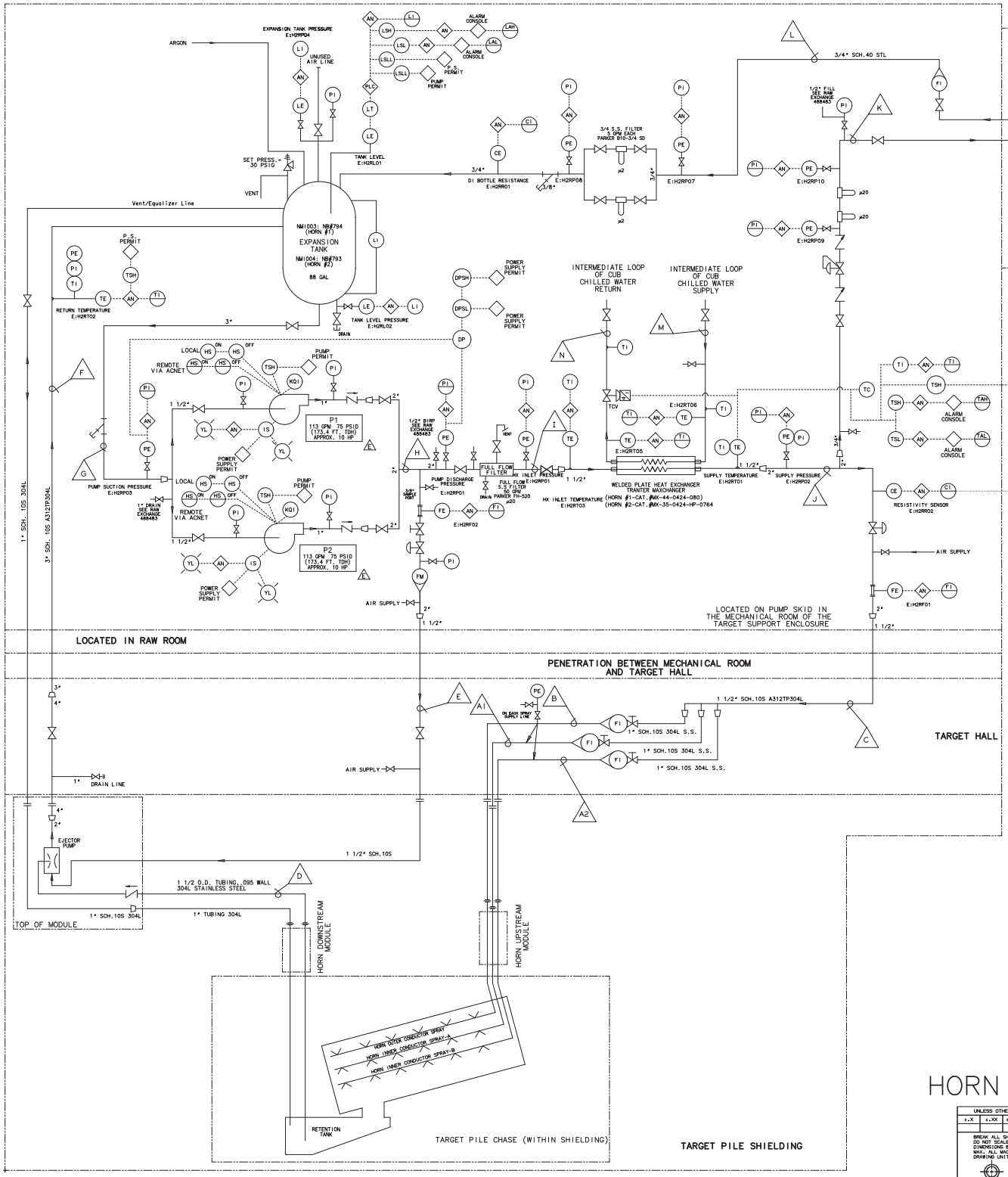
FERMI NATIONAL ACCELERATOR LABORATORY
UNITED STATES DEPARTMENT OF ENERGY

NAME: NUMI HORN 1 AND 2 PID

SCALE	SIZE	DRAWING NUMBER	SHEET	REV
	E	F00406477	1 OF 2	E

DESCRIPTION: NUMI HORN 1 AND 2 PID
CATEGORY: PROJECT: NUMI/LV-11item

REV	REVISION CONTROL DOCUMENT	DATES	SIGNATURES	
E	F00406477-E-RCD	08-Nov-2017	DRAWN	D.HURD
			APPROVED	D.HURD
A	EQUIPMENT INFO ADDED FLOWS NOT UPDATED		R.L.SMITH	4/07/04
			R.SILVA	4/14/04
B	CHG'D SET PRESS OF RELIEF VALVE ON EXPANSION TANK FROM 70* W.C. TO 30 PSIG		D.FRIEND	18-AUG-2004
			R.SILVA	18-AUG-2004
C	UPDATED P&ID INFO LOCATED ON HORN SKIDS IN MECHANICAL ROOM TO AS FOUND 10-MAR-2011. PERFORMANCE VALUES CALCULATED FOR ORIGINAL DESIGN AND HAVE NOT BEEN UPDATED.		DGH	11-MAR-2011
			S.REEVES	21-SEP-2011
D	UPDATED TO AS-BUILT FOR 2012 NOVA UPGRADE SHUTDOWN		D.HURD	25-OCT-2011
			K.WILLIAMS	01-AUG-2013



E HORN 2 SKID:

POINT	FLOW GPM	TEMP °F	PRESSURE PSIG	DESCRIPTION
A1	10.5	65	24	INNER CONDUCTOR SPRAY A
A2	10	65	20	INNER CONDUCTOR SPRAY B
B	6.5	65	12	OUTER CONDUCTOR SPRAY
C	27	65	35	SUPPLY TO TARGET HALL
D	27	68	~5	JET PUMP SUCTION
E	80	68	65	JET PUMP MOTIVE (SUPPLY)
F	113	68	0	JET PUMP OUTLET
G	113	68	0	PUMP SUCTION
H	113	69	75.1	PUMP DISCHARGE
I	33	69	67.7	FILTER OUTLET/Hx SUPPLY
J	33	65	67.7	Hx OUTLET/SUPPLY
K	6	65	20	DI BOTTLE SUPPLY
L	6	65	2	DI BOTTLE RETURN
M	60	60	85	INTERMEDIATE LOOP SUPPLY
N	60	62	80	INTERMEDIATE LOOP RETURN

E PUMP DATA:
EMBARA
MODEL: A3U-40-160-1100T3C

E MOTOR:
MARATHON ELECTRIC
MODEL: BVH 215TTFW7303AB L.
FR-215JM PH:3. 60 Hz. 10 HP. 3465 RPM. 208-230/460 V.

EJECTOR:
JOHN C. ERNST MODEL LH-2
P/N 56849-030
316 SS MAT'L
1 1/2" x 2 x 2 SIZE

NOTES:

1. HORN #2 ANTICIPATED HEAT LOAD=10 KW
   HORN #2 DESIGN HEAT LOAD =50 KW

HORN 2 P&ID

UNLESS OTHERWISE SPECIFIED				
±.X	±.XX	±.XXX	±X/X	±X°
				°

BREAK ALL SHARP EDGES MAX.
DO NOT SCALE DRAWING
DIMENSIONS BASED ON MAX. ALL MACH SURFACES
DRAWING UNITS: INCHES

DRAWN	N.CADENA	DATE
CHECKED	D.FRIEND	DATE
APPROVED	D.PUSHKA	DATE

USED ON
MATERIAL
GROUP: Accelerator Mechanical Support
CAGE CODE:

FERMI NATIONAL ACCELERATOR LABORATORY
UNITED STATES DEPARTMENT OF ENERGY

NAME: NUMI HORN 1 AND 2 PID

SCALE	SIZE	DRAWING NUMBER	SHEET	REV
	E	F00406477	2 of 2	E