



7

PWS ANCHOR RODS VOLUME I

(2011) – 274 Rods

Fabrication Process

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PWS ANCHOR ROD TIMELINE

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ADDITIONAL DOCUMENTS

- ASTM A123
- ASTM A143
- ASTM A153
- ASTM A354
- ASTM A490
- ASTM A788
- ASTM F1470
- ASME B1.13M

Location and Item	Component Description	Rod (no head) or Bolt (with head)	Threads Cut or Rolled	Supplier	Diameter (in)	Overall Length (ft)	Overall Length (mm)	Quantity Installed (not including spares)	De-Humidified Zone?	Tighten Method	Final Tension (fraction of Fu or UTS)	Date Tension or Loading Complete	Date Re-Inspected (by 4/8/13)	Date Re-Inspected (by 4/23/13)	Date Re-Inspected (by 5/5/13)	Notes		
E2 Bearings and Shear Keys	1	E2 Shear Key - Connect to Concrete - Above Column, Under OBG [S1, S2]	rod	Cut	Dyson	3	17.2 10.0	5235 3035	60 36	96	No	Tension	0.7	3/5/2013	daily check	daily check	daily check	Tensioned to 0.75 Fy, with lockoff at ~ 0.7 Fu 32 of 96 rods broke after tensioning, then tension level lowered
	2	E2 Shear Key - Connect to Concrete - Above Bent Cap, Under Crossbeam [S3, S4]	rod	Cut	Dyson	3	21.9	6676	96									192
	3	E2 Bearing - Connect to Concrete - Under OBG [B1, B2, B3, B4]	rod	Cut	Dyson	3	22.6 22.2	6902 6777	64 32	320	No	Tension	0.7	4/9/2013	daily check	daily check	daily check	
		E2 Shear Key - Connect to OBG [S1, S2]	rod	Cut	Dyson	3	4.4 1.8	1337 537	96 64									320
	E2 Shear Key - Connect to Crossbeam [S3, S4]	rod	Cut	Dyson	3	4.3 1.7	1312 512	96 64	224	No	Tension	0.7	9/12/2012	4/6/2013	4/17/13 to 4/23/13	5/3/2013	Tensioned to 0.75 Fy, with lockoff at ~ 0.7 Fu	
	4	E2 Bearing - Connect to OBG [B1, B2, B3, B4]	rod	Cut	Dyson	2	3.6	1105									224	No
	5	E2 Bearing Assembly Bolts (Spherical Bushing Halves)	rod	Cut	Dyson for Lubrite for Hochang	1	2.4	733	96	No	Tension	0.61	July 2009	not accessible	not accessible	not accessible	Connect 2 halves of the spherical bushing assembly housing together at Lubrite; rods are internal to bearings and all rods are not accessible after bearing assembly at Hochang (December 2009 & January 2010); rods tensioned to 0.7 Fy.	
6	E2 Bearing Assembly Bolts (Retaining Rings)	Socket Head Cap Screw	Cut	Dyson for Hochang	1	0.2	55	336	No	snug + 1/4 turn	-0.4	January 2010	4/6/2013 (for 32 accessible bolts)	4/23/2013 (for 32 accessible bolts)	5/3/2013 (for 32 accessible bolts)	Bolts thread into drill and tap holes to attach retaining rings that secure the Lubrite spherical bushing assembly in the bottom housing; bolts are mechanically galvanized, not hot dip galvanized; bolts are internal to bearings and not accessible after bearing assembly at Hochang, except for a small number of bolts in limited areas -> 32 of 336 bolts are accessible.		
Cable Anchorage	7	PWS Anchor Rods - PWS Socket to Anchorage	rod	55 Cut (20%) 219 Rolled (80%)	Dyson	3-1/2	27.9 to 31.8	8500 to 9700	274	Yes	Load Transfer	0.26	9/26/2012	4/6/2013	4/20&22/2013	5/4/2013	With DL after load transfer (current condition)	
												0.29	N/A	N/A	N/A	N/A	With DL + Added DL	
												0.32	N/A	N/A	N/A	N/A	Service Load (Group 1)	
												0.35	N/A	N/A	N/A	N/A	SEE (Seismic)	
Top of Tower	8	Tower Saddle Tie Rods	rod	Rolled	Dyson	4	6.0 to 17.5	1840 to 5325	25	Yes	Tension	0.41 0.68	7/14/2012 N/A	N/A 4/6/2013	N/A 4/19/2013	N/A 5/3/2013	Load During Construction - Tensioned to 0.5 Fy Additional tension in tie rods from cable with service load	
	9	Turned Rods at Tower Saddle Segment Splices	rod	Cut	Dyson	3 @ Threads [-3-1/16 @ Shank]	1.5 1.4	463 415	100 8	108	Yes	Tension	0.45	4/6/2011	4/6/2013	4/19/2013	5/3/2013	Located at the 2 field splices connecting the 3 tower saddle segments; 100 rods tensioned prior to saddle erection; 8 rods only snug tight after tie rod tensioning due to conflict with tie rods.
	snug	-0.1	7/14/2012															
	10	Tower Saddle to Grillage Anchor Bolts	Hex Bolt	Cut	Dyson	3	1.2	360	90	Head Yes, Nut No	snug	-0.1	3/25/2013	4/6/2013	4/19/2013	5/3/2013	Snug tightened before and after load transfer: Initial Tension complete on 5/20/2011; final tension complete on 3/25/2013.	
11	Tower Outrigger Boom (for Maintenance) at Top of Tower	Hex Bolt	Cut	Dyson	3	2.1	630	4	No	snug	-0.1	July 2012	4/6/2013	4/19/2013	5/4/2013	Act as pins for swinging out and then securing the maintenance outrigger boom at the top of 2 of 4 tower head chimneys. At each boom, one bolt is loaded and other bolt is unloaded in the current boom position. The currently unloaded bolt will be installed snug tight when the boom is swung out for use (future position).		
Bottom of Tower	12	Tower Anchor Rods - Tower at Footing (3" Dia)	rod	Cut	Vulcan Threaded Products for KOS for KFM (04-0120E4)	3	25.6	7789	388	Yes	Tension	0.48	4/17/2013	N/A	4/20/2013 4/22/2013	5/5/2013	Tensioned to 1800 kN = 404.7 kips; Tension before and after load transfer: Initial Tension Late 2010 through Early 2011; Final Tension 2013	
	13	Tower Anchor Rods - Tower at Footing (4" Dia)	rod	Cut		4	25.7	7839	36	Yes	Tension	0.37	4/17/2013	N/A	4/20/2013 4/22/2013	5/5/2013	Tensioned to 2530 kN = 568.8 kips; Tension before and after load transfer: Initial Tension Late 2010 through Early 2011; Final Tension 2013	
East Saddles	14	East Saddle Anchor Rods	rod	Cut	Dyson for JSW	2	2.6	800	32	Yes	snug	-0.1	May 2010	4/7/2013	4/21/2013	5/3/2013	specified gap under nut/washer at one end of rod and 2 nuts snug against each other at other end of rod -> snug tight for portion of rod	
	15	East Saddle Tie Rods	Hex Bolt	Cut	Dyson	3	4.7	1420	18	Yes	snug	-0.1 0.2	4/13/2012 N/A	N/A 4/7/2013	N/A 4/21/2013	N/A 5/3/2013	Snug tightened before load transfer Additional tension in tie rods from cable with service load	
East Cable	16	B14 Cable Bands - Cable Brackets - at East End of Bridge - Strongback Anchor Rods	rod	Rolled	Dyson	3	10.3 to 11.1	3129 to 3372	24	No	Tension	0.16	2/8/2013	4/7/2013	4/21/2013	5/4/2013	pre-compress neoprene between strongback and cable band	
W2 Bent Cap	17	W2 Bikepath Anchor Rods	rod	Cut	Dyson	~1-3/16 [Metric M30]	1.5	460	43	No	Not Determined Yet	N/A	N/A	N/A	N/A	Details for bikepath connections are being redesigned and are not final. The 18 anchor rods at the bottom connections will be abandoned. The 25 anchor rods at the top connections will be used and supplemented with additional anchor rods. These rods will be tensioned on the separate YBITS-2 Contract.		

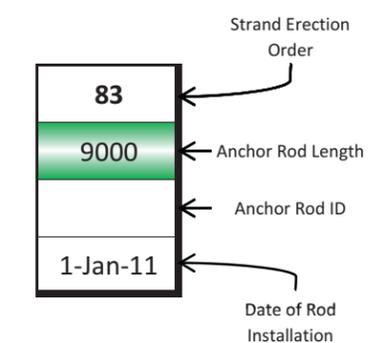
Total = 2306

New information after 5/6/2013 Update is highlighted Red

Load No.	Total Quantity	Release Tag Quantity		METS
		Orange	Blue	
1	44	2	42	released
2	48	19	29	released
3	51	51	0	released
4	sent back	39	16	rejected
5	26	14	12	released
6	26	0	26	released
7	26	0	26	released
8	27	0	27	released
9	24	22	2	released
10	2	2	0	released
TOTAL	274			

14W, North Anchorage (Looking East)

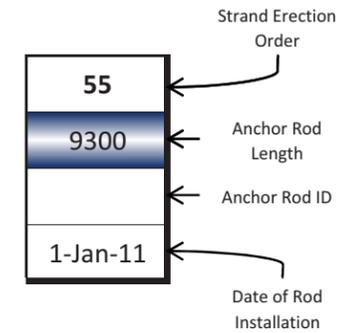
132	136	133	137	128	134	122	129	135	123	130	116	124	108	117	109		
9300	9200	9000	8900	8700	8700	8600	8500	8500	8500	8500	8600	8700	8700	8900	9000		
OYP-3	OYO-9	OYL-4	OYN-7	OQY-26	OQX4-30	OQY-17A	OQY-21C	OQY-32	OYP-2	OYL-3	OYH-6	OQY-28	OQY-25	OYN-4	OYK-5		
27-Oct-11	21-Nov-11	21-Nov-11	21-Nov-11	21-Nov-11	21-Nov-11	18-Oct-11	21-Nov-11	21-Nov-11	?	?	?	?	?	?	?		
125	131	126	120	127	113	121	114	106	115	107	99	91	100	92	83		
9300	9200	8900	8900	8700	8700	8600	8500	8500	8500	8500	8600	8700	8700	8900	9000		
OYM-10	OYH-1	OYN-6	OYG-1	OQY-31	OQY-29	OQY-9A	OQY-13C	OOH2-23	OOH2-2	OOH2-20	OQX3-13	OQX4-13	OQY-19	OYL-5	OPY2-26		
27-Oct-11	26-Oct-11	21-Nov-11	21-Nov-11	?	?	17-Oct-11	?	21-Nov-11	21-Nov-11	21-Nov-11	18-Oct-11	18-Oct-11	?	?	18-Oct-11		
118	111	119	112	104	96	105	97	89	98	90	81	72	82	73	64		
9300	9200	8900	8900	8700	8700	8600	8500	8500	8500	8500	8600	8700	8700	8900	9000		
OYJ-10	OYO-3	OYO-8	OPY4-24	OYN-1	OQX4-23	OQX3-5	OQY-19C	OYG-2	OQY-27	OQY-3C	OQY-1A	OQY-2	OQY-15	OYN-5	OPY2-23		
27-Oct-11	26-Oct-11	21-Nov-11	?	27-Oct-11	17-Oct-11	17-Oct-11	21-Nov-11	21-Nov-11	21-Nov-11	21-Nov-11	18-Oct-11	18-Oct-11	18-Oct-11	?	18-Oct-11		
101	110	102	94	103	95	87	78	88	79	70	80	71	62	53	63	54	
9300	9200	8900	8900	8700	8700	8600	8500	8500	8500	8500	8600	8700	8700	8900	9000	9300	
OYM-7	OYP-5	OYL-6	OYL-9	OYL-8	OQX4-5	OQY-6A	OQY-15C	OQY-18C	OOF2-4	OQY-22C	OQX3-8	OQX4-11	OQX4-24	OYN-3	OPY2-4	OYJ-7	
27-Oct-11	26-Oct-11	21-Nov-11	21-Nov-11	?	17-Oct-11	17-Oct-11	21-Nov-11	?	21-Nov-11	21-Nov-11	18-Oct-11	18-Oct-11	18-Oct-11	?	18-Oct-11	25-Oct-11	
84	93	85	76	86	77	68	59	69	60	51	61	43	52	44	36	45	37
9300	9200	8900	8900	8700	8700	8600	8500	8500	8500	8500	8600	8700	8700	8900	9000	9300	9400
OOH2-7	OYM-1	OYK-4	OYL-7	OQX4-20	OQX4-17	OQY-12A	OQY-23C	OQY-14C	OQY-20C	OPY3-8	OQX3-16	OQX4-12	OQX4-9	OYG-4	OPY2-38	OYN-10	OTD-2E
27-Oct-11	26-Oct-11	?	27-Oct-11	17-Oct-11	17-Oct-11	17-Oct-11	21-Nov-11	?	21-Nov-11	21-Nov-11	18-Oct-11	18-Oct-11	18-Oct-11	?	18-Oct-11	25-Oct-11	?
74	65	75	66	57	67	48	58	49	41	50	42	34	26	35	27	20	28
9300	9200	8900	8900	8700	8700	8600	8500	8500	8500	8500	8600	8700	8700	8900	9000	9300	9400
R1002-OTD	OYJ-5	OYM-6	OYH-2	OQX4-21	OQY-15A	OQY-10A	OPY2-6	OYM-2	OYG-3	OYI-2	OQY-14A	OQX4-7	OQX4-10	OYN-2	OPY2-10	OOH2-24	OYM-5
27-Oct-11	26-Oct-11	27-Oct-11	27-Oct-11	17-Oct-11	17-Oct-11	17-Oct-11	?	?	?	?	18-Oct-11	18-Oct-11	18-Oct-11	?	18-Oct-11	25-Oct-11	?
55	46	56	30	47	39	31	40	32	24	33	17	25	18	12	19	7	13
9300	9200	8900	8900	8700	8700	8600	8500	8500	8500	8500	8600	8700	8700	8900	9000	9400	9400
OOH2-17	OYH-3	R1008-OQX	OYM-3	OQY-14	OQY-3	OQX3-2	OOH2-16	OOH2-4	OPY2-2	OPY2-7	OQX3-11	OQY-4	OQX4-6	R1007-OOH	OPY2-29	OOF2-2	OOF2-1
25-Oct-11	26-Oct-11	25-Oct-11	27-Oct-11	17-Oct-11	17-Oct-11	17-Oct-11	?	?	?	25-Oct-11	18-Oct-11	18-Oct-11	18-Oct-11	25-Oct-11	18-Oct-11	25-Oct-11	?
29	21	38	14	22	8	15	23	1	9	16	5	10	2	6	11	3	4
9300	9200	8900	8900	8700	8700	8600	8500	8500	8500	8600	8600	8700	8700	8900	9000	9300	9300
OOH2-8	OTD-12	R1010-OTD	R1005-OQW	OQY-16	OQX4-18	OQY-3A	OOF4-4	OTD-13	OPY2-15	OQY-4A	OQX3-7	OQX4-22	OQY-1	R1001-OPY	OPY2-24	OOH2-10	OYO-6
25-Oct-11	25-Oct-11	25-Oct-11	25-Oct-11	17-Oct-11	17-Oct-11	17-Oct-11	?	?	?	18-Oct-11	18-Oct-11	18-Oct-11	18-Oct-11	25-Oct-11	18-Oct-11	25-Oct-11	?



14E, South Anchorage (Looking East)

109	117	100	124	116	130	123	115	135	129	122	134	128	137	133	127	136	132
9500	9400	9200	9100	9000	8900	8800	8800	8800	8800	8900	8900	9000	9100	9200	9300	9600	9700
OTD-23D	OYG-5	OYJ-6	OPY3-22	OPY2-35	OYJ-4	OQX5-19	OQX5-24	OQX5-28	OQX5-12	OQY-23B	OPY4-21	OPY2-37	OPY3-18	OYO-5	OOH-1E	OYJ-11	OYM-8
?	?	?	6-Oct-11	6-Oct-11	?	7-Oct-11	8-Oct-11	8-Oct-11	8-Oct-11	4-Nov-11	4-Nov-11	10-Oct-11	11-Oct-11	4-Nov-11	?	?	?
83	92	82	108	91	99	107	98	106	114	105	121	113	120	126	119	131	125
9500	9400	9200	9100	9000	8900	8800	8800	8800	8800	8900	8900	9000	9100	9200	9300	9600	9700
OTD-1D	OYI-4	OYN-11	OPY3-16	OPY2-39	OPY4-17	OQX5-27	OQX5-13	OQX5-22	OQX5-3	OPY4-22	OPY4-19	?	OPY3-9	R1011-OTD	OYJ-9	OOF4-2	OOF5-4
?	?	?	6-Oct-11	6-Oct-11	7-Oct-11	7-Oct-11	8-Oct-11	8-Oct-11	8-Oct-11	4-Nov-11	4-Nov-11	10-Oct-11	11-Oct-11	4-Nov-11	?	?	11-Oct-11
64	73	63	72	81	71	90	80	89	97	88	96	104	112	103	111	118	110
9500	9400	9200	9100	9000	8900	8800	8800	8800	8800	8900	8900	9000	9100	9200	9300	9600	9700
OYH-7	OYM-4	OYO-4	OPY3-23	OPY2-22	OPY4-16	OQX5-23	OQX5-21	OQX5-15	OQX5-29	OPY4-20	OYI-3	OPY2-33	OPY3-25	OOH-4F	OYP-4	OYI-5	OOF5-1
?	?	?	6-Oct-11	6-Oct-11	7-Oct-11	7-Oct-11	8-Oct-11	8-Oct-11	8-Oct-11	4-Nov-11	4-Nov-11	10-Oct-11	11-Oct-11	4-Nov-11	4-Nov-11	?	11-Oct-11
54	45	53	62	52	61	70	79	69	78	87	77	95	86	94	102	93	101
9500	9500	9200	9100	9000	8900	8800	8800	8800	8800	8900	8900	9000	9100	9200	9300	9600	9700
OOF3-8	OYM-9	OTD-4	OPY3-20	OPY2-20	OPY4-1	OQX5-11	OQX5-30	OQX5-14	OQX5-4	OPY4-10	OPY4-9	OPY2-28	OPY3-6	OTD-1H	OYO-7	OOF4-9	OOF5-2
?	?	11-Oct-11	6-Oct-11	6-Oct-11	7-Oct-11	6-Oct-11	8-Oct-11	8-Oct-11	8-Oct-11	10-Oct-11	10-Oct-11	10-Oct-11	11-Oct-11	4-Nov-11	4-Nov-11	11-Oct-11	11-Oct-11
37	28	36	44	35	43	51	60	50	59	68	58	67	76	85	75	84	
9600	9500	9200	9100	9000	8900	8800	8800	8800	8800	8900	8900	9000	9100	9300	9300	9600	
OYH-8	OYJ-8	OTD-16	OPY3-26	OPY2-18	OPY4-13	OQX5-8	OQX5-18	OQX5-26	OQX5-6	OPY4-7	OPY4-8	OPY2-36	OPY3-27	OOH-2F	OYN-8	OOF4-3	
?	?	5-Oct-11	6-Oct-11	6-Oct-11	6-Oct-11	6-Oct-11	7-Oct-11	8-Oct-11	8-Oct-11	10-Oct-11	10-Oct-11	10-Oct-11	11-Oct-11	4-Nov-11	4-Nov-11	11-Oct-11	
20	27	19	26	34	42	33	41	49	40	48	57	66	56	65	74		
9600	9500	9200	9100	9000	8900	8800	8800	8800	8800	8900	8900	9000	9100	9300	9300		
OYH-9	OTD-2D	OTD-17	OPY3-24	OPY2-9	OQW-5	OQX5-10	OQX5-7	OQX5-25	OQX5-2	OPY4-15	OPY4-11	OPY2-32	OPY3-7	OOH2-19	OOH-3F		
?	?	5-Oct-11	5-Oct-11	5-Oct-11	6-Oct-11	6-Oct-11	7-Oct-11	7-Oct-11	7-Oct-11	10-Oct-11	10-Oct-11	10-Oct-11	11-Oct-11	4-Nov-11	4-Nov-11		
13	7	12	18	11	25	17	24	32	23	31	39	47	38	46	55		
9600	9600	9200	9100	9000	8900	8900	8800	8800	8800	8900	8900	9000	9100	9300	9300		
OOF4-5	OOF4-8	OTD-5	OPY3-2	OPY2-21	OPY4-4	OPY4-12	OQX5-20	OQX5-9	OQX5-1	OPY4-14	OPY4-18	OPY2-34	OPY3-19	OYN-10	OYN-9		
?	5-Oct-11	5-Oct-11	5-Oct-11	5-Oct-11	6-Oct-11	6-Oct-11	7-Oct-11	7-Oct-11	7-Oct-11	10-Oct-11	10-Oct-11	10-Oct-11	11-Oct-11	4-Nov-11	4-Nov-11		
4	3	6	2	10	5	16	9	1	15	8	22	14	30	21	29		
9500	9500	9200	9100	9000	9000	8900	8800	8800	8800	8900	8900	9000	9100	9300	9300		
R1006-OTD	OOF3-4	OTD-18	OPY3-1	OPY2-25	?	OQW-3	OQX5-17	OQX5-16	OQX5-5	OPY4-2	OPY4-6	OPY2-27	OPY3-21	OOH2-22	OOH2-6		
?	5-Oct-11	5-Oct-11	5-Oct-11	5-Oct-11	6-Oct-11	6-Oct-11	7-Oct-11	7-Oct-11	7-Oct-11	10-Oct-11	10-Oct-11	10-Oct-11	11-Oct-11	11-Oct-11	11-Oct-11		

The PWS Anchor Rods for Lift 14E, E-Line Anchorage, for Strands #5 and #113 are both 9000 mm rods. One rod is OPY2-30 and the other rod is OPY2-31. The galvanizing has filled in the rod ID punch marks enough on those two that the ID could not be conclusively determined.



Total No.	No. by Load	Rod ID No.	Rod length (mm)	Load No.	Tag Release Date - Orange	Tag Release Date - Blue	Jobsite Arrival Date
1	1	OOF2-1	9400	1	-	30-Aug-11	6-Sep-11
2	2	OOF3-4	9500	1	-	30-Aug-11	6-Sep-11
3	3	OOF4-3	9600	1	-	30-Aug-11	6-Sep-11
4	4	OOF4-8	9600	1	-	30-Aug-11	6-Sep-11
5	5	OOF4-9	9600	1	-	30-Aug-11	6-Sep-11
6	6	OOF5-1	9700	1	-	30-Aug-11	6-Sep-11
7	7	OOF5-2	9700	1	-	30-Aug-11	6-Sep-11
8	8	OOF5-4	9700	1	-	30-Aug-11	6-Sep-11
9	9	OOH2-22	9300	1	-	30-Aug-11	6-Sep-11
10	10	OOH2-6	9300	1	-	30-Aug-11	6-Sep-11
11	11	OPY2-10	9000	1	-	30-Aug-11	6-Sep-11
12	12	OPY2-18	9000	1	-	30-Aug-11	6-Sep-11
13	13	OPY2-20	9000	1	-	30-Aug-11	6-Sep-11
14	14	OPY2-21	9000	1	-	30-Aug-11	6-Sep-11
15	15	OPY2-22	9000	1	-	30-Aug-11	6-Sep-11
16	16	OPY2-23	9000	1	-	30-Aug-11	6-Sep-11
17	17	OPY2-24	9000	1	-	30-Aug-11	6-Sep-11
18	18	OPY2-25	9000	1	-	30-Aug-11	6-Sep-11
19	19	OPY2-26	9000	1	-	30-Aug-11	6-Sep-11
20	20	OPY2-4	9000	1	-	30-Aug-11	6-Sep-11
21	21	OPY2-9	9000	1	-	30-Aug-11	6-Sep-11
22	22	OPY3-1	9100	1	-	30-Aug-11	6-Sep-11
23	23	OPY3-2	9100	1	-	30-Aug-11	6-Sep-11
24	24	OPY3-6	9100	1	-	30-Aug-11	6-Sep-11
25	25	OPY3-7	9100	1	-	30-Aug-11	6-Sep-11
26	26	OPY3-9	9100	1	-	30-Aug-11	6-Sep-11
27	27	OPY4-1	8900	1	-	30-Aug-11	6-Sep-11
28	28	OPY4-10	8900	1	-	30-Aug-11	6-Sep-11
29	29	OPY4-11	8900	1	-	30-Aug-11	6-Sep-11
30	30	OPY4-12	8900	1	-	30-Aug-11	6-Sep-11
31	31	OPY4-13	8900	1	-	30-Aug-11	6-Sep-11
32	32	OPY4-2	8900	1	-	30-Aug-11	6-Sep-11
33	33	OPY4-4	8900	1	-	30-Aug-11	6-Sep-11
34	34	OPY4-6	8900	1	-	30-Aug-11	6-Sep-11
35	35	OPY4-7	8900	1	-	30-Aug-11	6-Sep-11
36	36	OPY4-8	8900	1	-	30-Aug-11	6-Sep-11
37	37	OPY4-9	8900	1	-	30-Aug-11	6-Sep-11
38	38	OQW-3	8900	1	30-Aug-11	-	6-Sep-11
39	39	OQW-5	8900	1	30-Aug-11	-	6-Sep-11
40	40	OTD-16	9200	1	-	30-Aug-11	6-Sep-11
41	41	OTD-17	9200	1	-	30-Aug-11	6-Sep-11
42	42	OTD-18	9200	1	-	30-Aug-11	6-Sep-11
43	43	OTD-4	9200	1	-	30-Aug-11	6-Sep-11
44	44	OTD-5	9200	1	-	30-Aug-11	6-Sep-11
45	1	OPY2-27	9000	2	-	30-Aug-11	2-Sep-11
46	2	OPY2-28	9000	2	-	30-Aug-11	2-Sep-11
47	3	OPY2-29	9000	2	-	30-Aug-11	2-Sep-11
48	4	OPY2-30	9000	2	-	30-Aug-11	2-Sep-11
49	5	OPY2-31	9000	2	-	30-Aug-11	2-Sep-11

Total No.	No. by Load	Rod ID No.	Rod length (mm)	Load No.	Tag Release Date - Orange	Tag Release Date - Blue	Jobsite Arrival Date
50	6	OPY2-32	9000	2	-	30-Aug-11	2-Sep-11
51	7	OPY2-33	9000	2	-	30-Aug-11	2-Sep-11
52	8	OPY2-34	9000	2	-	30-Aug-11	2-Sep-11
53	9	OPY2-35	9000	2	-	30-Aug-11	2-Sep-11
54	10	OPY2-36	9000	2	-	30-Aug-11	2-Sep-11
55	11	OPY2-37	9000	2	-	30-Aug-11	2-Sep-11
56	12	OPY2-38	9000	2	-	30-Aug-11	2-Sep-11
57	13	OPY2-39	9000	2	-	30-Aug-11	2-Sep-11
58	14	OPY3-16	9100	2	-	30-Aug-11	2-Sep-11
59	15	OPY3-18	9100	2	-	30-Aug-11	2-Sep-11
60	16	OPY3-19	9100	2	-	30-Aug-11	2-Sep-11
61	17	OPY3-20	9100	2	-	30-Aug-11	2-Sep-11
62	18	OPY3-21	9100	2	-	30-Aug-11	2-Sep-11
63	19	OPY3-22	9100	2	-	30-Aug-11	2-Sep-11
64	20	OPY3-23	9100	2	-	30-Aug-11	2-Sep-11
65	21	OPY3-24	9100	2	-	30-Aug-11	2-Sep-11
66	22	OPY3-25	9100	2	-	30-Aug-11	2-Sep-11
67	23	OPY3-26	9100	2	-	30-Aug-11	2-Sep-11
68	24	OPY3-27	9100	2	-	30-Aug-11	2-Sep-11
69	25	OPY4-14	8900	2	-	30-Aug-11	2-Sep-11
70	26	OPY4-15	8900	2	-	30-Aug-11	2-Sep-11
71	27	OPY4-16	8900	2	-	30-Aug-11	2-Sep-11
72	28	OPY4-17	8900	2	-	30-Aug-11	2-Sep-11
73	29	OPY4-18	8900	2	-	30-Aug-11	2-Sep-11
74	30	OQX4-10	8700	2	30-Aug-11	-	2-Sep-11
75	31	OQX4-11	8700	2	30-Aug-11	-	2-Sep-11
76	32	OQX4-12	8700	2	30-Aug-11	-	2-Sep-11
77	33	OQX4-13	8700	2	30-Aug-11	-	2-Sep-11
78	34	OQX4-5	8700	2	30-Aug-11	-	2-Sep-11
79	35	OQX4-6	8700	2	30-Aug-11	-	2-Sep-11
80	36	OQX4-7	8700	2	30-Aug-11	-	2-Sep-11
81	37	OQX4-9	8700	2	30-Aug-11	-	2-Sep-11
82	38	OQX5-1	8800	2	30-Aug-11	-	2-Sep-11
83	39	OQX5-10	8800	2	30-Aug-11	-	2-Sep-11
84	40	OQX5-11	8800	2	30-Aug-11	-	2-Sep-11
85	41	OQX5-2	8800	2	30-Aug-11	-	2-Sep-11
86	42	OQX5-3	8800	2	30-Aug-11	-	2-Sep-11
87	43	OQX5-4	8800	2	30-Aug-11	-	2-Sep-11
88	44	OQX5-5	8800	2	30-Aug-11	-	2-Sep-11
89	45	OQX5-6	8800	2	30-Aug-11	-	2-Sep-11
90	46	OQX5-7	8800	2	30-Aug-11	-	2-Sep-11
91	47	OQX5-8	8800	2	30-Aug-11	-	2-Sep-11
92	48	OQX5-9	8800	2	30-Aug-11	-	2-Sep-11
93	1	OQX3-11	8600	3	31-Aug-11	-	6-Sep-11
94	2	OQX3-13	8600	3	31-Aug-11	-	6-Sep-11
95	3	OQX3-16	8600	3	31-Aug-11	-	6-Sep-11
96	4	OQX3-2	8600	3	31-Aug-11	-	6-Sep-11
97	5	OQX3-5	8600	3	31-Aug-11	-	6-Sep-11
98	6	OQX3-7	8600	3	31-Aug-11	-	6-Sep-11

Total No.	No. by Load	Rod ID No.	Rod length (mm)	Load No.	Tag Release Date - Orange	Tag Release Date - Blue	Jobsite Arrival Date
99	7	OQX3-8	8600	3	31-Aug-11	-	6-Sep-11
100	8	OQX4-17	8700	3	31-Aug-11	-	6-Sep-11
101	9	OQX4-18	8700	3	31-Aug-11	-	6-Sep-11
102	10	OQX4-20	8700	3	31-Aug-11	-	6-Sep-11
103	11	OQX4-21	8700	3	31-Aug-11	-	6-Sep-11
104	12	OQX4-22	8700	3	31-Aug-11	-	6-Sep-11
105	13	OQX4-23	8700	3	31-Aug-11	-	6-Sep-11
106	14	OQX4-24	8700	3	31-Aug-11	-	6-Sep-11
107	15	OQX5-12	8800	3	31-Aug-11	-	6-Sep-11
108	16	OQX5-13	8800	3	31-Aug-11	-	6-Sep-11
109	17	OQX5-14	8800	3	31-Aug-11	-	6-Sep-11
110	18	OQX5-15	8800	3	31-Aug-11	-	6-Sep-11
111	19	OQX5-16	8800	3	31-Aug-11	-	6-Sep-11
112	20	OQX5-17	8800	3	31-Aug-11	-	6-Sep-11
113	21	OQX5-18	8800	3	31-Aug-11	-	6-Sep-11
114	22	OQX5-19	8800	3	31-Aug-11	-	6-Sep-11
115	23	OQX5-20	8800	3	31-Aug-11	-	6-Sep-11
116	24	OQX5-21	8800	3	31-Aug-11	-	6-Sep-11
117	25	OQX5-22	8800	3	31-Aug-11	-	6-Sep-11
118	26	OQX5-23	8800	3	31-Aug-11	-	6-Sep-11
119	27	OQX5-24	8800	3	31-Aug-11	-	6-Sep-11
120	28	OQX5-25	8800	3	31-Aug-11	-	6-Sep-11
121	29	OQX5-26	8800	3	31-Aug-11	-	6-Sep-11
122	30	OQX5-27	8800	3	31-Aug-11	-	6-Sep-11
123	31	OQX5-28	8800	3	31-Aug-11	-	6-Sep-11
124	32	OQX5-29	8800	3	31-Aug-11	-	6-Sep-11
125	33	OQX5-30	8800	3	31-Aug-11	-	6-Sep-11
126	34	OQY-1	8700	3	31-Aug-11	-	6-Sep-11
127	35	OQY-10A	8600	3	31-Aug-11	-	6-Sep-11
128	36	OQY-12A	8600	3	31-Aug-11	-	6-Sep-11
129	37	OQY-14	8700	3	31-Aug-11	-	6-Sep-11
130	38	OQY-14A	8600	3	31-Aug-11	-	6-Sep-11
131	39	OQY-15	8700	3	31-Aug-11	-	6-Sep-11
132	40	OQY-15A	8700	3	31-Aug-11	-	6-Sep-11
133	41	OQY-16	8700	3	31-Aug-11	-	6-Sep-11
134	42	OQY-17A	8600	3	31-Aug-11	-	6-Sep-11
135	43	OQY-19	8700	3	31-Aug-11	-	6-Sep-11
136	44	OQY-1A	8600	3	31-Aug-11	-	6-Sep-11
137	45	OQY-2	8700	3	31-Aug-11	-	6-Sep-11
138	46	OQY-3	8700	3	31-Aug-11	-	6-Sep-11
139	47	OQY-3A	8600	3	31-Aug-11	-	6-Sep-11
140	48	OQY-4	8700	3	31-Aug-11	-	6-Sep-11
141	49	OQY-4A	8600	3	31-Aug-11	-	6-Sep-11
142	50	OQY-6A	8600	3	31-Aug-11	-	6-Sep-11
143	51	OQY-9A	8600	3	31-Aug-11	-	6-Sep-11
144	1	OOF2-2	9400	5	-	20-Oct-11	24-Oct-11
145	2	OOF3-8	9500	5	20-Oct-11	-	24-Oct-11
146	3	OOF4-2	9600	5	-	20-Oct-11	24-Oct-11
147	4	OOF4-4	8500	5	-	20-Oct-11	24-Oct-11

Total No.	No. by Load	Rod ID No.	Rod length (mm)	Load No.	Tag Release Date - Orange	Tag Release Date - Blue	Jobsite Arrival Date
148	5	OOF4-5	9600	5	20-Oct-11	-	24-Oct-11
149	6	OOH2-10	9300	5	20-Oct-11	-	24-Oct-11
150	7	OOH2-16	8500	5	20-Oct-11	-	24-Oct-11
151	8	OOH2-17	9300	5	20-Oct-11	-	24-Oct-11
152	9	OOH2-19	9300	5	-	20-Oct-11	24-Oct-11
153	10	OOH2-24	9300	5	-	20-Oct-11	24-Oct-11
154	11	OOH2-4	8500	5	20-Oct-11	-	24-Oct-11
155	12	OOH2-7	9300	5	-	20-Oct-11	24-Oct-11
156	13	OOH2-8	9300	5	-	20-Oct-11	24-Oct-11
157	14	OPY2-15	8500	5	20-Oct-11	-	24-Oct-11
158	15	OPY2-2	8500	5	-	20-Oct-11	24-Oct-11
159	16	OPY2-6	8500	5	-	20-Oct-11	24-Oct-11
160	17	OPY2-7	8500	5	-	20-Oct-11	24-Oct-11
161	18	OTD-12	9200	5	-	20-Oct-11	24-Oct-11
162	19	OTD-13	8500	5	-	20-Oct-11	24-Oct-11
163	20	R1001-OPY	8900	5	20-Oct-11	-	24-Oct-11
164	21	R1002-OTD	9300	5	20-Oct-11	-	24-Oct-11
165	22	R1005-OQW	8900	5	20-Oct-11	-	24-Oct-11
166	23	R1006-OTD	9500	5	20-Oct-11	-	24-Oct-11
167	24	R1007-OOH	8900	5	20-Oct-11	-	24-Oct-11
168	25	R1008-OQX	8900	5	20-Oct-11	-	24-Oct-11
169	26	R1010-OTD	8900	5	20-Oct-11	-	24-Oct-11
170	1	OYG-3	8500	6	-	21-Oct-11	26-Oct-11
171	2	OYG-4	8900	6	-	21-Oct-11	26-Oct-11
172	3	OYG-5	9400	6	-	21-Oct-11	26-Oct-11
173	4	OYH-1	9200	6	-	21-Oct-11	26-Oct-11
174	5	OYH-2	8900	6	-	21-Oct-11	26-Oct-11
175	6	OYH-3	9200	6	-	21-Oct-11	26-Oct-11
176	7	OYH-6	8600	6	-	21-Oct-11	26-Oct-11
177	8	OYI-2	8500	6	-	21-Oct-11	26-Oct-11
178	9	OYJ-10	9300	6	-	21-Oct-11	26-Oct-11
179	10	OYJ-5	9200	6	-	21-Oct-11	26-Oct-11
180	11	OYJ-7	9300	6	-	21-Oct-11	26-Oct-11
181	12	OYL-7	8900	6	-	21-Oct-11	26-Oct-11
182	13	OYL-8	8700	6	-	21-Oct-11	26-Oct-11
183	14	OYM-1	9200	6	-	21-Oct-11	26-Oct-11
184	15	OYM-10	9300	6	-	21-Oct-11	26-Oct-11
185	16	OYM-2	8500	6	-	21-Oct-11	26-Oct-11
186	17	OYM-3	8900	6	-	21-Oct-11	26-Oct-11
187	18	OYM-4	9400	6	-	21-Oct-11	26-Oct-11
188	19	OYM-6	8900	6	-	21-Oct-11	26-Oct-11
189	20	OYM-7	9300	6	-	21-Oct-11	26-Oct-11
190	21	OYN-1	8700	6	-	21-Oct-11	26-Oct-11
191	22	OYN-10	9300	6	-	21-Oct-11	26-Oct-11
192	23	OYN-2	8900	6	-	21-Oct-11	26-Oct-11
193	24	OYO-3	9200	6	-	21-Oct-11	26-Oct-11
194	25	OYP-3	9300	6	-	21-Oct-11	26-Oct-11
195	26	OYP-5	9200	6	-	21-Oct-11	26-Oct-11
196	1	OOH-2F	9300	7	-	25-Oct-11	28-Oct-11

Total No.	No. by Load	Rod ID No.	Rod length (mm)	Load No.	Tag Release Date - Orange	Tag Release Date - Blue	Jobsite Arrival Date
197	2	OOH-3F	9300	7	-	25-Oct-11	28-Oct-11
198	3	OPY4-19	8900	7	-	25-Oct-11	28-Oct-11
199	4	OPY4-20	8900	7	-	25-Oct-11	28-Oct-11
200	5	OPY4-21	8900	7	-	25-Oct-11	28-Oct-11
201	6	OPY4-22	8900	7	-	25-Oct-11	28-Oct-11
202	7	OQX4-30	8700	7	-	25-Oct-11	28-Oct-11
203	8	OQY-19C	8500	7	-	25-Oct-11	28-Oct-11
204	9	OQY-20C	8500	7	-	25-Oct-11	28-Oct-11
205	10	OQY-21C	8500	7	-	25-Oct-11	28-Oct-11
206	11	OQY-22C	8500	7	-	25-Oct-11	28-Oct-11
207	12	OQY-23B	8900	7	-	25-Oct-11	28-Oct-11
208	13	OQY-25	8700	7	-	25-Oct-11	28-Oct-11
209	14	OQY-26	8700	7	-	25-Oct-11	28-Oct-11
210	15	OQY-3C	8500	7	-	25-Oct-11	28-Oct-11
211	16	OTD-1H	9200	7	-	25-Oct-11	28-Oct-11
212	17	OYH-7	9500	7	-	25-Oct-11	28-Oct-11
213	18	OYH-9	9600	7	-	25-Oct-11	28-Oct-11
214	19	OYI-3	8900	7	-	25-Oct-11	28-Oct-11
215	20	OYI-4	9400	7	-	25-Oct-11	28-Oct-11
216	21	OYJ-11	9600	7	-	25-Oct-11	28-Oct-11
217	22	OYJ-4	8900	7	-	25-Oct-11	28-Oct-11
218	23	OYJ-6	9200	7	-	25-Oct-11	28-Oct-11
219	24	OYJ-9	9300	7	-	25-Oct-11	28-Oct-11
220	25	OYM-8	9700	7	-	25-Oct-11	28-Oct-11
221	26	OYM-9	9500	7	-	25-Oct-11	28-Oct-11
222	1	OOH-1E	9300	8	-	27-Oct-11	31-Oct-11
223	2	OOH-4F	9200	8	-	27-Oct-11	31-Oct-11
224	3	OPY4-24	8900	8	-	27-Oct-11	31-Oct-11
225	4	OQY-13C	8500	8	-	27-Oct-11	31-Oct-11
226	5	OQY-14C	8500	8	-	27-Oct-11	31-Oct-11
227	6	OQY-15C	8500	8	-	27-Oct-11	31-Oct-11
228	7	OQY-18C	8500	8	-	27-Oct-11	31-Oct-11
229	8	OQY-23C	8500	8	-	27-Oct-11	31-Oct-11
230	9	OQY-27	8500	8	-	27-Oct-11	31-Oct-11
231	10	OQY-28	8700	8	-	27-Oct-11	31-Oct-11
232	11	OQY-29	8700	8	-	27-Oct-11	31-Oct-11
233	12	OQY-31	8700	8	-	27-Oct-11	31-Oct-11
234	13	OQY-32	8500	8	-	27-Oct-11	31-Oct-11
235	14	OTD-1D	9500	8	-	27-Oct-11	31-Oct-11
236	15	OTD-23D	9500	8	-	27-Oct-11	31-Oct-11
237	16	OTD-2D	9500	8	-	27-Oct-11	31-Oct-11
238	17	OTD-2E	9400	8	-	27-Oct-11	31-Oct-11
239	18	OYL-5	8900	8	-	27-Oct-11	31-Oct-11
240	19	OYL-6	8900	8	-	27-Oct-11	31-Oct-11
241	20	OYL-9	8900	8	-	27-Oct-11	31-Oct-11
242	21	OYN-10	9300	8	-	27-Oct-11	31-Oct-11
243	22	OYN-11	9200	8	-	27-Oct-11	31-Oct-11
244	23	OYN-3	8900	8	-	27-Oct-11	31-Oct-11
245	24	OYN-4	8900	8	-	27-Oct-11	31-Oct-11

Total No.	No. by Load	Rod ID No.	Rod length (mm)	Load No.	Tag Release Date - Orange	Tag Release Date - Blue	Jobsite Arrival Date
246	25	OYN-5	8900	8	-	27-Oct-11	31-Oct-11
247	26	OYO-4	9200	8	-	27-Oct-11	31-Oct-11
248	27	OYO-6	9300	8	-	27-Oct-11	31-Oct-11
249	1	OOF2-4	8500	9	28-Oct-11	-	1-Nov-11
250	2	OOH2-2	8500	9	-	28-Oct-11	1-Nov-11
251	3	OOH2-20	8500	9	-	28-Oct-11	1-Nov-11
252	4	OOH2-23	8500	9	28-Oct-11	-	1-Nov-11
253	5	OPY3-8	8500	9	28-Oct-11	-	1-Nov-11
254	6	OYG-1	8900	9	28-Oct-11	-	1-Nov-11
255	7	OYG-2	8500	9	28-Oct-11	-	1-Nov-11
256	8	OYH-8	9600	9	28-Oct-11	-	1-Nov-11
257	9	OYI-5	9600	9	28-Oct-11	-	1-Nov-11
258	10	OYJ-8	9500	9	28-Oct-11	-	1-Nov-11
259	11	OYK-4	8900	9	28-Oct-11	-	1-Nov-11
260	12	OYK-5	9000	9	28-Oct-11	-	1-Nov-11
261	13	OYL-4	9000	9	28-Oct-11	-	1-Nov-11
262	14	OYM-5	9400	9	28-Oct-11	-	1-Nov-11
263	15	OYN-6	8900	9	28-Oct-11	-	1-Nov-11
264	16	OYN-7	8900	9	28-Oct-11	-	1-Nov-11
265	17	OYN-8	9300	9	28-Oct-11	-	1-Nov-11
266	18	OYN-9	9300	9	28-Oct-11	-	1-Nov-11
267	19	OYO-5	9200	9	28-Oct-11	-	1-Nov-11
268	20	OYO-7	9300	9	28-Oct-11	-	1-Nov-11
269	21	OYO-8	8900	9	28-Oct-11	-	1-Nov-11
270	22	OYO-9	9200	9	28-Oct-11	-	1-Nov-11
271	23	OYP-4	9300	9	28-Oct-11	-	1-Nov-11
272	24	R1011-OTD	9200	9	28-Oct-11	-	1-Nov-11
273	1	OYL-3	8500	10	11-Nov-11	-	22-Nov-11
274	2	OYP-2	8500	10	11-Nov-11	-	22-Nov-11



STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

**NOTICE TO CONTRACTORS
AND**

SPECIAL PROVISIONS

**FOR CONSTRUCTION ON STATE HIGHWAY IN
SAN FRANCISCO COUNTY IN SAN FRANCISCO
FROM 0.6 KM TO 1.3 KM EAST OF THE YERBA BUENA TUNNEL EAST PORTAL**

DISTRICT 04, ROUTE 80

**For Use in Connection with Standard Specifications Dated JULY 1999, Standard Plans Dated JULY 1999, and Labor
Surcharge and Equipment Rental Rates.**

CONTRACT NO. 04-0120F4

04-SF-80-13.2/13.9

**Bids Open: February 1, 2006
Dated: August 1, 2005**

OSD

10-1.60 CABLE SYSTEM

GENERAL

Description

Cable system shall consist of construction of the shop prefabricated parallel wire strand (PWS) cable system and the suspender system, in accordance with the details shown on the plans, the provisions in Section 55, "Steel Structures," of the Standard Specifications and these special provisions.

The PWS cable system shall consist of furnishing, fabricating, and erecting the shop prefabricated parallel wire strands, strand sockets, strand anchor rods, shims and nuts, cable wrapping wire, zinc paste, cable bands, cable-band bolts, cable-band caulking, cable shrouds, cable hand ropes, hand-rope anchors, hand-rope supports, hand-rope gates, and appurtenances.

The suspender system shall consist of furnishing, fabricating, and erecting the suspender ropes, suspender rope sockets, suspender rope separators, suspender rope anchor rods and nuts, split collars, elastomeric collars, keeper angles, keeper bolts, shims, suspender clamps, and appurtenances.

Cable saddles shall conform to "Steel Structures" of these special provisions.

The Cable System shall be cleaned and painted in accordance with "Clean and Paint Cable System" of these special provisions.

Prequalification

Attention is directed to "Pre-Award Information/Questionnaire," of these special provisions.

Cable System Quality Control

The Contractor shall designate in writing a Cable System Quality Control Manager (CQCM). The CQCM shall be responsible to the Contractor for the quality control of furnishing and fabricating the Cable System including the materials testing program.

The CQCM shall not be employed by or compensated by any subcontractor, or by other persons or entities hired by subcontractors who will provide services or materials for the project. The CQCM may be an employee of the Contractor.

The CQCM shall be the individual solely responsible to the Contractor for submitting and receiving all correspondence, submittals, and reports regarding the furnishing and fabricating of the cable system sent to and received from the Engineer.

The CQCM shall review, guide, and monitor the shop inspection and shop quality control program, make shop visits at various stages of fabrication as required, and issue certificates of compliance to the Engineer for the materials and fabrication of the cable system.

The CQCM shall prepare test procedures and programs for testing the materials in the Cable System for compliance with the requirements in these special provisions. The CQCM shall review the materials test results, obtain and review certificates of compliance from the suppliers of materials for the Cable System, and submit these results to the Engineer.

Working Drawings

The Contractor shall submit working drawings for the construction of the cable system to the Engineer for approval in conformance with the provisions in "Working Drawings" and "Accelerated Working Drawing Submittals" of these special provisions.

The working drawings shall contain all information required for furnishing, fabricating, and erecting the cable system including, but not limited to, the following:

- A. Complete PWS cable system fabrication engineering documents and supporting calculations for the manufacture of cable wire and fabrication of the shop fabricated parallel wire strands (PWS) including, but not limited to, the following:
 1. Complete cable wire manufacturing drawings showing the cable wire drawing process, cable wire galvanizing process, cable wire coiling process, storage of the completed cable wires, and transportation methods for delivering the cable wire to the strand fabrication shop.
 2. Written procedures for the cable wire drawing process, cable wire galvanizing process, coiling the cable wires, protection and storage of the coiled cable wire, and transportation methods for delivering the cable wire to the strand fabrication shop.
 3. Written procedures for quality control and testing during the cable wire manufacturing process.
 4. Fabrication drawings showing the shop layout for the fabrication of the shop prefabricated parallel wire strand, procedures for measuring strand length for cutting and socketing, procedures for socketing strands, storage of the shop prefabricated strands, and transportation methods for delivering the shop prefabricated strands to the bridge site.

5. Written procedures for the fabrication of the shop prefabricated parallel wire strands, storage of the cable wires, storage of the shop prefabricated strands, and transportation methods for delivering the shop prefabricated strands to the bridge site.
 6. Written procedures for quality control and testing during the fabrication of the shop prefabricated parallel wire strands.
- B. Complete suspender system fabrication engineering documents and supporting calculations for furnishing and fabricating the suspender system including, but not limited to, the following:
1. Suspender ropes manufacturing procedures.
 2. Written procedures for quality control and testing during suspender rope manufacturing.
 3. Written procedures and drawings for pre-stretching, measuring, and socketing the suspender ropes.
- C. Complete cable system construction engineering documents and supporting calculations for erection and monitoring of the cable system including, but not limited to, the following:
1. Erection drawings, written procedures, and calculations showing the temporary works required for the cable system construction, including, but not limited to, footbridges, cross walks, hand ropes, storm restraint system, tramway hauling system, strand storage, unreeling equipment, and temporary cranes.
 2. The Contractor shall develop and verify, as part of his Erection Plan, a set of weights, reactions, box-girder cambers, cable profiles, and suspender forces, which are consistent with a box-girder moment diagram that lies within the range of the allowable box-girder moments shown on the plans. The computed as-built suspender forces of the Contractor's Erection Plan shall henceforth be referred to as suspender load.
 3. The Erection drawings, written procedures, and calculations showing each sequence for each stage of construction of the cable system and transfer of the suspender load to the cable system, including the method of transferring the load through the suspender system to the PWS cable system.
 4. Calculations for each sequence of each stage of construction of the cable system and transfer of the suspender load to the cable system.
 5. Establishing three-dimensional coordinate geometric control points for surveying and measuring the self-anchoring suspension structure for each stage of construction of the cable system and transfer of the suspender load to the cable system.
 6. Calculations for the three-dimensional geometric control points for surveying and measuring the self-anchoring suspension structure for each stage of construction including positioning of the tower saddle and the jacking saddle and transfer of the suspender load to the cable system.
 7. Substantiating calculations for the forces and stresses in the cable system and in the steel box girders and cross beams during the cable system construction including the final set of forces and stresses after the completion of cable system construction and transfer of the suspender load to the cable system.
 8. Written procedures and drawings showing the cable compaction procedures.
 9. Written procedures and drawings for cable wrapping procedures.
 10. Erection drawings for installation of the handropes.
 11. Written procedures and drawings for installation of cable bands, tightening cable band bolts, and cable band caulking.
 12. Written procedures and drawings of the procedures for the friction test of the cable bands.
 13. Erection drawings showing the installation of the suspender system.
 14. Calculations indicating the void ratio within the saddles.
- D. Record of Project Tests
- At the completion of testing, the Contractor shall gather all test data and submit it to the Engineer in a final report. The final report shall include the following:
1. Laboratories where tests were conducted
 2. Certificates of calibration
 3. Names of standard tests
 4. Photographs of the test apparatus
 5. A brief description of what is being tested and all test data, including stress strain curves or load deformation curves, and test data from manufacturers.

The report shall be submitted in a format approved by the Engineer. A draft copy shall be reviewed and approved by the Engineer before the final report is submitted. Twenty bound hard copies and two electronic copies of the approved final report shall be submitted to the Engineer.

The Contractor shall allow the Engineer 60 days to review and approve the cable system working drawings.

Shipping, Handling and Storing Materials

Each heat of steel used for the rod stock used for manufacturing the cable wire shall be identified by a reference number indicating the name of the supplier and date of production, and shall have attached a copy of the mill report for that heat number. The cable wire manufacturer shall track each heat number of the rod stock used in the cable wire drawing process and shall tag each production lot of cable wire with the heat number in such a manner that each production lot of cable wire can be traced back to the original heat numbers.

After drawing and galvanizing, the cable wire shall be formed into coils with a barrel diameter not less than 1500 mm. The finished coil shall be wrapped to protect the wire from damage during shipping and storage. Each coil shall be tagged with a serial number that indicates the heat numbers of the steel that was used to produce the cable wire, and the length and weight of cable wire. The serial number shall be transferred and attached to any wire specimen cut from the coil for testing. Cable wire shall be coiled in such a manner that it can be continuously uncoiled without damage.

After manufacturing, individual shop prefabricated parallel wire strands shall be reeled onto shipping reels with a barrel diameter not less than 2000 mm. Alternatively, individual shop prefabricated parallel wire strands may be shipped on shipping platforms. The parallel wire strands shall be coiled to a loop diameter not less than 2000 mm and shall be secured to the shipping platforms. The shipping platforms shall be constructed to protect the parallel wire strands against damage and shall support the coiled parallel wire strands against any instability of the coil stack by use of bracing or tie downs. Each reel or shipping platform shall be tagged with a strand serial number for that reel or shipping platform that indicates the serial numbers of the coils of cable wire that were used to produce the shop prefabricated parallel wire strand on the reel or shipping platform, the length and location within the cross section of the strand, and the weight of the strand and the total weight of the reeled package or shipping platform package. Shop prefabricated parallel wire strands shall be reeled or coiled in such a manner that the strand can be continuously unreel without damage to the strand and without tangling or jamming. The reels or shipping platforms shall be wrapped and adequately secured to protect the strand from damage during shipping and storage. Prior to strand shipping, sockets shall be securely fastened to the reel flanges or to the shipping platform. Sockets shall not bear against the strand wires. Prior to load out of the shipping platforms, the Contractor shall demonstrate to the Engineer that the parallel wire strand coil is properly secured to the shipping platform to resist the expected shipping loads. Reels or shipping platforms shall be stored within clean, dry enclosures until incorporated into the work. The Contractor shall provide suitable enclosures to prevent moisture from accumulating on the strands. Reels shall be lifted from suitable lifting points located on each flange. Shipping platforms shall be lifted from a minimum of four suitable lifting points located on the platform base perimeter.

MATERIALS AND FABRICATION

General

Material used for the permanent structure shall be purchased new specifically for this contract. The Contractor shall purchase sufficient quantities of material considering the requirements for supplementary material testing, including material for testing as specified herein.

Cable system materials inspection shall conform to the provisions of Section 55-1.03, "Inspection," of the Standard Specifications.

Cable Wire

Cable wire shall be manufactured from steel produced by the basic oxygen or electric furnace process. Wire rod shall be rolled on a rod mill and coiled for shipment to the wire mill. Rods, bright wire, and galvanized wire shall be marked and kept segregated for identification of heat and serial numbers during manufacture.

After drawing is completed, wire shall be hot dip galvanized in molten zinc of purity not less than 99.90 percent conforming to the requirements of ASTM Designation: B6 - High Grade.

A chemical analysis to determine the composition of the steel shall be made by the manufacturer during the pouring of each heat of steel. A copy of this analysis, certified by the manufacturer, shall be furnished to the Engineer immediately on the completion of the analysis. The steel shall conform to the following requirements for chemical composition on cast analysis:

	Percent
Carbon	0.78 to 0.85
Silicon	0.15 to 1.00
Manganese	0.60 to 0.90
Phosphorus	Not Exceeding 0.025
Sulfur	Not Exceeding 0.025
Copper	Not Exceeding 0.10
Nickel	Not Exceeding 0.10
Chromium	Not Exceeding 0.10
Other Elements	Not Exceeding 0.07

Product analyses shall be performed on the finished cable wire or rod. The samples for product analyses shall be taken from any portion of the material, as directed by the Engineer. The steel shall conform to the following requirements for chemical composition variance:

	Over Max.	Under Min.
Carbon	0.01	0.02
Silicon	0.05	0.0
Manganese	0.02	0.02
Phosphorus	0.004	
Sulfur	0.004	
Copper	0.0	
Nickel	0.0	
Chromium	0.0	

Product analysis tests shall be conducted on a minimum of 10 samples of random heats. Material from the heat for which test samples do not meet the specified requirements shall be rejected. The Contractor shall provide additional testing, as directed by the Engineer, to ensure the steel quality in other cable wire produced from the same heat as the failed specimen. For each failed specimen, testing shall consist of a minimum of 2 additional samples from the same heat. If either of the additional samples do not meet the specified requirements, the heat will be rejected. Additional testing shall be completed at the Contractor's expense as approved by the Engineer.

The minimum number of tests to be carried out for the various properties of the cable wire is as follows:

Test	Minimum Number of Tests
Tensile Strength, Yield Stress, Proportional Limit, Percent Elongation and Modulus of Elasticity	One test piece taken from each end of every coil or fraction thereof
Elongation and Reduction in Area	One test piece taken from each end of every 10th coil or fraction thereof
Torsional Ductility	One test piece taken from one end of every 10th coil or fraction thereof
Diameter	One test piece taken from one end of every coil
Zinc Coating	One test piece taken from one end of every 5th coil or fraction thereof
Uniformity of Zinc Coat	One test piece taken from one end of every 5th coil or fraction thereof
Zinc Adhesion	One test piece taken from one end of every 10th coil or fraction thereof
Wire Straightness	One test piece taken from one end of every 5th coil or fraction thereof

If the wire fails in the first test to meet any requirement of this section, two additional tests shall be made on samples of wire from the same coil. If failure occurs in either of these tests, the coil of wire shall be rejected.

A stress-strain curve shall be obtained to determine the proportional limit, the yield stress using the 0.2 percent offset strain method, the ultimate strength and the elastic modulus. Extensometer readings shall be taken continuously or at every 50 microstrains or less. The gauge length shall be 250 mm and the extensometer shall be sensitive to 0.125 mm. The load shall be applied steadily at a rate not greater than 5 mm per minute.

To test for elongation and for reduction in area, a 250-mm gauge length shall be marked on the specimen and the load applied until the specimen breaks and the ultimate load recorded. Tests in which fracture occurs outside the central 200 mm of the gauge length shall be discarded and the test repeated on an additional sample from the same coil until a fracture is obtained within the central 200 mm. The broken parts of the test lengths shall be reassembled to obtain proper contact between the broken parts and the distance between gauge marks shall be measured. The extension of this distance from the original 250 mm shall be not less than 10 mm.

The reduction in area shall be determined on this same specimen by measuring the diameter of the reduced section at the break in two directions and calculating the area. The reduction in area from the original measured area of the cable wire shall be not less than 35 percent.

Zinc coated cable wires shall be tested for specified weight, uniformity, and adhesion of the zinc coating in conformance with the requirements of ASTM Designations A 90 and A 239. The uniformity of zinc coating shall be visually inspected on the finished coils. Coils will be rejected if discontinuities in the zinc coating are present.

For testing straightness, a 10-m length of cable wire shall be placed under a tension of 1500 N and shall not exhibit any kinks, bends, or wavy conditions.

During the production of cable wire, the Contractor shall avoid any manufacturing processes after galvanizing. If the Contractor proposes any manufacturing processes after galvanizing, the Contractor shall demonstrate to the Engineer that zinc coating will not be damaged as a result of any proposed manufacturing processes after galvanizing.

Shop Prefabricated Parallel Wire Strand (PWS)

The shop fabrication of PWS shall account for the angle changes occurring at cable saddles and within the cable geometry as shown on the plans.

Parallel wire strands shall be shop fabricated by bundling cable wires in parallel and drawing through a former that shapes and compacts the cable wires into a hexagonal shape strand. Strands shall be made with continuous wires free of

welds, couplers, or any other type of splice. The cable wires shall be arranged parallel with each other within the strand and the strand shall be free of intersections or wire crossings. The strand shall be free of loose wires, flaws, or other defects.

Each strand shall be banded with reinforced plastic tape at approximately 1.5-m intervals. Plastic bands shall be sufficient in strength and ductility to maintain the strand wires in a compact group during strand fabrication, reeling, storage, transportation, and erection. Plastic bands shall not prevent proper compaction of the cable.

Across the saddles, where curvature is significant, the parallel wire strands shall be formed to the appropriate radius, and strand clamps applied as necessary to maintain the wire alignment and prevent subsequent wire longitudinal slippage during erection. Alternatively, additional restraints shall be applied to prevent localized wire bulging after the erection of each strand. The strand clamps or restraints shall be removed at suitable intervals during the strand erection program. The strand clamps or restraints shall not damage the PWS wires.

One outside gauge wire at an apex of the hexagonal cross section of each strand shall be colored and precision-measured for its entire length. Based on the gauge wire, circumferential marks shall be placed on each strand at the theoretical centerline positions of tower saddles, deviation saddles, jacking saddle and splay saddles. The theoretical length is the total cable length calculated based on the dead load state of the bridge as established by the erection plan developed by the Contractor and approved by the Engineer. At the option of the Contractor, the length-measured gauge wire may be separate from the colored wire, provided it can be easily identified along the length of the strand.

Each end of the strand shall be socketed with zinc or zinc-copper alloy. The strand sockets shall conform to ASTM Designation: A148M Grade 620-415. Zinc for socketing the strands shall conform to ASTM Designation: B6, High Grade. At the point of socketing, strand wires shall be tightly clamped together. The actual end-to-end length of each socketed strand shall be socketed to an accuracy within plus or minus 1/15,000 of its theoretical length.

The Contractor shall submit the strand socket details and socketing procedure specification, which is proposed as the standard of his operation. The Contractor shall submit a socket strength test procedure to the Engineer for approval. The procedure shall consist of tensioning the assembly of strands, sockets, and strand anchor rods. The Contractor shall prepare five specimens in accordance with the stated procedure. The specimen shall then be strength tested as follows:

The load shall be increased at a slow rate as approved by the Engineer up to 50% of the breaking strength. The Contractor shall keep records of load and elongation for at least 15 load points, if not continuously. While the loading is stopped, measure the extent that the cones have pulled through the mouth of the socket (pull-out).

The load shall be continued to failure. The load deformation shall be recorded by recording the distance between the sockets with each load, until the strand reaches the ultimate strength.

The average pull-out at 50 % of breaking strength shall not be greater than 8 mm with a maximum pull-out not greater than 12 mm.

The pull-out at failure shall not exceed 20 mm nor shall any wire fail or pull-out of the socket before the minimum specified capacity of the strand has been attained. Failure to meet these conditions may be cause for rejection of the socketing procedure, pending further evaluation of the cones.

The Contractor shall remove all the cones from the socket shells and cut them in any direction that the Engineer deems necessary to evaluate the voids in the cones or wire slippage.

Upon an evaluation of the cones, the Engineer may require an improved socketing procedure before production of the strands is allowed to proceed. Two additional specimens shall be manufactured to test the revised socketing procedure and both strands shall meet the stated requirements. Production strands shall not proceed without an approved socketing procedure.

The Contractor shall submit the revised socketing procedure to the Engineer in accordance with the requirements in "Working Drawings" of these special provisions.

The sockets shall be manufactured in accordance with the approved socketing procedure. The end sections of socketed strands shall be proof tested by loading to 900 MPa to ensure no socket slippage and no damage to strand zinc coating. Each proof test shall include the socket plus a minimum of 3 meters of the socketed strand. The Contractor shall demonstrate to the satisfaction of the Engineer that proof testing will not damage strand zinc coating. The Contractor may propose alternative socket proof testing procedures, as approved by the Engineer. The proposed alternative socket proof testing procedure shall be performed on the strand specimens prior to the strength testing required. If part A of the strength test demonstrates elongation of the strand with no sign of slippage, then the proposed alternative socket proof testing procedure may be used as the socket proof test for the strand socket.

The Contractor shall perform an "Unreeling Test" at the factory of the first PWS strand before shipping, and prior to reeling the rest of the PWS strands onto reels or shipping platforms. The test shall verify that the PWS strand can be unreeled continuously without tangling or jamming. In the event that tangling or jamming occurs, the Contractor shall revise the reeling procedures and repeat the "Unreeling Test" until it is successful.



DIST.	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SF	80	13.2/13.9	734	1204

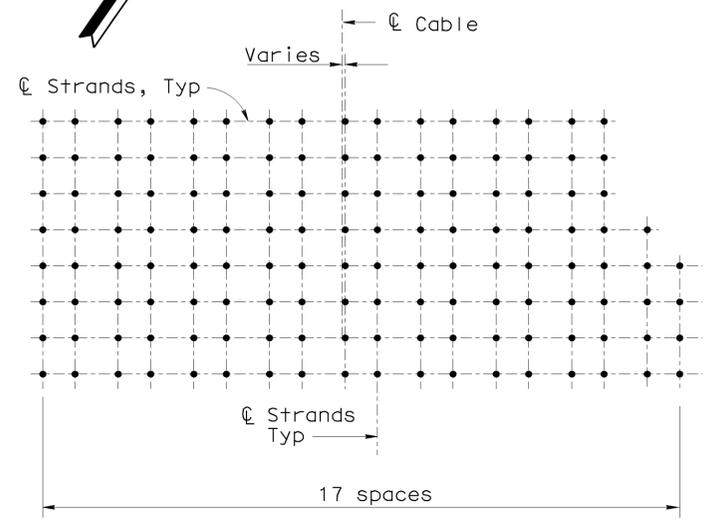
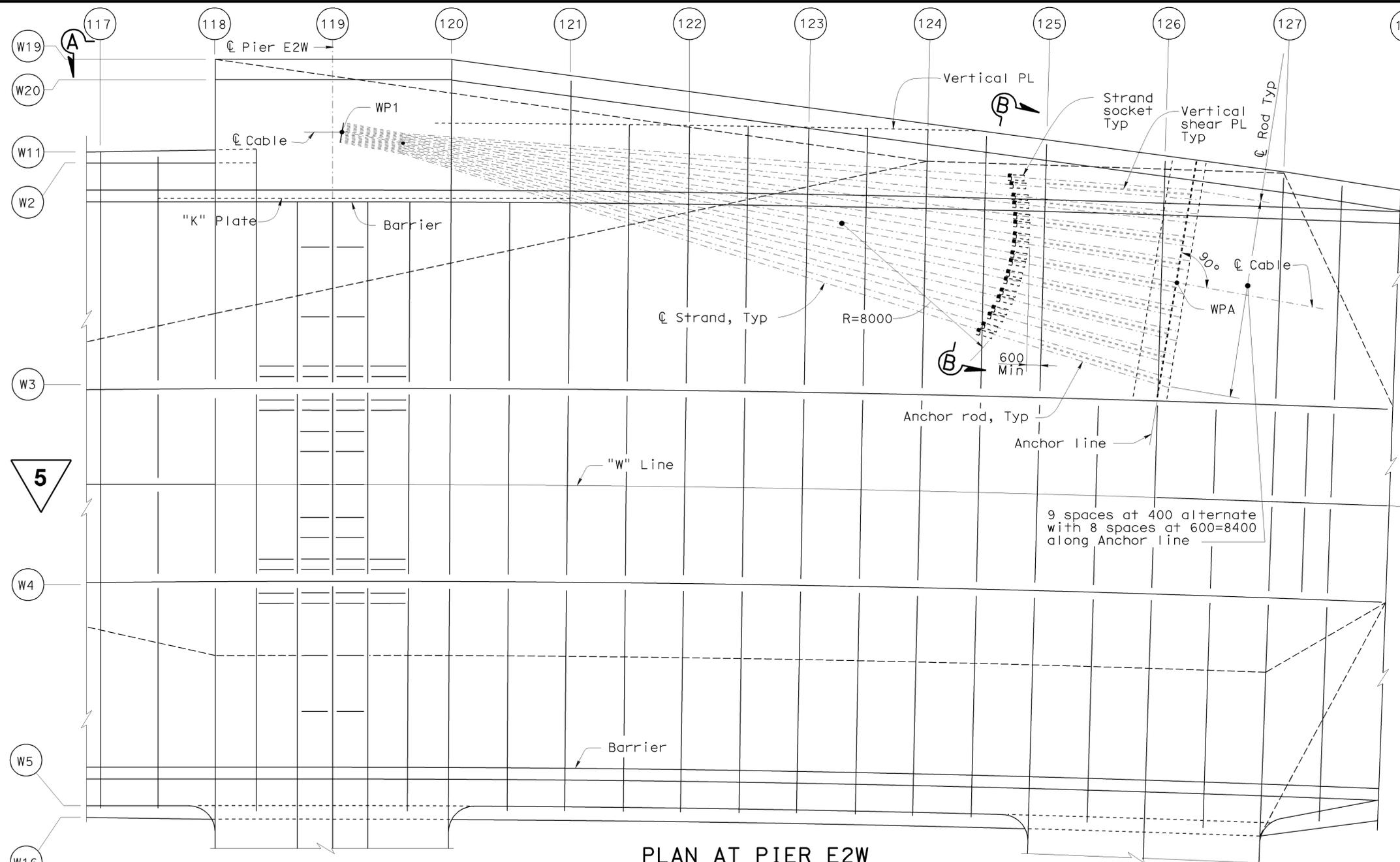
George Baker
REGISTERED ENGINEER - CIVIL
No. C57112
Exp. 12/31/05
STATE OF CALIFORNIA

PLANS APPROVAL DATE: 12-27-03
12-6-04

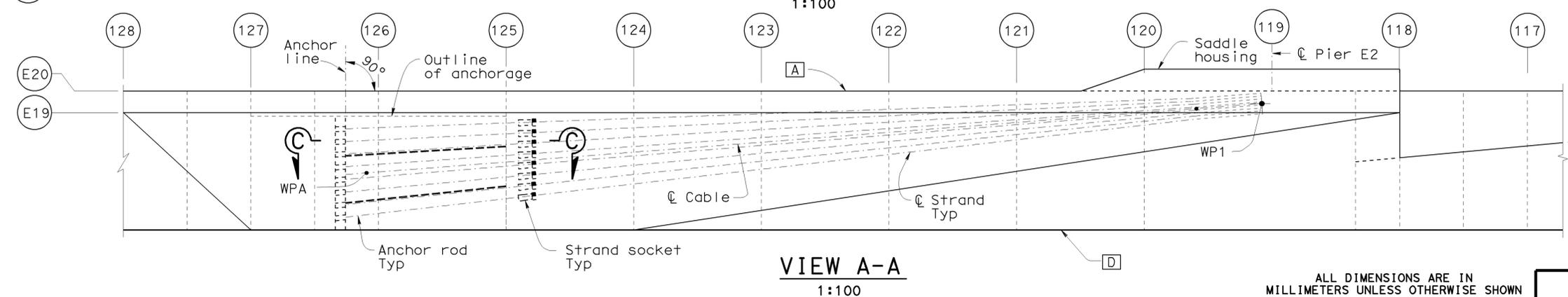
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T.Y. LIN / MOFFATT & NICHOL
825 BATTERY STREET
SAN FRANCISCO, CA 94111

To get to the web site, go to: <http://www.dot.ca.gov>



- NOTES:**
- For WP1, WPA and cable geometry, see "Suspension Cable Layout" sheets and "East Saddle Details" sheets.
 - The detailing of the anchor PL, the vertical shear plates, and their attachments are related to the cable geometry. The Contractor shall submit a layout of the cable anchorage to the Engineer for approval prior to producing shop drawings.
 - For "East Cable Anchorage "W" Line Layout" sheets all bolts shall be detailed according to the bolt dimension table. See "Typical Girder Details No.1" sheet. All bolts are HS, unless noted otherwise.
 - For "East Cable Anchorage "W" Line Layout" sheets unless noted otherwise all fillet welds shall be 6 mm for plate sizes not greater than 20 mm. For plates greater than 20 mm fillet welds shall be 8 mm unless noted otherwise.
 - For Section C-C, see "East Cable Anchorage "W" Line Layout No.2" sheet.
 - For "East Cable Anchorage "W" Line" sheets all details are similar (UNO) to those on "East Cable Anchorage "E" Line" sheets.



R. Valizadeh/V.Toan/Y.L./W.L./F.C.
DESIGN OVERSIGHT
SIGN OFF DATE 12/07/05

5 REVISED PER ADDENDUM NO. 5
DATED DECEMBER 21, 2005

DESIGN	BY G. Baker	CHECKED J. Kuliki
DETAILS	BY M. Gulyas	CHECKED T. McMeans
QUANTITIES	BY M. Gulyas	CHECKED M. Roberts

PREPARED FOR THE
STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

R. Manzanarez
PROJECT ENGINEER

BRIDGE NO.
34-006L/R
KILOMETER POST
13.2/13.9

**SAN FRANCISCO OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT
SELF-ANCHORED SUSPENSION BRIDGE
(SUPERSTRUCTURE & TOWER)**
EAST CABLE ANCHORAGE "W" LINE LAYOUT NO.1

Rev. Date: 5-18-98

ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS

CU 04
EA 0120F1

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES (PRELIMINARY STAGE ONLY)	SHEET	OF
01/25/99 05/25/99 09/02/99 01/21/00 04/06/02 07/04/02 12/07/05	317	

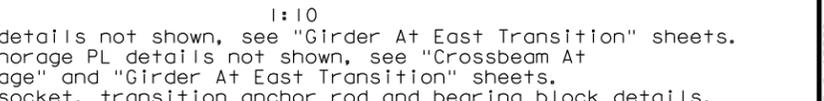
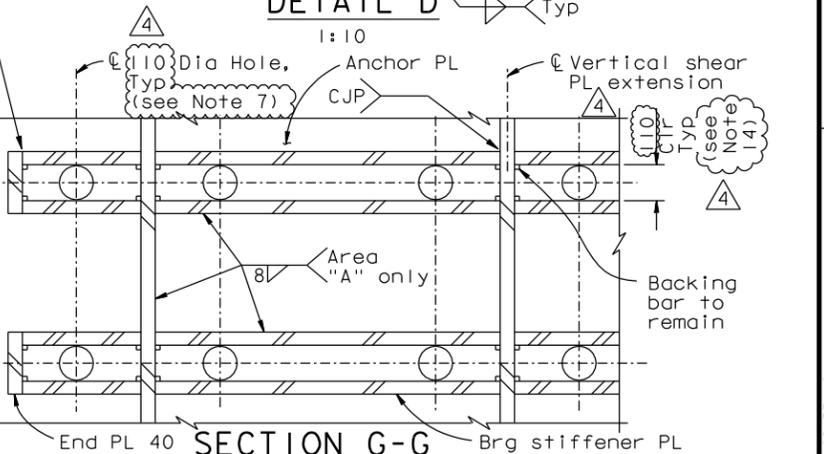
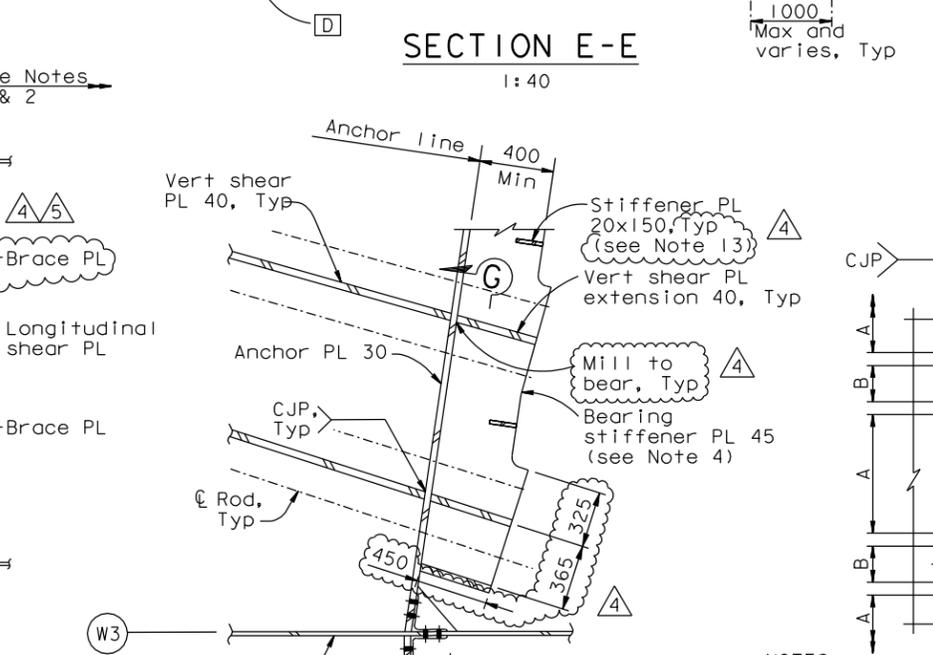
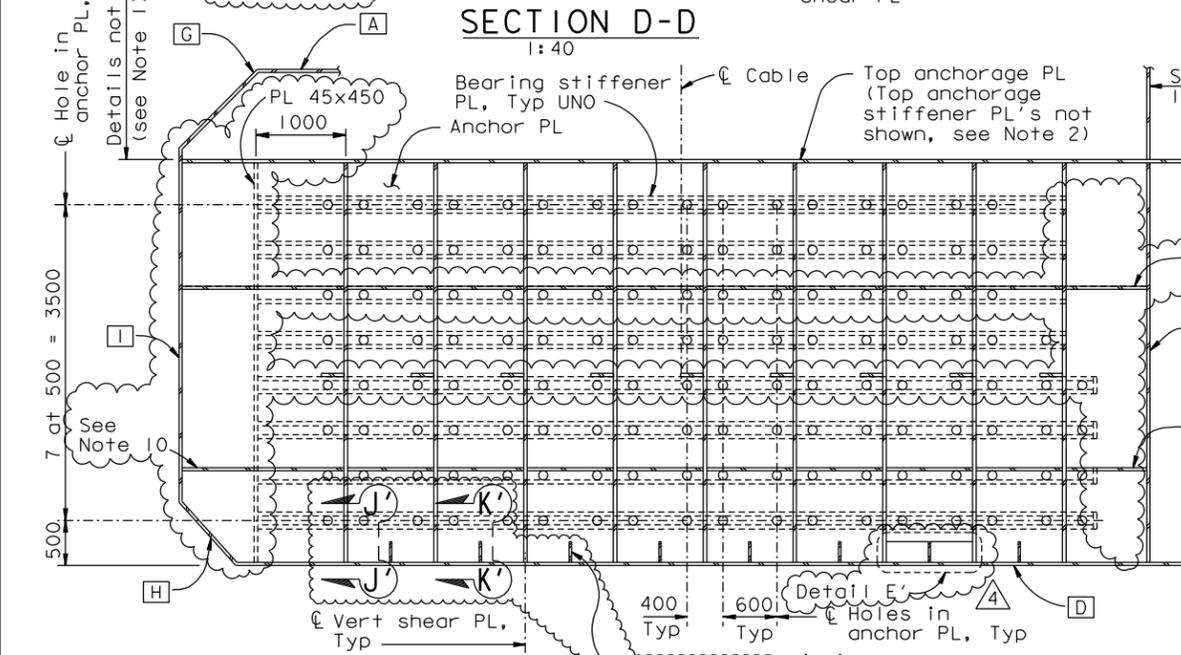
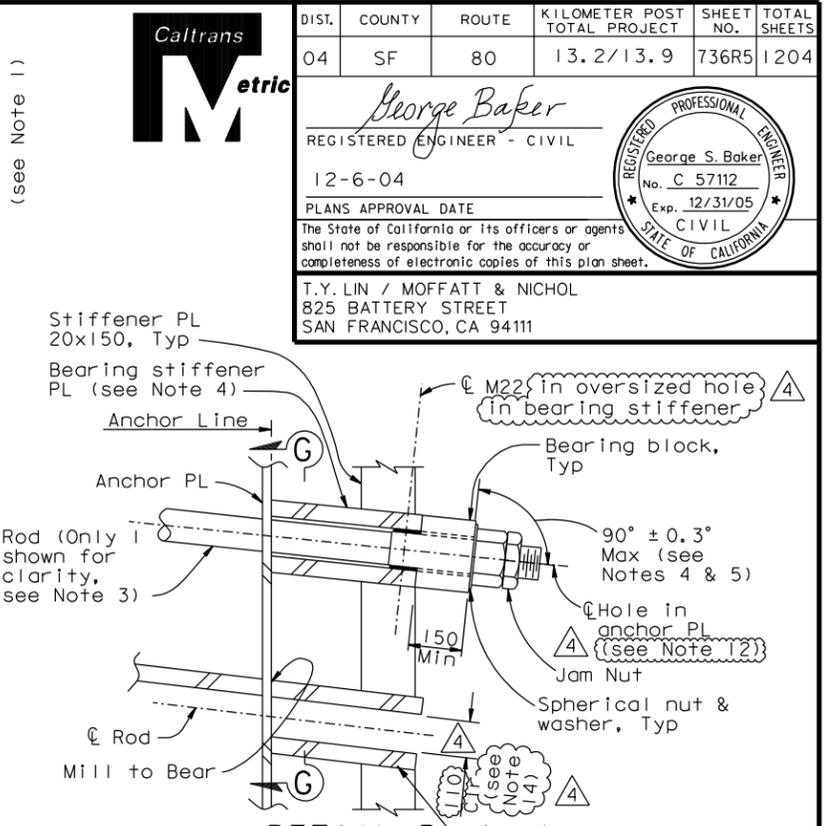
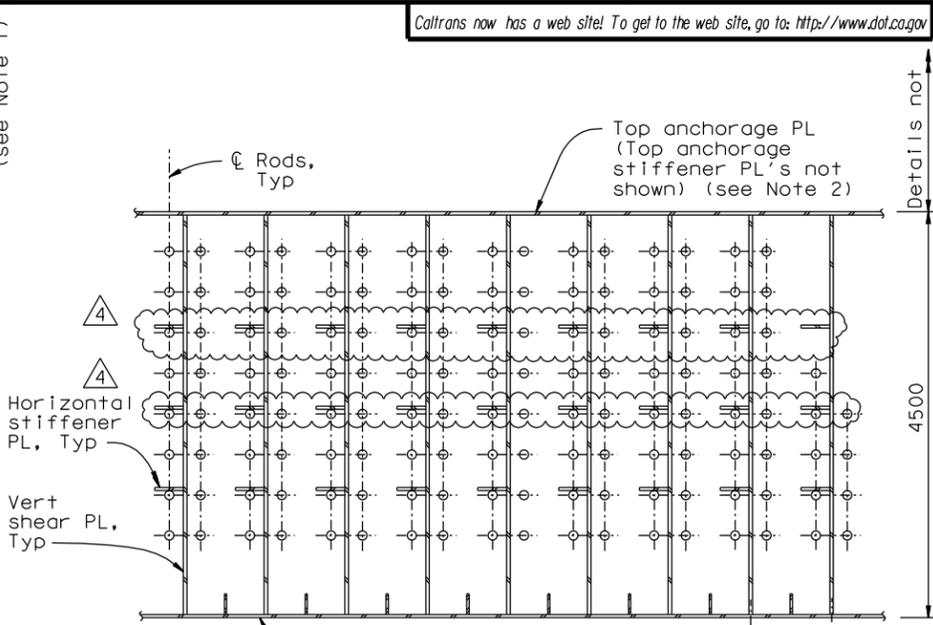
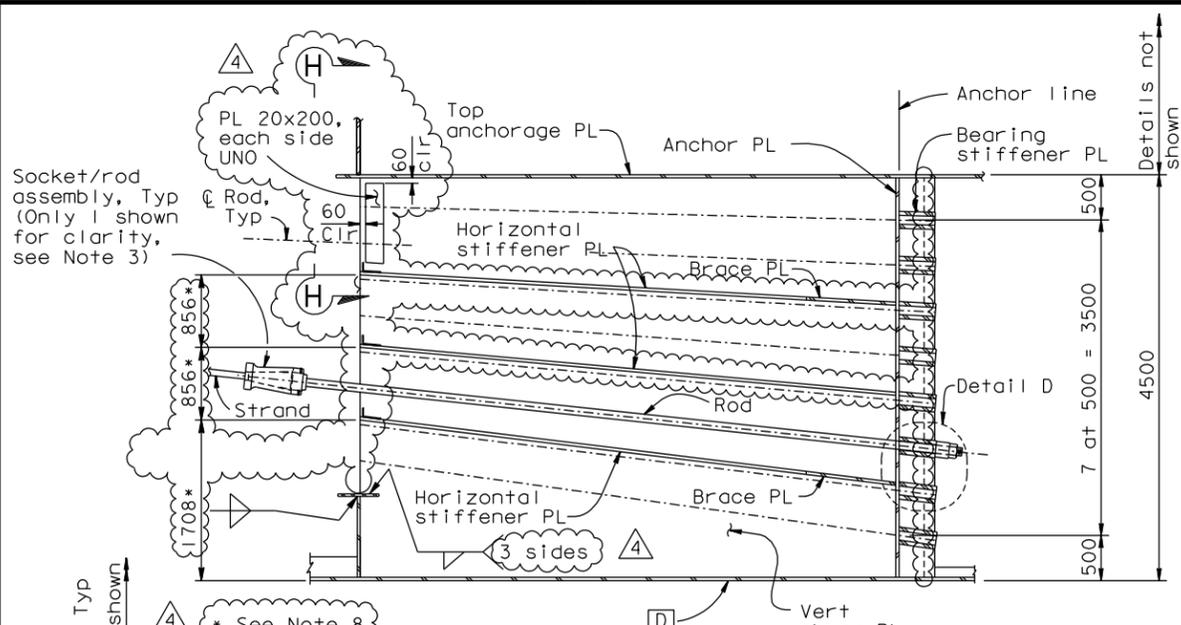
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DIST.	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
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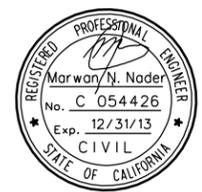
George Baker
REGISTERED ENGINEER - CIVIL
No. C 57112
Exp. 12/31/05
CIVIL
STATE OF CALIFORNIA

12-6-04
PLANS APPROVAL DATE
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825 BATTERY STREET
SAN FRANCISCO, CA 94111



- NOTES:
- For girder details not shown, see "Girder At East Transition" sheets.
 - For top anchorage PL details not shown, see "Crossbeam At East Anchorage" and "Girder At East Transition" sheets.
 - For strand socket, transition anchor rod and bearing block details, see "East Cable Anchorage Details" sheet.
 - Bearing stiffeners plates shall be machined to level the bearing block under the nut. The installation tolerance for the bearing block/anchor rod angle is $\pm 1^\circ$. Also see Note 6 on "East Cable Anchorage "W" Line Layout No.2" sheet.
 - The bearing blocks shall be aligned with the bearing stiffener plates. The angle between the bearing block and the anchor rod may vary (up to $90^\circ \pm 0.3^\circ$ Max) due to the averaging of the bearing stiffeners across each row of anchors.
 - For View H-H and Detail E', see "East Cable Anchorage "E" Line Layout No.3B" sheet.
 - At the Contractor's option, anchor rod hole may be increased to 120 mm Dia.
 - Dimensions shown with an asterisk shall be adjusted as necessary to provide 25 mm Min clearance above the strand and 50 mm Min below the strand.
- ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN

- All stiffeners shall terminate at each face of anchor PL with CJP welds.
- Face I stiffeners shall terminate 100 clear of brace PL as required. For stiffener termination details, see "Typical Girder Details No.16" sheet.
- For Views J'-J' and K'-K', see "East Anchorage "E" Line Layout No.2A" sheet.
- The Contractor may drill the 110 mm Dia holes in the anchor PL normal to the anchor PL instead of along the anchor rod axis.
- In cases where the top most stiffener PL 20x150 would interfere with bolts in the top anchorage PL, the top most stiffener only shall be relocated to the nearest position that is 60 mm clear of bolt ϕ .
- At the Contractor's option, clear spacing between bearing stiffener PL's may be increased to 130 mm.



CONTRACT CHANGE ORDER NO. _____
SHEET _____ OF _____

REQUESTS FOR INFORMATION NOT ADDRESSED IN THIS CCO REMAIN IN FORCE

MARK	DATE	DESCRIPTIONS	BY	CH'D	CCO#
A	01/04/13	EAST END OBG	GB	MN	87
A	09/01/11	EAST END OBG	GB	MN	87
A	03/25/11	SUSPENSION CABLE MISCELLANEOUS DETAILS	DT	GB	185
A	01/28/11	MISCELLANEOUS CABLE SYSTEM DETAILS	DT	GB	3751
A	08/28/09	BEARING BLOCKS	DT	GB	78

DESIGN	BY G. Baker	CHECKED J. Kuliki
DETAILS	BY M. Gulyas	CHECKED T. McMeans
QUANTITIES	BY M. Gulyas	CHECKED M. Roberts

PREPARED FOR THE
STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

BRIDGE NO.	34-0006L/R
KILOMETER POST	13.2/13.9

SAN FRANCISCO OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT
SELF-ANCHORED SUSPENSION BRIDGE
(SUPERSTRUCTURE & TOWER)
EAST CABLE ANCHORAGE "W" LINE LAYOUT NO.3

R. Valizadeh/V. Toan/Y.L./W.L./F.C.
DESIGN OVERSIGHT
Rgn Valizadeh / V. Toan / Y. Lin
SIGN OFF DATE 01/04/13

Rev. Date: 5-18-98



CU 04
EA 0120F1

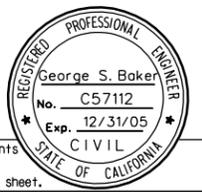
DISREGARD PRINTS BEARING EARLIER REVISION DATES	REVISION DATES (PRELIMINARY STAGE ONLY)	SHEET	OF
	01/25/99 05/21/99 08/27/99 05/21/01 04/28/02 01/24/02 12/13/05	319R5	

100% P&E DATE PLOTTED => 04 JAN 2013 TIME PLOTTED => 09:55:18 USERNAME => DWINOW

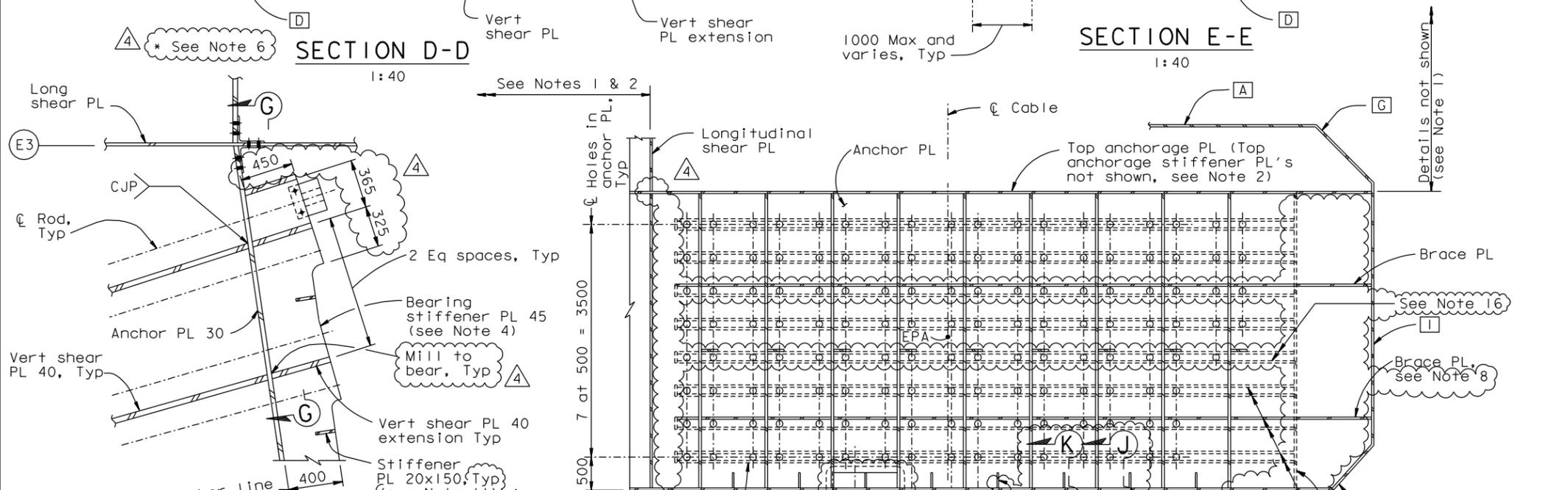
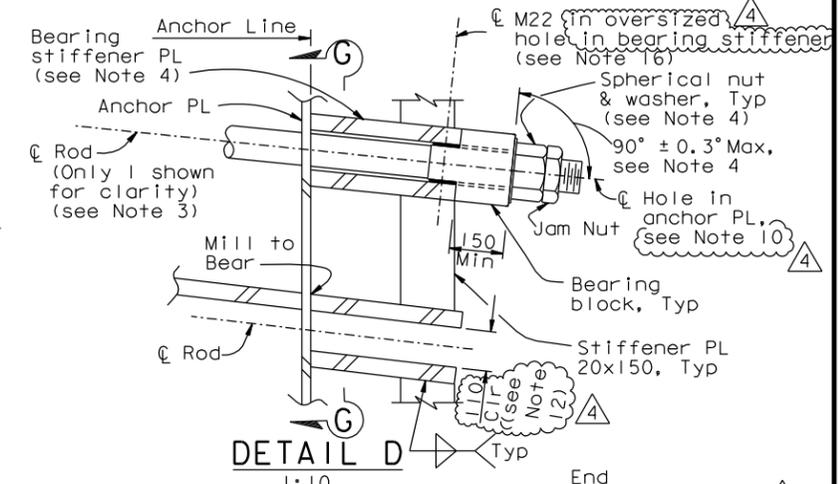
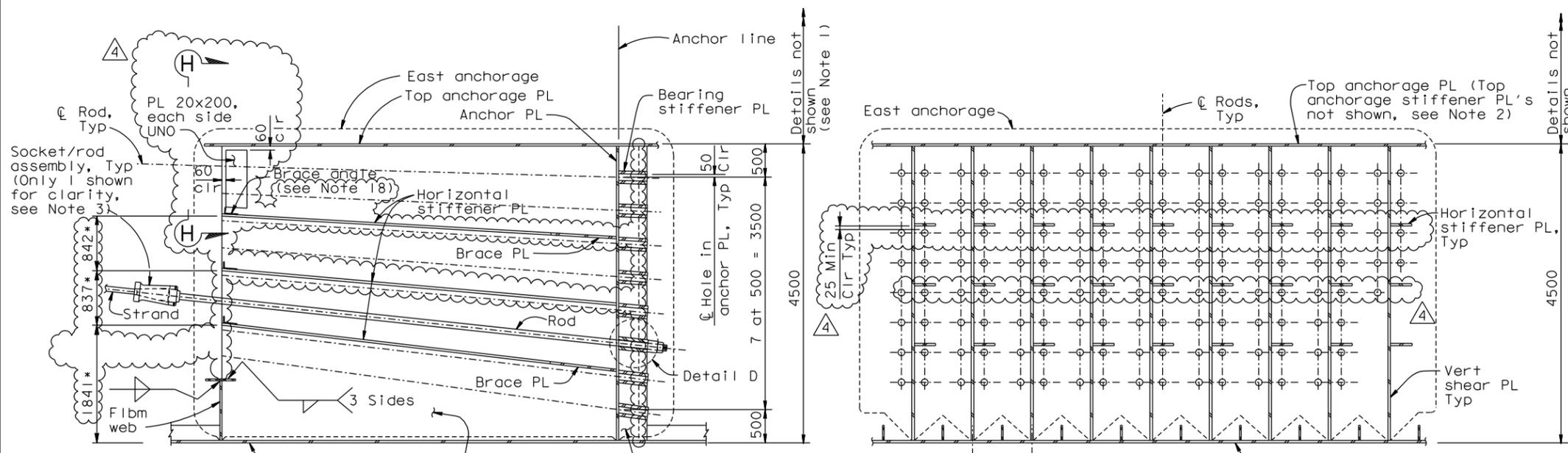


DIST.	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SF	80	13.2/13.9	733R4	1204

George Baker
 REGISTERED ENGINEER - CIVIL
 12-6-04
 PLANS APPROVAL DATE
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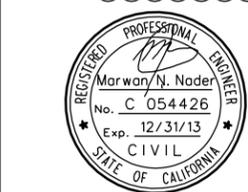


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- NOTES:
- For girder details not shown, see "Girder At East Transition" sheets.
 - For top anchorage PL details not shown, see "Crossbeam At East Anchorage" and "Girder At East Transition" sheets.
 - For strand socket, transition anchor rod and bearing block details, see "East Cable Anchorage Details" sheet.
 - Bearing stiffener PL shall be machined to level the bearing block under the nut. The installation tolerance for the bearing block/anchor rod angle is ±1°. Also see Note 6 on "East Cable Anchorage "E" Line Layout No. 2" sheet.
 - For View H-H and Detail E, see "East Cable Anchorage "E" Line Layout No. 3B" sheet.
 - Dimensions shown with an asterisk shall be adjusted as necessary to provide 25 mm Min clearance above the strand and 50 mm Min below the strand.
 - Type 13 stiffeners shall terminate at each face of anchor PL with CJP welds.
 - Face \square stiffeners shall terminate 100 clear of brace PL as required. For stiffener termination details, see "Typical Girder Details No. 16" sheet.

- At the Contractor's option, clear spacing between bearing stiffener PL's may be increased to 130mm.
- At the Contractor's option, anchor rod hole may be increased to 120mm Dia.
- For Notes 15 and above, see "East Cable Anchorage "E" Line Layout No. 3A" sheet.



CONTRACT CHANGE ORDER NO. _____
 SHEET _____ OF _____

REQUESTS FOR INFORMATION NOT ADDRESSED IN THIS CCO REMAIN IN FORCE				
MARK	DATE	DESCRIPTIONS	BY	CH'D
Δ	03/21/12	EAST END OBG	GB	MN 87
Δ	03/25/11	SUSPENSION CABLE MISCELLANEOUS DETAILS	DT	GB 185
Δ	01/28/11	MISCELLANEOUS CABLE SYSTEM DETAILS	DT	GB 3751
Δ	08/28/09	BEARING BLOCKS	DT	GB 78
MARK	DATE	DESCRIPTIONS	BY	CH'D

DESIGN	BY G. Baker	CHECKED J. Kulike
DETAILS	BY M. Guyias	CHECKED T. McMeans
QUANTITIES	BY M. Guyias	CHECKED M. Roberts

PREPARED FOR THE
 STATE OF CALIFORNIA
 DEPARTMENT OF TRANSPORTATION

R. Manzanarez	BRIDGE NO.
PROJECT ENGINEER	34-0006L/R
	KILOMETER POST
	13.2/13.9

SAN FRANCISCO OAKLAND BAY BRIDGE
 EAST SPAN SEISMIC SAFETY PROJECT
 SELF-ANCHORED SUSPENSION BRIDGE
 (SUPERSTRUCTURE & TOWER)
EAST CABLE ANCHORAGE "E" LINE LAYOUT NO. 3

Rev. Date: 5-18-98
 R. Valizadeh/V. Toan/Y.L./W.L./F.C.
 DESIGN OVERSIGHT
 SIGN OFF DATE 03/21/12

ORIGINAL SCALE IN MILLIMETERS
 FOR REDUCED PLANS

CU 04
 EA 0120F1

DISREGARD PRINTS BEARING EARLIER REVISION DATES	REVISION DATES (PRELIMINARY STAGE ONLY)	SHEET	OF
	01/25/99 05/15/99 08/28/99 05/31/01 04/08/02 01/04/02 12/19/02 11/13/05	316R4	

NOTES:

- For details of longitudinal shear plate between P125 and P127, see "Girder At East Transition No.16" sheet.
- For details of splice connection at girder plate and vertical plate convergence, see "East Cable Anchorage Details" sheet.
- For strand socket and anchor rod details, see "East Cable Anchorage Details" sheet.

- For Detail C and Sections D-D, E-E and F-F, see "East Cable Anchorage "W" Line Layout No.3" sheet.
- Machining of bearing stiffener not shown in plan view.
- The bearing blocks shall be aligned with the bearing stiffener plates. The angle between the bearing block and the anchor rod may vary (up to $90^\circ \pm 0.3^\circ$ Max) due to the averaging of the bearing stiffeners orientation across each row of anchors.

- At the Contractor's option, a PL 25x200 may be used in lieu of a brace angle.
- At the Contractor's option, bolts may be moved to 50 mm from the face of the vertical shear PL, and the L203 or PL 25 extended, to provide additional clearance from the strands, subject to the review and approval of the Engineer.

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Metric

DIST.	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SF	80	13.2/13.9	735R4	1204

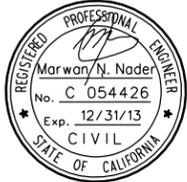
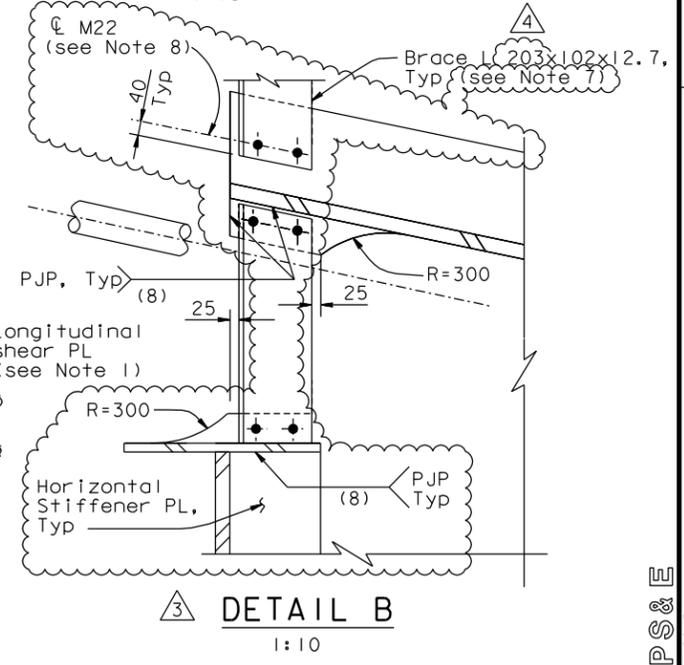
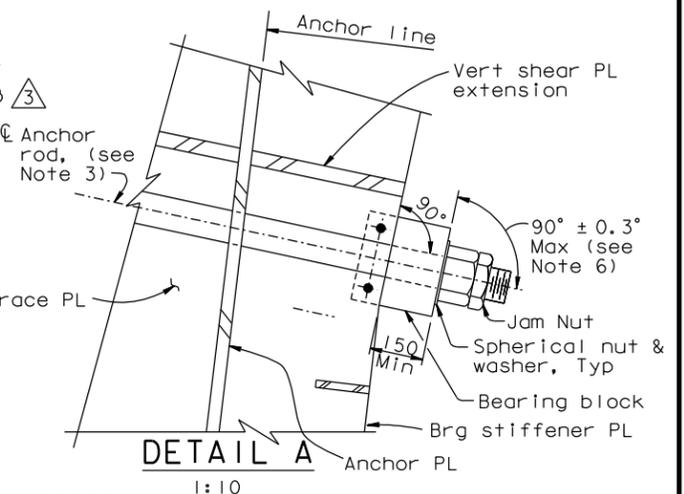
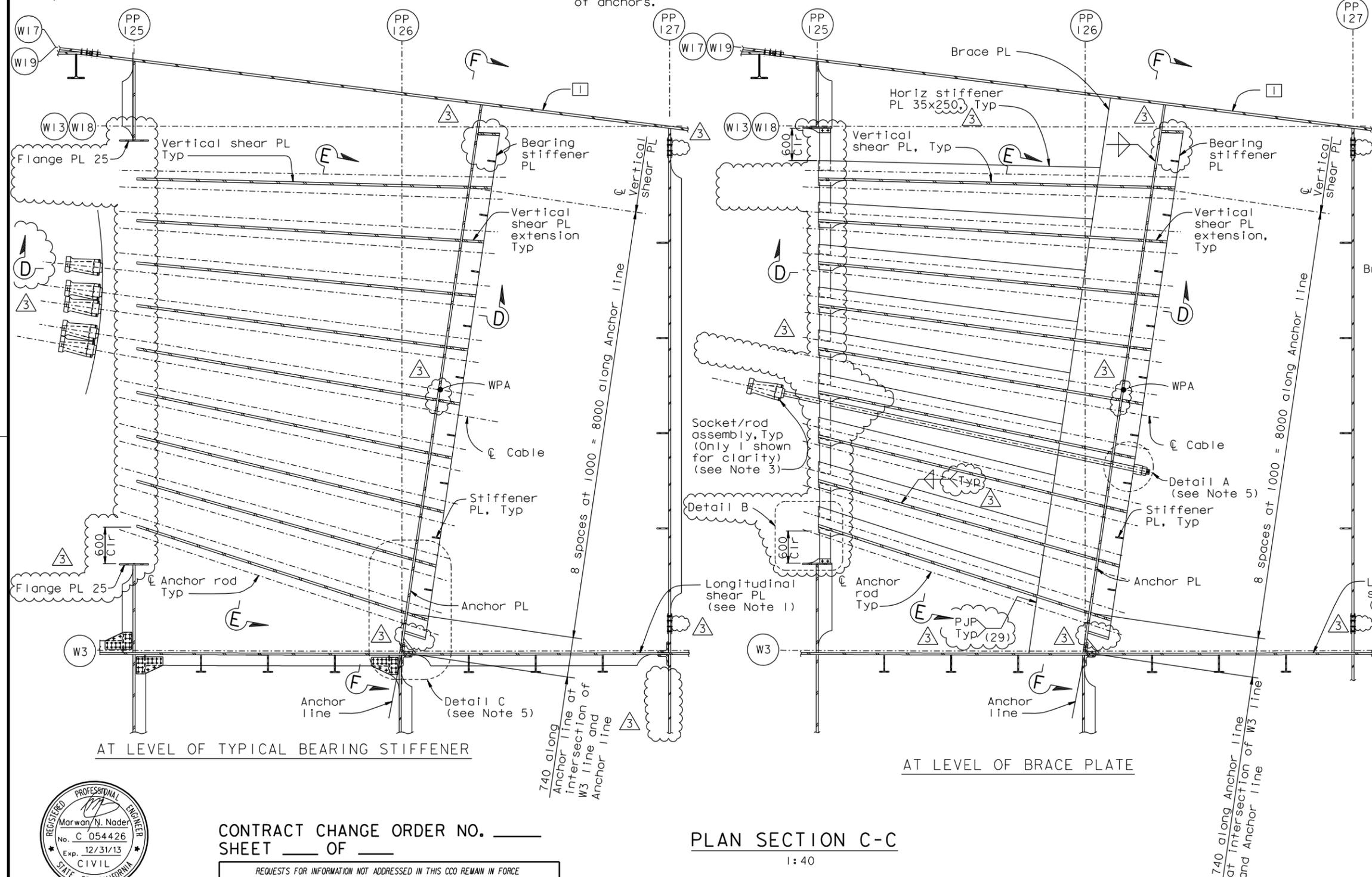
George Baker
REGISTERED ENGINEER - CIVIL
No. C 57112
Exp. 12/31/05
CIVIL
STATE OF CALIFORNIA

12-6-04
PLANS APPROVAL DATE

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CONTRACT CHANGE ORDER NO. _____
SHEET _____ OF _____

PLAN SECTION C-C
1:40

REQUESTS FOR INFORMATION NOT ADDRESSED IN THIS CCO REMAIN IN FORCE

MARK	DATE	DESCRIPTIONS	BY	CH'D	CCO#
▲	01/04/13	EAST END OBG	MN	DT	87
▲	09/01/11	EAST END OBG	MN	DT	87
▲	04/08/11	SUSPENSION CABLE MISCELLANEOUS DETAILS	GB	MN	185
▲	01/28/11	MISCELLANEOUS CABLE SYSTEM DETAILS	GB	MN	37S1

DESIGN	BY G. Baker	CHECKED J. Kuliki
DETAILS	BY M. Gulyas	CHECKED T. McMeans
QUANTITIES	BY M. Gulyas	CHECKED M. Roberts

PREPARED FOR THE
STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

R. Manzanarez
PROJECT ENGINEER

SAN FRANCISCO OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT
SELF-ANCHORED SUSPENSION BRIDGE
(SUPERSTRUCTURE & TOWER)
EAST CABLE ANCHORAGE "W" LINE LAYOUT NO.2

BRIDGE NO. 34-0006L/R
KILOMETER POST 13.2/13.9

R. Valizadeh/V. Toan/Y.L./W.L./F.C.
DESIGN OVERSIGHT
STN OFF DATE 01/04/13

100% P&E DATE PLOTTED => 04 JAN 2013 TIME PLOTTED => 09:57:42 USERNAME => DWInrow



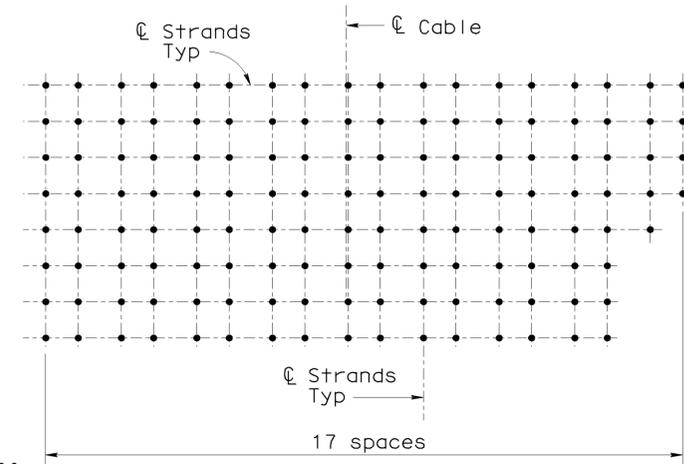
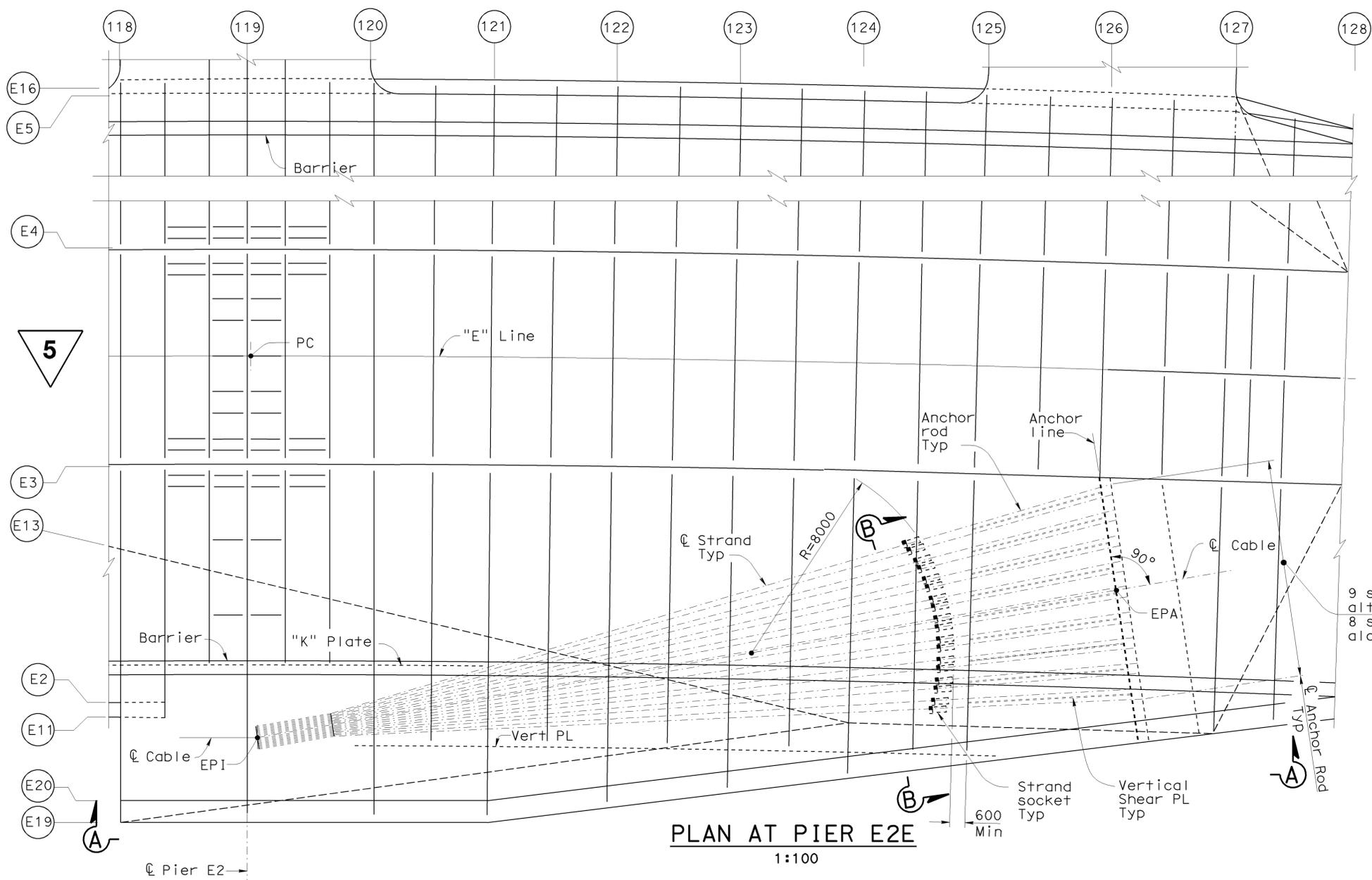
DIST.	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SF	80	13.2/13.9	731	1204

George Baker
REGISTERED ENGINEER - CIVIL
12-6-04
PLANS APPROVAL DATE

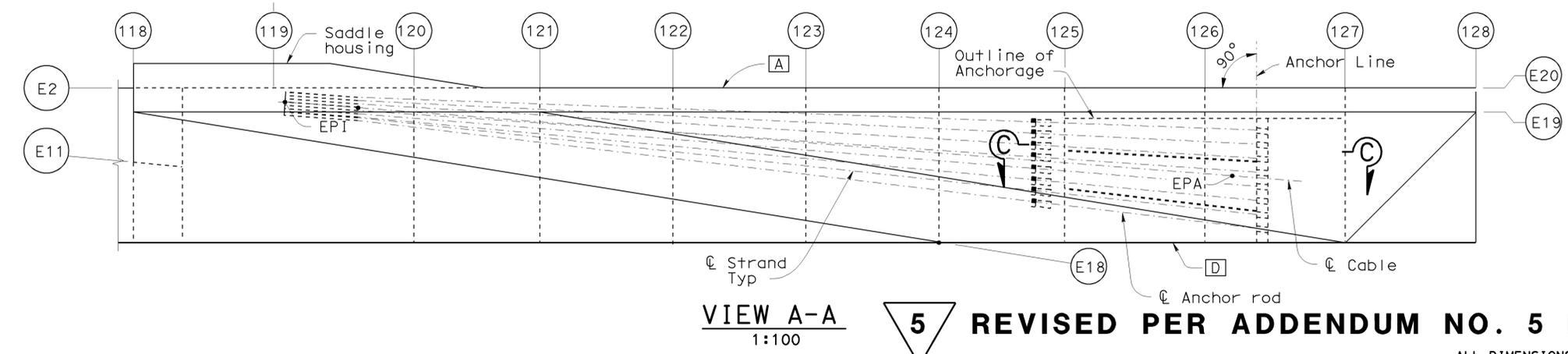
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825 BATTERY STREET
SAN FRANCISCO, CA 94111

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- NOTES:**
1. For EP1, EPA and cable geometry, see "Suspension Cable Layout" sheets and "East Saddle Details" sheets.
 2. The detailing of the anchor PL, the vertical shear plates, and their attachments are related to the cable geometry. The Contractor shall submit a layout of the cable anchorage to the Engineer for approval prior to producing shop drawings.
 3. For "East Cable Anchorage "E" Line Layout" sheets all bolts shall be detailed according to the bolt dimension table. see "Typical Girder Details No.1" sheet. All bolts are HS, unless noted otherwise.
 4. For "East Cable Anchorage "E" Line Layout" sheets unless noted otherwise all fillet welds shall be 6 mm for plate sizes not greater than 20 mm. For plates greater than 20 mm fillet welds shall be 8 mm unless noted otherwise.
 5. For Section C-C, see "East Cable Anchorage "E" Line Layout No.2" sheet.



5 REVISED PER ADDENDUM NO. 5 DATED DECEMBER 21, 2005

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN

R. Valizadeh/V. Toan/Y.L./W.L./F.C.
DESIGN OVERSIGHT
SIGN OFF DATE 12/07/05

DESIGN	BY G. Baker	CHECKED J. Kuliki
DETAILS	BY M. Gulyas	CHECKED T. McMeans
QUANTITIES	BY M. Gulyas	CHECKED M. Roberts

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DEPARTMENT OF TRANSPORTATION

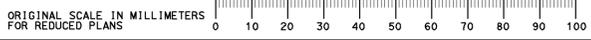
R. Manzanarez
PROJECT ENGINEER

BRIDGE NO.	34-0006L/R
KILOMETER POST	13.2/13.9

**SAN FRANCISCO OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT
SELF-ANCHORED SUSPENSION BRIDGE
(SUPERSTRUCTURE & TOWER)**

EAST CABLE ANCHORAGE "E" LINE LAYOUT NO.1

Rev. Date: 5-18-98



CU 04
EA 0120F1

DISREGARD PRINTS BEARING EARLIER REVISION DATES	REVISION DATES (PRELIMINARY STAGE ONLY)	SHEET	OF
	01/25/99 05/24/99 08/02/99 09/21/00 04/26/02 07/24/02 12/19/02 12/07/05	314	

100% P&S
TIME PLOTTED => 15-DEC-2005
USERNAME => rrtrendr DATE PLOTTED => 15-DEC-2005

DEPARTMENT OF TRANSPORTATION - District 4 Toll Bridge Program

333 Burma Rd.
Oakland, CA 94607
(510) 622-5660, (510) 286-0550 fax



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August 24, 2007

Contract No. 04-0120F4
04-SF-80-13.2 / 13.9
Self-Anchored Suspension Bridge
Letter No. 05.03.01-000487

Michael Flowers
Project Executive
American Bridge/Fluor Enterprises, a JV
375 Burma Road
Oakland, CA 94607

Dear Michael Flowers,

Department Audit of Dyson Corporation

The Department has reviewed ABF letter 257, dated August 14, 2007, and the "Corrective Action Request" from the Dyson Corporation, dated August 09, 2007. Based upon the information provided and in accordance with Special Provisions section 8-4, "Audits," the Dyson Corporation receives a "Pass" for the Department audit. This "Pass" applies only to the Dyson Corporation. Suppliers and subcontractors to the Dyson Corporation are subject to separate MFSQA reviews and audits. The following table summarizes the current status of associated audits:

Company	Letter No.	Date of Notice	MFSQA	AUDIT
AAA Galvanizing	321	06-18-2007	Approved	
Art Galvanizing	336	06-22-2007	Approved	
	403	07-25-2007		Contingent Pass
Central Testing Lab	320	06-18-2007	Approved	
	413	07-26-2007		Fail
Custom Industrial Processing	325	06-18-2007	Not Approved	
Industrial Coatings Inc	444	08-06-2007	Approved	
Mechanical Galv-Plating Corp	361	07-05-2007	Approved	
	432	08-02-2007		Pass
North American Galvanizing	337	06-22-2007	Approved	
	421	07-31-2007		Fail
Stork Herron Testing Lab	297	06-06-2007	Approved	
	417	07-30-2007		Contingent Pass
TC Industries	367	07-09-2007	Approved	
Tensile Testing Metallurgical Lab	296	06-06-2007	Approved	
	409	07-26-2007		Pass
Universal Galvanizing	338	06-25-2007	Approved	

The Contractor is reminded that work may not proceed at the facilities receiving a "Contingent Pass," until the outstanding issues detailed in the Department's letters have been addressed.

If you have any further questions, please contact Gary Lai at the Working Drawing Campus.

Sincerely,

A handwritten signature in blue ink that reads "Gary Purcell". The signature is written in a cursive, flowing style.

GARY PURSELL
Resident Engineer

cc: Rick Morrow
Mazen Wahbeh

file: 05.03.01, 55.0097

DEPARTMENT OF TRANSPORTATION - District 4 Toll Bridge Program

333 Burma Rd.
Oakland, CA 94607
(510) 622-5660, (510) 286-0550 fax



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July 09, 2008

Contract No. 04-0120F4
04-SF-80-13.2 / 13.9
Self-Anchored Suspension Bridge
Letter No. 05.03.01-002346

Michael Flowers
Project Executive
American Bridge/Fluor, A JV
375 Burma Road
Oakland, CA 94607

Dear Michael Flowers,

Submittal 674, Rev. 1 - Monnig MFSQA (Response to Audit Contingencies)

The Department has completed review of Submittal ABF-SUB-000674R01, "Monnig MFSQA," dated June 25, 2008, which contains the response to the audit contingencies in State Letter 05.03.01-002100. The submittal is "Approved," and Monnig Industries and Phoenix Manufacturing are receiving a Pass. It is acceptable for Monnig Industries to perform hot dip galvanizing of threaded anchor rods, with Phoenix Manufacturing performing abrasive blasting.

If you have any questions, please contact Dr. Venkatesh Iyer at (858) 967-6363.

Sincerely,

<<< ORIGINAL SIGNED >>>

GARY PURSELL
Resident Engineer

cc: Rick Morrow
Brian Boal
Gary Lai
Venkatesh Iyer
file: 05.03.01, 55.0674

DEPARTMENT OF TRANSPORTATION - District 4 Toll Bridge Program

333 Burma Rd.
Oakland, CA 94607
(510) 622-5660, (510) 286-0550 fax



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February 13, 2009

Contract No. 04-0120F4
04-SF-80-13.2 / 13.9
Self-Anchored Suspension Bridge
Letter No. 05.03.01-003481

Michael Flowers
Project Executive
American Bridge/Fluor, A JV
375 Burma Road
Oakland, CA 94607

Dear Michael Flowers,

Submittal 135, Rev. 3 – MFSQA for Stork Herron Testing Laboratory (SHTL)

The Department has completed review of Submittal ABF-SUB-000135R03, "MFSQA for Stork Herron Testing Laboratory," dated February 2, 2009. The submittal is "Approved."

Accordingly, SHTL has now passed the Department audit, and may perform NDT (MT) for the Dyson Corporation. However, the pass status of the audit is contingent on the fact that the Contractor has stated that SHTL will not perform any Liquid Penetrant Testing (PT) on the project. Please be aware of the comments provided below.

CATEGORY B:

1. Provide the certifications of the technicians SHTL will use to perform NDT (MT) testing. As previously notified in State Letter 05.03.01-002488, examination scoring must comply with the requirements of ASNT SNT-TC-1A, which requires that only the "Simple Average" method is used.
2. As previously notified in State Letter 05.03.01-002909, address the outstanding items outlined in State Letter 05.03.01-002488 if the Contractor wishes SHTL to perform PT on the project in the future.

If you have any questions, please contact Mohammad Fatemi at (916) 813-3677.

Sincerely,

<<< ORIGINAL SIGNED >>>

GARY PURSELL
Resident Engineer

cc: Rick Morrow; Brian Boal; Gary Lai; Mohammad Fatemi
file: 05.03.01, 55.0135

DEPARTMENT OF TRANSPORTATION - District 4 Toll Bridge Program

333 Burma Rd.

Oakland, CA 94607

(510) 622-5660, (510) 286-0550 fax



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July 14, 2008

Contract No. 04-0120F4

04-SF-80-13.2 / 13.9

Self-Anchored Suspension Bridge

Letter No. 05.03.01-002360

Michael Flowers
Project Executive
American Bridge/Fluor, A JV
375 Burma Road
Oakland, CA 94607

Dear Michael Flowers,

Quality Assurance Testing of Externally Threaded Fasteners

This letter is issued in response to renewed discussions at the Working Drawing Campus (WDC) and ABF-RFI-001233R04, concerning the Quality Assurance (QA) testing regimen of externally threaded fasteners, nuts and washers (fastener assemblies) for the SAS Project.

Initial discussions concerning the QA sampling requirements took place at the WDC in June 2007 and predominately concentrated on the QA sampling quantity for specialized and large diameter fastener assemblies used on the Cable System and the E2 Bearing and Shear Keys. A spreadsheet quantifying the sample size was provided at that time in draft format for discussion purposes only.

In addition, the Contractor was reminded at these meetings that QA testing of fastener assemblies will be performed pursuant to Standard Specification Section 6-1.01, "Source of Supply and Quality of Materials," and that the sample quantity, per heat, will be in accordance with Contract Special Provision Section 10-1.59, "Steel Structures," subsection "Bolted Connections," as shown below:

Lot Size (No. of Bolts)	Sample Size (No. of Bolts)
2 to 15	3
16 to 25	4
26 to 50	5
51 to 90	7
91 to 150	8
151 to 280	9
281 to 10,000	12
10,001 to 500,000	16
500,001 and over	20

AMERICAN BRIDGE/FLUOR, A JV

July 14, 2008

Page 2 of 2

The spreadsheet attached to this letter titled "*QA Sampling – Cable System/E2 Bearings & Shear Keys*," modifies the sample size provided above for some of the Cable System and E2 Bearing and Shear Key fastener assemblies. Please provide test samples in accordance with the attachment.

Please contact Brian Boal at (510) 622-5191 should you have any questions.

Sincerely,



GARY PURSELL
Resident Engineer

Attachment

cc: Rick Morrow
Brian Boal
Mark Woods
Gary Lai
Venkatesh Iyer
Ryan Smith
file: 05.03.01

QA Sampling - Cable System/E2 Bearings & Shear Keys

Description	Size	Material & Grade	Coating	Dwg Quantity Required	Spare Fasteners	Finished Item (Notes 10, 11, 12)	Material Only (Notes 10 & 13)	Comments
Cable Band Bolts	51mm dia x 6.10	A354-BC	HD Galv	1260	20	5	0	30 Bolts are required in addition to those listed in the table per Section 10-1.60 Cable System, for tensile testing & load extension curves
Cable Band Bolts	51mm dia x 7.10	A354-BC	HD Galv	48	T.B.D. by ABF	1	0	
Cable Band Anchor Rods	75mm dia x ###	A354-BD	HD Galv	24	T.B.D. by ABF	1	2	In all cases, three (3) samples per heat are required. At the Contractor's option, 3 full size finished items may be furnished.
Tower Saddle Tie Rods	4" dia x ###	A354-BD	HD Galv	24	T.B.D. by ABF	1	2	In all cases, three (3) samples per heat are required. At the Contractor's option, 3 full size finished items may be furnished.
East Saddle Tie Rods	3" dia x ***	A354-BD	HD Galv	18	T.B.D. by ABF	1	2	In all cases, three (3) samples per heat are required. At the Contractor's option, 3 full size finished items may be furnished.
East Saddle Anchor Rods	50mm dia x ***	A354-BD	HD Galv	32	T.B.D. by ABF	1	2	In all cases, three (3) samples per heat are required. At the Contractor's option, 3 full size finished items may be furnished.
West Saddle Anchor Rods	1.75" dia x ***	A354-BC	HD Galv	42	T.B.D. by ABF	1	2	In all cases, three (3) samples per heat are required. At the Contractor's option, 3 full size finished items may be furnished.
West Deviation Saddle Anchor Rods	50mm dia x ***	A354-BC	HD Galv	168	T.B.D. by ABF	1	2	In all cases, three (3) samples per heat are required. At the Contractor's option, 3 full size finished items may be furnished.
Jacking Saddle Tie Rods	1.5" dia x ***	A354-BC	HD Galv	8	T.B.D. by ABF	1	2	In all cases, three (3) samples per heat are required. At the Contractor's option, 3 full size finished items may be furnished.
Suspender Socket Anchor Rods - Type I	90mm dia x ***	A354-BC	HD Galv	352	T.B.D. by ABF	1	2	In all cases, three (3) samples per heat are required. At the Contractor's option, 3 full size finished items may be furnished.
Suspender Socket Anchor Rods - Type II	100mm dia x ***	A354-BC	HD Galv	48	T.B.D. by ABF	1	2	In all cases, three (3) samples per heat are required. At the Contractor's option, 3 full size finished items may be furnished.
Tower Suspender Anchor Rod	90mm dia x ***	A354-BC	HD Galv	16	T.B.D. by ABF	Included with Type I Suspender		
E2 Shear Key	76mm dia x ***	A354-BD	HD Galv	192	T.B.D. by ABF	1	2	In all cases, three (3) samples per heat are required. At the Contractor's option, 3 full size finished items may be furnished.
E2 Shear Key	76mm dia x ***	A354-BD	HD Galv	336	T.B.D. by ABF	1	2	In all cases, three (3) samples per heat are required. At the Contractor's option, 3 full size finished items may be furnished.
E2 Bearing	76mm dia x ***	A354-BD	HD Galv	96	T.B.D. by ABF	1	2	In all cases, three (3) samples per heat are required. At the Contractor's option, 3 full size finished items may be furnished.
E2 Bearing	50mm dia x ***	A354-BD	HD Galv	224	T.B.D. by ABF	1	2	In all cases, three (3) samples per heat are required. At the Contractor's option, 3 full size finished items may be furnished.
Main Cable Anchor Rods	90mm dia x ###	A354-BD	HD Galv	274	T.B.D. by ABF	1	2	In all cases, three (3) samples per heat are required. At the Contractor's option, 3 full size finished items may be furnished.

Notes/Legend:

- 1) Quantities for testing are per Lot. (Lot implies same diameter, length, heat, as well as heat treatment batch)
- 2) The number of samples indicated will be for Caltrans Lab testing.
- 3) Quantities listed do not take into account re-testing criteria due to failure
- 4) This list is NOT all inclusive. Items not listed are to follow the sampling size table in Section 10-1.59 "Steel Structures" of the Contract Special Provisions
- 5) ### = Fastener length varies; length to be determined by ABF's Means & Methods; *** = Fastener diameter will be determined by ABF's Means & Methods
- 6) A354 does not have metric equivalent. All Fastener diameters will be in imperial. Those shown in imperial were requested in RFI #278R0 & #281R1. Contract Plans - General Note allows for size substitution as clarified in RFI #65R0
- 7) ASTM A354 requires that the number of tests conform to ASTM F1470 and performed in accordance with ASTM F606
- 8) Number of tests/requirements for ASTM F1470 not shown
- 9) Quantities assume that no ROCAP testing required
- 10) Quantities provided are ONLY applicable if manufacturer passes Department Audit
- 11) Finished items shall be fabricated full-size; the Engineer will select one at random, and the fabricator may send to Trans Lab either this sample OR a 1200 mm length cut from a threaded end of the sample.
- 12) Each Finished item sample shall include the same number of washers, nuts, or similar components that will accompany an item's field installation.
- 13) "Material Only" denotes a sample 300 mm in length (minimum) which need not be threaded; it shall be from the same rod stock/heat treatment lots as the finished product.

REQUEST FOR INFORMATION (RFI)

RFI No.: ABF-RFI-001233R04 Submitted By: Gatsos, Levi Pages: 1
 RFI Date: 23-June-2008 Contact Name: Kick, Robert Pages Attached: 0
 Phone No. (510) 808-4571

Subject: E2 Bearing and Shear Key Anchor Rod Spherical Washers	
References:	
Sub/Sup: <u>DYS</u>	Sub RFI #:
Response Required by: <u>24-June-2008</u>	Response affects critical path activity? <u>Yes</u>

Description:

Per WDC discussions, ABF understands the following;

1. The Proof Test Rod Assemblies are not required to be a part of a permanent heat treatment lot and that the heat treatment and galvanizing can be performed at any facility as long as it is in conformance with the contract requirements. Please confirm.
2. Caltrans would like additional QA samples to be provided for each heat treatment lot of E-2 Bearing and Shear Key Rods. Please provide details and quantity of additional samples per rod heat treatment lot.

Contractor Disposition:

This RFI is being submitted for:

The Cost and Time Impact from this RFI is: Cost and/or time impacts in the performance of our Work will result.

Response:

Agreed Ext. Due Date:

Pages: 1
Pages Attached: 0

- 1) Contractor's proposal is acceptable.
- 2) For QA testing, the Contractor shall provide the following for each heat treated lot:
 - 3 – Nuts, washers, and plates
 - 1 – Test rod sample threaded 300mm on each end. Min.length of 1200mm
 - 2 – Material rod sample with minimum length of 300mm

The Department will issue a forthcoming letter clarifying QA sampling quantities for the job.

Administrative Action:

This response resolves the RFI.

Date: <u>25-June-2008</u>	Respondent: <u>Matin, Ron</u>	Phone No.: <u>510-808-4611</u>
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STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION
NOTICE OF MATERIALS TO BE USED
 CEM-3101 (REV 05/2006) C/T# 7541-3511-1

ADA Notice

For individuals with sensory disabilities, this document is available in alternate formats. For information call (916) 654-6410 or TDD (916) 654-3880 or write Records and Forms Management, 1120 N Street, MS-89, Sacramento, CA 95814.

To (Resident Engineer): Gary Russell Date: 10/13/08
 You are hereby notified that materials required for use under Contract Number (1) 04-0120FY
 Dist. 04 Co. San Francisco Rte. 80 P.M. 13.2/13.9
 will be obtained from the following sources:

Contract Bid Item Number (2)	Item Code (3)	Contract Item Description (4)	Item Component (5)	Item Sub-Component (5)	Manufacturer/Provider Name(s) and Address(es) (6)
606	049326	Furnish PWS Cable System	Cable Band	PWS Anchor Rods + Hardware - NOT Test Pieces	Tne Dyson Corp. 53 Freedom Rd. Painsville, OH 44077

It is requested that you arrange for sampling, testing and inspection of materials prior to delivery in accordance with Section 6 of the Standard Specifications. It is understood that source inspection does not relieve the prime contractor of the full responsibility for incorporating into the work, materials that comply in all respects with the contract plans and specifications. Nor does it preclude the subsequent rejection of materials found to be unsuitable.

Yours Truly,
 Contractor
 American Bridge / Fluor, JV
 Address
 375 Burma Road, Oakland CA 94607
 Business Phone
 510.808.4600
 Business Fax
 510.808.4631
 E-Mail Address

(7) c: Materials Administrator, Mail Station #5
 Materials Engineering & Testing Services
 5900 Folsom Blvd, Sacramento, CA 95819
 Fax: (916) 227-7084
 Construction Senior Engineer
 Contractor File
 District Construction Office

DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES

Office of Structural Materials

Quality Assurance and Source Inspection



Bay Area Branch
 690 Walnut Ave. St. 150
 Vallejo, CA 94592-1133
 (707) 649-5453
 (707) 649-5493

Contract #: 04-0120F4Cty: SF/ALA Rte: 80 PM: 13.2/13.9File #: 1.7**NOTICE OF MATERIALS TO BE FURNISHED**

To: The Dyson Corporation
 53 Freedom Road
 Painsville, OH 44077

Report No: NMF-000053**Date:** 20-Oct-2008

Contractor: American Bridge/Fluor Enterprises, a JV
 375 Burma Road
 Oakland, Ca 94607

Resident Engineer: Pursell, Gary**Address:** 333 Burma Road**City:** Oakland, CA 94607

The above contractor has notified this department that your firm is to furnish the following materials:

Bid Item #	Material Description
66	FURNISH PWS CABLE SYSTEM - CABLE BAND - PWS ANCHOR RODS & HARDWARE - NDT TEST PIECES

In accordance with Section 6-1.01 of the California Department of Transportation Standard Specifications, this material is subject to our inspection and release before shipment is made. Please notify this office as soon as manufacture or fabrication is proposed or as soon as sampling is required, Sampling, tests, and inspection will be made in accordance with Section 6 of the Standard Specifications.

Source inspection is random and does not relieve the contractor of the full responsibility of incorporating materials in the work that comply in all respects with the contract plans and specifications, nor does it preclude the subsequent rejection of materials found to be unsuitable.

Material shipped without proper release shall constitute sufficient reason for rejection.

Please fax the attached Inspection Request Form back to the designated Quality Assurance and Source Inspection Branch. This office must receive the request with sufficient time to complete testing or sampling prior to shipment. Your cooperation in this matter is greatly appreciated.

Sincerely,

Iyer, Venkatesh
 Structural Materials Representative

REQUEST FOR INFORMATION (RFI)

RFI No.: ABF-RFI-001631R00 Submitted By: Hester, Daniel Pages: 8
 RFI Date: 05-February-2009 Contact Name: Sheffield, Pat Phone No.
 Pages Attached: 7

Subject: Heat Treatment of A354 Grade BD Material	
References:	
Sub/Sup: DYS	Sub RFI #:
Response Required by: 12-February-2009	Response affects critical path activity?

Description:

ABFJV's supplier (The Dyson Corporation) is in the process of procuring ASTM A354 Grade BD material for use on the project. The mill that Dyson is proposing to use for the material (Gerdau-Ameristeel) is also capable of performing the requisite heat treatment and their own facility (Gerdau-Macsteel). The proposed heat treating facility operates a continuous quench & temper line using induction heating technology. Dyson proposes to procure "fully upgraded" materials from Gerdau-Ameristeel in the quenched & tempered condition in accordance with the contract requirements (ASTM A354 Gr. BD). Consequently, Dyson has the following questions:

1. It is understood that an audit would not be required of the mill/heat treatment facility. Please verify Dyson's understanding.
2. Unlike other facilities, Gerdau-Macsteel heat treating operation is "truly continuous". What would be considered as the heat treat "lot size" for mechanical testing purposes?

Please see the attached for information on the heat treatment facility.

Contractor Disposition:

This RFI is being submitted for:

The Cost and Time Impact from this RFI is: Not selected

Response:	Agreed Ext. Due Date:
	Pages: 1
	Pages Attached: 0

1. Correct, an audit is not required for this mill/heat treatment facility.
2. With the information provided by Gerdau-Macsteel, the heat treatment run would be considered one lot, unless the following occurred during heat treatment:
 - A. An interruption in heat treatment operations,
 - B. The end of a shift or a personnel change,
 - C. A change in the material mill heat.

Administrative Action:

This response resolves the RFI.

Date: 12-February-2009	Respondent: Brignano, Bob	Phone No.: 510-286-0503
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Quench and Temper production lines #1 and #2.

QUENCH AND TEMPER AT IT'S FINEST

The Heat Treating Division of MACSTEEL had its beginnings nearly twenty-five years ago as a "greenfield" operation in Huntington, Indiana. The location was selected for its proximity to major customer bases and it allowed ample room for future expansion. MACSTEEL engineering carefully analyzed available manufacturing processes then "re-engineered" additional capabilities. The resulting unique quench and temper line was able to achieve the following results:

- 1 Straightness deviations of less than 0.030 inch per 3 ft. of tubing material and 0.125" per 5 ft. of bar material.**
- 2 Rockwell C hardness uniformity of less than 4 points.**
- 3 One-half commercial heat treat tolerances as cited by the (ASTM) American Society Testing and Materials in its A519 specification.**

Today, MACSTEEL's Heat Treating Division has three full quench and temper lines coupled with a host of value-added services. Operators are highly skilled and undergo continual technical training that exceeds typical industry practice. With nearly a quarter century of experience MACSTEEL has taken heat treating from an art to a science.

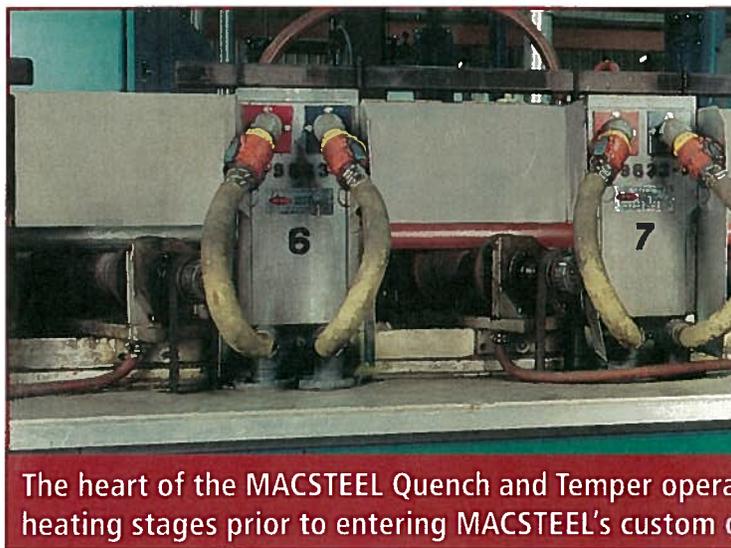
Quench and Temper production line #3.



WHY MACSTEEL HEAT TREATING?

The Heat Treating Division of MACSTEEL is a complete state-of-the-art facility specializing in technically advanced induction heating for long length bars and tubes.

Value-added support equipment for customized cutting, straightening, tensile testing and metallographic analysis are part of what this unique facility has to offer. Another distinctive attribute of this facility is that it can accommodate long bar from 12 to 35 ft. and tube product from 12 to 60 ft. in length. Customers receive the added benefit of single-source responsibility with an array of technical expertise and support that goes through the complete ranks of MACSTEEL in all their world class production facilities. MACSTEEL is recognized for its state-of-the-art metallurgical services and highly experienced product development support.



The heart of the MACSTEEL Quench and Temper operation is the induction heating stages prior to entering MACSTEEL's custom quench tanks.

THE REAL ADVANTAGE OF INDUCTION HEATING FROM MACSTEEL

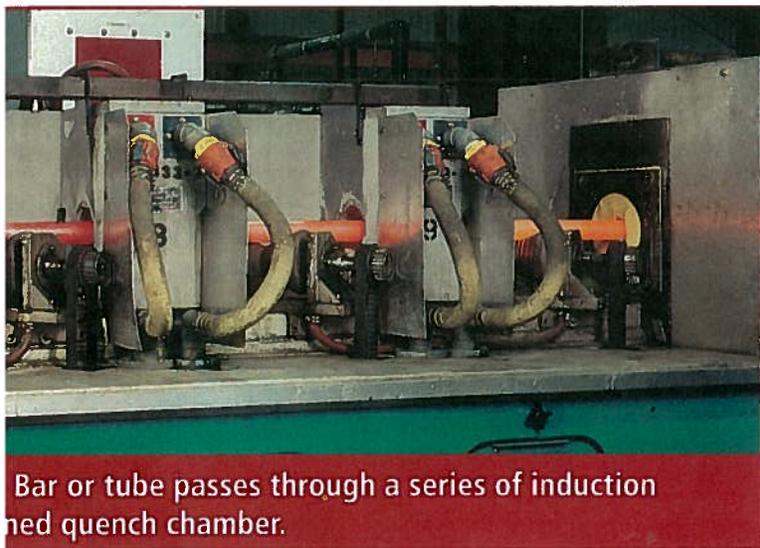
- ONE PIECE AT A TIME**
 Each bar or tube is individually heat treated, ONE BAR AT A TIME. This is better than "batch" heat treating.
- UNIFORM HEATING**
 Each rotating bar or tube is uniformly heated to a precise temperature through computer controlled induction coils.
- INDIVIDUAL BAR & TUBE QUENCHING**
 Every bar or tube is individually quenched through a proprietary quench process that achieves optimum transformation kinetics.
- SUPERIOR STRAIGHTNESS**
 Rotation of individual bars or tubes through the spray quench leads to superior straightness.

THE STEEL HEAT TREATING PROCESS

Individually, every bar or tube is processed through precision controlled induction heating coils to the optimum hardening temperature. The next step is a proprietary quench that achieves the highest quench factor for the most complete transformation. Induction tempering then provides a uniform structure to meet your strength and hardness requirements.

Full length heat treating of bar and tubing enables MACSTEEL customers to machine distortion-free parts, eliminate production processes and save money.

This is really the essence of what makes MACSTEEL's Heat Treating Division unique and special in today's market place.

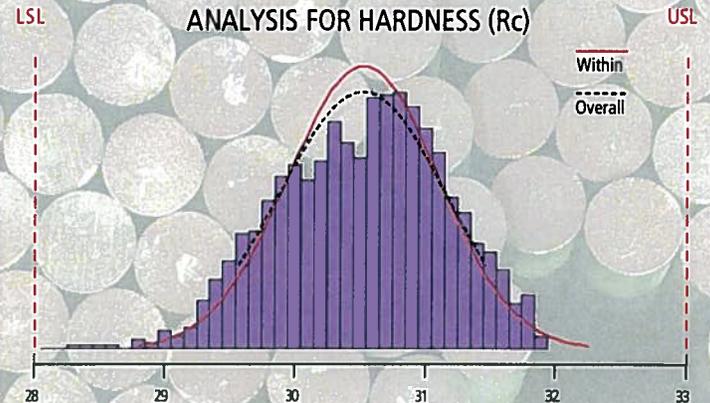


Bar or tube passes through a series of induction heated quench chamber.

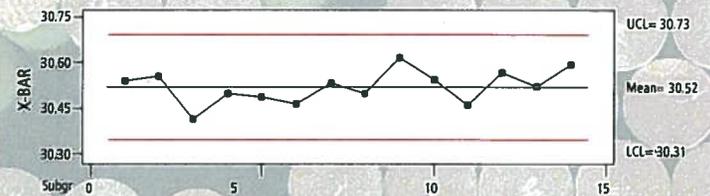
MACSTEEL Heat Treating Division PROCESS CAPABILITY

(Grade 4145, 1.062" diameter)

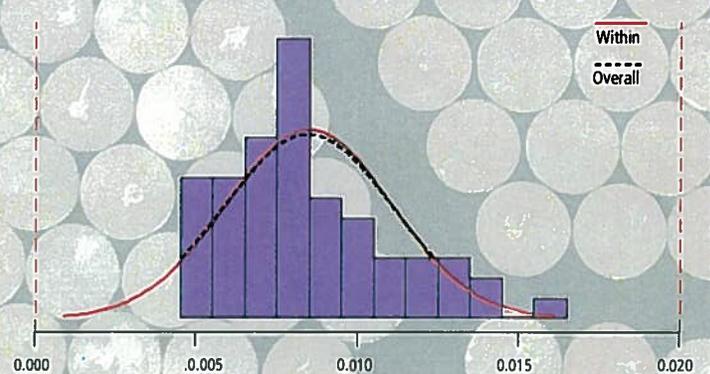
ANALYSIS FOR HARDNESS (Rc)



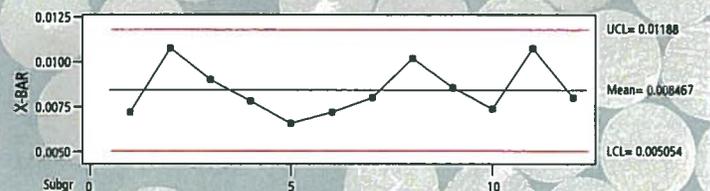
Process Data		Potential (Within) Capability	
USL	33.0000	Cp	2.88
Target	*	CPU	2.86
LSL	28.0000	CPL	2.91
Mean	30.5201	Cpk	2.86
Sample N	1357		
StDev (Within)	0.578314		
StDev (Overall)	0.635911		



ANALYSIS FOR BAR STRAIGHTNESS (TIR)



Process Data		Potential (Within) Capability	
USL	0.0200000	Cp	2.62
Target	*	CPU	3.02
LSL	0.0000000	CPL	2.22
Mean	0.0084667	Cpk	2.22
Sample N	60		
StDev (Within)	0.0025437		
StDev (Overall)	0.0026113		



QUENCH AND TEMPER (Q&T) MACSTEEL

■ STRENGTH AND TOUGHNESS

Each bar and tube transforms to a martensitic structure that is tempered in line to the desired strength and toughness.

■ UNIFORM HARDNESS

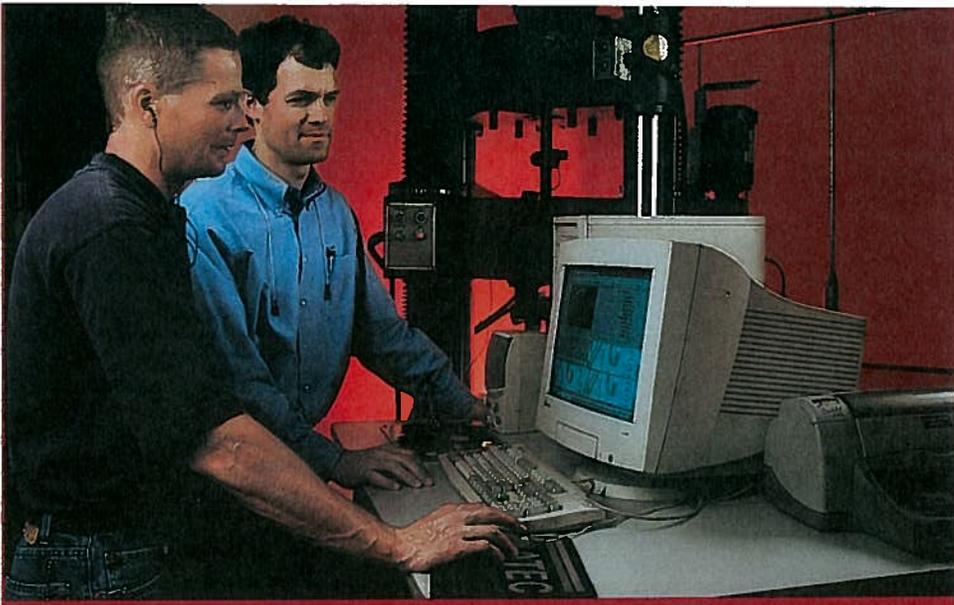
Every bar and tube has uniform hardness end-to-end, piece-to-piece and order-to-order.

■ STRESS FREE & DECARB FREE

Each bar and tube is STRESS FREE, decarb free and ready for your critical part applications.

■ VALUE-ADDED SERVICES

Orders can be CUSTOM CUT (saw or plasma) for specific product applications along with a host of other available services.



Production Bay #3 Tensile Testing Facility.



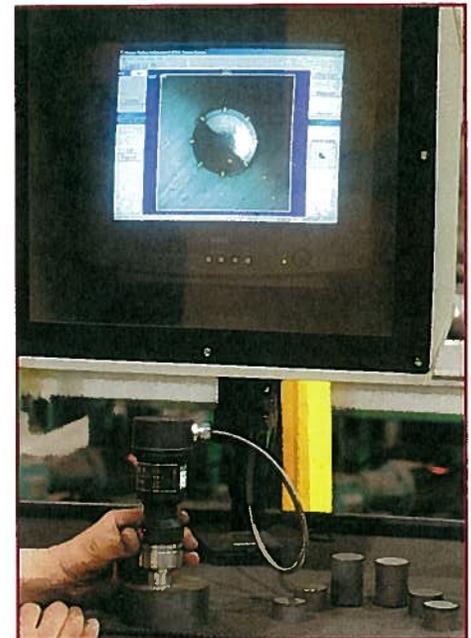
Rockwell Hardness Testing.

QUALITY, CONSISTENCY, DEPENDABILITY

MACSTEEL takes great pride in the quality of its products and in the consistency in which they are delivered. Quality control measures are routine throughout our entire quench and temper process assuring you a reliable product with no need for additionally stress relieving. Also, when MACSTEEL is specified for the raw material as well, you can count on a **stress free and decarb free** product. In any production process a "consistent" quality material is what puts dollars on the bottom line. And that's exactly what you get from the MACSTEEL Heat Treating Division.

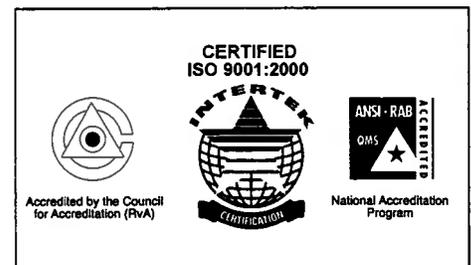
ASK FOR THE MACSTEEL EXPERTS

Let us help you discover new ways to save on your application with a heat treated product. Our people are ready and eager to help you right from the initial design all the way through the production process. Heat treating before machining is a perfect way for you to machine distortion-free parts and eliminate several production steps, thereby saving bottom-line dollars. Test our capabilities. We're ready to work with you from concept to reality. From long-run OEM contract orders to Steel Service Center conversion work, MACSTEEL Heat Treating Division is ready, willing and more than able.



Brinell Hardness Testing.

Bar exiting MACSTEEL's proprietary quenching chamber.



SPECIFICATIONS/CAPABILITIES

GRADES TREATED

- All heat treatable grades of carbon, alloy, and stainless steels.

HEAT TREATMENTS

- Quench & Temper
- Thru-hardening
- Surface hardening
- Normalizing
- Stress Relief Annealing

BAR PRODUCTS

- Hot Finished or Cold Finished
- Size range—0.875" to 4.125"
- Hex Shape (Inquire)

TUBULAR PRODUCTS

- Welded or DOM
- Hot Finished Seamless
- Cold Drawn Seamless
- Size range—0.75" to 6.25" O.D.

LENGTH CAPACITY

- BAR—12 ft. to 35 ft.
- TUBE—12 ft. to 60 ft.
- Max. weight per piece—2000 lb.

STRAIGHTNESS TOLERANCES

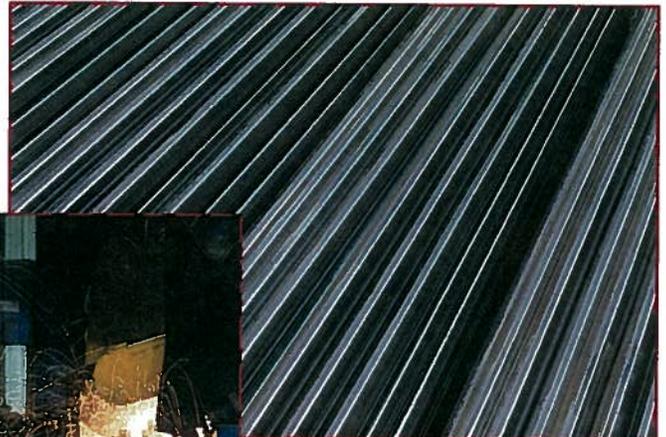
- BAR—0.125" per 5 ft.
- TUBE—0.030" per 3 ft.

CUTTING

- Close tolerance custom cutting...saw and plasma
- Cut to length for product applications

OTHER VALUE-ADDED SERVICES

- Demagnetization
- Chamfering
- Metallurgical support
- Complete traceability
- Complete test reports
- Small quantities available
- Hex bundling
- Stenciling/color coding
- Experimental or trial orders encouraged
- Short lead times
- On-time, all-the-time delivery
- Overseas packaging



CONSISTENT QUALITY



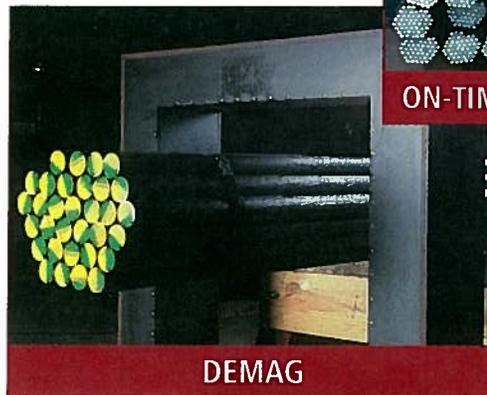
CUSTOM CUTTING



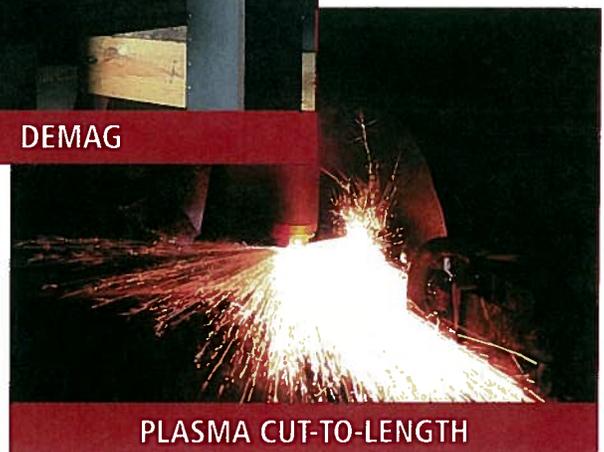
PRECISION QUENCH & TEMPER LINE #3



ON-TIME ALL-THE-TIME DELIVERY



DEMAG

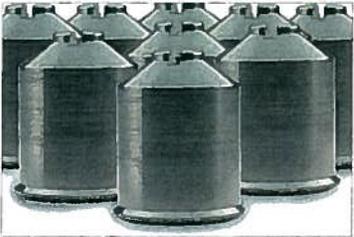


PLASMA CUT-TO-LENGTH

TYPICAL APPLICATIONS



- Automotive drivetrains & suspensions
- Automotive safety appliances
- Axle tubing
- Bolting stock
- Motor shafting
- Off-road equipment
- OCTG high pressure casing & tubing
- Oil country accessories



- Construction equipment
- Crane booms
- Farm equipment machinery
- Gun barrels
- King pins
- Machinery
- Perforator guns
- Screw machine parts
- Stabilizer bars
- Torsion bars
- Truck & Trailers



GO GERDAU MACSTEEL
HEAT TREAT

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www.gerdaumacsteel.com

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 MSI 0903-5M Printed in U.S.A.



25 Commercial Road
Huntington, IN 46750
(219) 356-9520
Direct (219) 355-2202
Fax (219) 356-9522
Dmelchi@Gerdaumacsteel.com

February 5, 2009

Dyson Corp.
Attn: Mr. Pat Sheffield
53 Freedom Road
Painesville, OH 44077

Subject: Single bar processing vs. batch processing

Dear Mr. Sheffield:

Thank you for allowing me to give a brief overview of our Induction quench and temper heat treating lines. We will receive your material/order for processing at our facility in Huntington Indiana. Your material will be assigned a unique mill order number for our internal tracking. The material will then be run when it is received "complete".

Material is placed on the inlet table and the line is adjusted appropriately for the material size. A three piece sample run will be made and the material qualified for hardness and mechanical properties. After qualifications process is completed we will run the order in its entirety. The material will be run in a bale for bale fashion to maintain traceability. The bars will be processed one-after-another for the entire order. No separate batches will be made or will be distinguishable. In-process checks will be made at the front, middle and back of the material run to validate material specifications. A material sample will be procured for submission to an outside laboratory for any Charpy Impact testing requirements. Material will exit the line and drop into an exit bunk. The material bales will be taken to the finishing operation for further work.

The induction heat treat line consists of 9-18 induction coils for austenitizing. The induction equipment is a minimum of a 1 MWatt unit operating at a nominal 3 KHz. The material is conveyed individually through the coils on skewed rolls for uniform heating and adequate support. The material is butted together on the roll conveyor to provide for uninterrupted heating. The temperature of the material is measured using an infrared pyrometer and recorded for traceability to the order.

The material moves into a robust water quench for superior transformation into martensite. The high pressure spray system is applied to each individual bar in a uniform matter. Each bar sees the same quenching as the material is conveyed through the quench. The uniform quenching is what produces outstanding straightness control.

The Tempering of the bar is then carried out on the bar with the use of induction coils. The individual bars are conveyed through 7-14 induction coils from an 850kWatt inverter operating at a nominal 1 KHz. The material continues to be conveyed on skewed rolls with precision speed control. The tempering temperature is monitored with pyrometers.

Quench and tempered material is rolled off the line onto a cooling table where the material can cool in air. A chain drive will index material across the table. The material will finally exit into a bunk.

The finishing operation will trim two inches of material from each end of the bar. The direct bar ends are harder due to some heat loss during tempering. The cut bars will be chamfered and placed on an inspection table. Each individual bar will be checked for straightness, size. Steel stamping identification of the heat number and any color coding necessary will be applied. Material is tallied and packed for shipment.

If you have any questions or comments, please feel free to contact me on this matter.

Sincerely,

Doug Melchi
Metallurgist

DEPARTMENT OF TRANSPORTATION - District 4 Toll Bridge Program

333 Burma Rd.
Oakland, CA 94607
(510) 622-5660, (510) 286-0550 fax



*Flex your power
Be energy efficient!*

October 31, 2008

Contract No. 04-0120F4
04-SF-80-13.2 / 13.9
Self-Anchored Suspension Bridge
Letter No. 05.03.01-002906

Michael Flowers
Project Executive
American Bridge/Fluor, A JV
375 Burma Road
Oakland, CA 94607

Dear Michael Flowers,

Authority to Proceed – CCO 91 - Additional Magnetic Particle Testing of Anchor Rods/Bolts

In accordance with Section 4-1.03, "Extra Work," of the Standard Specifications, ABF is directed to perform additional Magnetic Particle Testing (MT) in accordance with ASTM specification A490, on cable bracket anchor rods, main cable anchor rods and other ASTM 354, Grade BD anchor rods and bolts to be tensioned in excess of 0.5Fu. This additional work will be covered under Contract Change Order (CCO) No. 91.

The items requiring additional MT include the following:

1. East Saddle tie rod
2. Pier E2 Shear Key - anchor rods connecting stub to the E2 concrete cross beam
3. Pier E2 Shear Key - anchor bolts connecting OBG with shear key housing
4. Spherical Bushing Bearings (Pier E2) - anchor rods connecting hold down to E2 concrete cross beam
5. Spherical Bushing Bearings (Pier E2) - anchor bolts to OBG
6. Spherical Bushing Bearings (Pier E2) -Spherical bushing assembly bolts
7. Cable bracket anchor rods
8. Main Cable anchor rods

Please contact Brian Boal at 510-622-5191 if you have any questions.

Sincerely,


for GARY PURSELL
Resident Engineer

cc: Rick Morrow, Brian Boal, Gary Lai, Scott Fabel, Jinesh Mehta
file: 05.03.01, 49.091

REQUEST FOR INFORMATION (RFI)

RFI No.: ABF-RFI-001741R00 Submitted By: Smith, Kevin Pages: 2
 RFI Date: 24-April-2009 Contact Name: Smith, Kevin Phone No. (412) 631-1000
 Pages Attached: 0

Subject: CCO 91 Clarification	
References:	
Sub/Sup: ABF	Sub RFI #:
Response Required by: 01-May-2009	Response affects critical path activity?

Description:

ABF has received several questions and RFI 's from our subcontractors and suppliers concerning the Departments direction to perform additional Magnetic Particle Testing (MT) of ASTM A354 rods in Department letter No. 2906 . How is ABF supposed to determine which materials require the additional MT testing?

Method A. Review all the Contract Documents and perform the MT testing on all anchor rods and bolts that are ASTM A354, Grade BD and are to be tensioned in excess of 0.5Fu.

Method B. Only perform the testing on the items specifically listed below:

1. East Saddle tie rod
2. Pier E2 Shear Key - anchor rods connecting stub to the E2 concrete cross beam
3. Pier E2 Shear Key - anchor bolts connecting OBG with shear key housing
4. Spherical Bushing Bearings (Pier E2) - anchor rods connecting hold down to E2 concrete cross beam
5. Spherical Bushing Bearings (Pier E2) - anchor bolts to OBG
6. Spherical Bushing Bearings (Pier E2) -Spherical bushing assembly bolts
7. Cable bracket anchor rods
8. Main Cable anchor rods

Method C. Provide MT testing on all items that either meet the criteria in "Method A" above or are listed in "Method B" above.

Please review and advise.

Contractor Disposition:

This RFI is being submitted for:

The Cost and Time Impact from this RFI is: Not selected

Response:

Agreed Ext. Due Date:

Pages: 2
 Pages Attached: 0

Use "Method C" to determine MT testing of ASTM A354 Gr. BD Fasteners.

REQUEST FOR INFORMATION (RFI)

Please note that the Tower Saddle Tie Rods must also be MT tested as informed in the response to ABF-RFI-001735R00. This component was inadvertently omitted from the fasteners listed in State Letter 05.03.01-002906.

Administrative Action:

This response resolves the RFI.

Date: 06-May-2009	Respondent: Collins, Warren	Phone No.: 510-622-5661
--------------------------	------------------------------------	--------------------------------

REQUEST FOR INFORMATION (RFI)

RFI No.: ABF-RFI-001741R01 Submitted By: Smith, Kevin Pages: 2
 RFI Date: 22-May-2009 Contact Name: Gatsos, Levi Phone No. 510-808-4600
 Pages Attached: 0

Subject: CCO 91 Clarification	
References:	
Sub/Sup: ABF	Sub RFI #:
Response Required by: 29-May-2009	Response affects critical path activity?

Description:

Per the department's response to ABF-RFI-001741R00, ABF understands the following:

A. Complete List of Rods to be covered under CCO 91

1. East Saddle tie rod
2. Pier E2 Shear Key - anchor rods connecting stub to the E2 concrete cross beam, with the exception of the E2 Shear Key rods located over the Pier E2 Columns which were procured prior to the issuing of CCO 91.
3. Pier E2 Shear Key - anchor bolts connecting OBG with shear key housing
4. Spherical Bushing Bearings (Pier E2) - anchor rods connecting hold down to E2 concrete cross beam
5. Spherical Bushing Bearings (Pier E2) - anchor bolts to OBG
6. Spherical Bushing Bearings (Pier E2) -Spherical bushing assembly bolts
7. Cable bracket anchor rods
8. Main Cable anchor rods
9. Tower Saddle Tie Rods

Please confirm that the above list contains all rods that require additional MT testing per CCO 91.

B.

The Tower Saddle Turned Rods have a required final tension of $0.45*F_u$, however to achieve this final tension the Tower Saddle Turned Rods will be temporarily tensioned in excess of $0.5*F_u$. ABF understands the intent of CCO 91 is to test ASTM A354 Grade BD Rods having a required final tension in excess of $0.5*F_u$, therefore ABF has excluded the Tower Saddle Turned Rods from the above list. Please confirm that the Tower Saddle Turned Rods do not require additional MT testing.

Contractor Disposition:

This RFI is being submitted for:

The Cost and Time Impact from this RFI is: Not selected

Response:

Agreed Ext. Due Date:

Pages: 2
 Pages Attached: 0

A: The list appears to be complete. We are not aware of any other A 354 Gr. BD fasteners requiring MT per CCO No. 91.

B: Confirmed, Tower Saddle turned Rods do not require MT testing.

Administrative Action:

This response resolves the RFI.

REQUEST FOR INFORMATION (RFI)

Date: 04-June-2009	Respondent: Collins, Warren	Phone No.: 510-622-5661
---------------------------	------------------------------------	--------------------------------

REQUEST FOR INFORMATION (RFI)

RFI No.: ABF-RFI-001739R00 Submitted By: Baltzer, Karsten Pages: 2
 RFI Date: 23-April-2009 Contact Name: Baltzer, Karsten Phone No. 510-808-4598
 Pages Attached: 1

Subject: Cable - PWS Rods for testing by Caltrans supplied by Dyson

References:

Sub/Sup: DYS **Sub RFI #:**

Response Required by: 30-April-2009 **Response affects critical path activity?** No

Description:

From Department Letter No. 05.03.01-2360 it is ABFJV's understanding that the Department's request regarding the PWS Rods for testing are as follows. (attachment)

The additional quantity is base on the assumption that all rods in one lot must have the same length. However if different lengths are permitted in one lot the additional quantity will be reduced significantly.

Please consider allowing different lengths in one lot?

Please review and instruct.

Contractor Disposition:

This RFI is being submitted for:

The Cost and Time Impact from this RFI is: Not selected

Response:

Agreed Ext. Due Date:

Pages: 2
Pages Attached: 1

For the PWS Rods, length will not be considered a factor in the determination of a 'Lot' size. The Contractor is reminded that two (2) 'Material' samples per 'Lot' are required in addition to the 'Finished' rod for QA testing, as stated in the attachment to State Letter 05.03.01-002360.

The 'Finished' sample may be provided by one of the following:

- a: A completed PWS Rod.
- b: A 1200mm sample cut from the threaded end of the PWS Rod – Note: It is acceptable to make the PWS Rod 1200mm longer than the finished item so that it can be used in the permanent work, upon acceptable test results after the sample is removed.
- c: A sample that meets the criteria provided in ABF-RFI-001233R04 (1200mm long with 300mm of thread on each end).

Administrative Action:

This response resolves the RFI.

Date: 01-May-2009	Respondent: Collins, Warren	Phone No.: 510-622-5661
--------------------------	------------------------------------	--------------------------------

Testing: PWS Rods

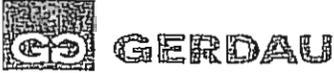
Description	Required Quantity	Additional Quantity for Testing Performed by Caltrans	
		Finished Items	Material 300mm
PWS Anchor Rod - Length 8.0m	43	2	2 4
PWS Anchor Rod - Length 8.1m	20	1	2
PWS Anchor Rod - Length 8.2m	14	1	2
PWS Anchor Rod - Length 8.3m	52	2	2 4
PWS Anchor Rod - Length 8.4m	45	2	2 4
PWS Anchor Rod - Length 8.5m	22	2	2 4
PWS Anchor Rod - Length 8.6m	18	1	2
PWS Anchor Rod - Length 8.7m	23	1	2
PWS Anchor Rod - Length 8.8m	20	1	2
PWS Anchor Rod - Length 8.9m	6	1	2
PWS Anchor Rod - Length 9.0m	7	1	2
PWS Anchor Rod - Length 9.1m	4	1	2
3-1/2" Heavy Hex Nut A563 Gr DH	310	16	0
Coupling Nuts Per Sketch	278	16	0
3-1/2" Hardened Washer F436	310	16	0
5/8" x 1" Lg. SS Socket Set Screw	600	32	0

Please note: Two finished items implies that you were anticipating two lots. In that case four (4) material samples would have been required.

Response - ABF-RFI-001739R00

PWS Anchor Rod Heats

Dyson Code	Heat Number	Batch Number	Mill	Mill Cert Date	Translab Report Number	Translab Report Date	Notes
OOF	4M76368-2	N/A	Gerdau	7/19/2011	SM-11-0469	6/14/2011	Translab: Threads Fail, Strength OK
OOH	4M76368-3	N/A	Gerdau	7/19/2011	SM-11-0508	6/27/2011	Translab: Threads Fail, Strength OK
OPY	3M75738-2	N/A	Gerdau	7/19/2011	SM-11-0643, SM-11-0720	7/21/2011, 08/08/11	
OQW	3M75738-1	N/A	Gerdau	7/19/2011	SM-11-0720	8/8/2011	
OQX	4M76367-2	N/A	Gerdau	7/19/2011	SM-11-0720	8/8/2011	
OQY	4M76367-1	N/A	Gerdau	7/19/2011	SM-11-0720	8/8/2011	
OTD	4M76368-1	N/A	Gerdau	7/19/2011	SM-11-0643	7/21/2011	
OYG	A113149	H208	Steel Dynamics	8/30/2011	SM-11-1038	10/25/2011	No MT Cert From Stork-Herron
OYH	A113149	H210	Steel Dynamics	8/30/2011	SM-11-1078	10/26/2011	
OYI	A113149	H222	Steel Dynamics	8/30/2011	SM-11-1039	10/25/2011	
OYJ	A113151	H207	Steel Dynamics	8/30/2011	SM-11-1079	10/26/2011	
OYK	A113151	H208	Steel Dynamics	8/30/2011	SM-11-1038	10/25/2011	
OYL	A113151	H211	Steel Dynamics	8/30/2011	SM-11-1040	10/26/2011	
OYM	A113151	H214	Steel Dynamics	8/30/2011	SM-11-1076	10/26/2011	
OYN	A113151	H215	Steel Dynamics	8/30/2011	SM-11-1077	10/26/2011	
OYO	A113151	H217	Steel Dynamics	8/30/2011	SM-11-1041	10/26/2011	
OYP	A113151	H222	Steel Dynamics	8/30/2011	SM-11-1039	10/25/2011	No MT Cert From Stork-Herron



CODE 00F

GERDAU SPECIAL STEEL NORTH AMERICA
5591 MORRILL ROAD
JACKSON, MICHIGAN 49201

CERTIFIED MATERIAL TEST REPORT

CUSTOMER ORDER NUMBER 31637	CUSTOMER PART NUMBER	HEAT NUMBER 4M76368-2	PILE ORDER NUMBER 142993 102	DATE 7/19/11
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REPORT TO

SHIP TO

TURRET STEEL IND. INC.
105 PINE STREET

TURRET STEEL
PICK UP AT MILL

IMPERIAL , PA 15126-1142

ORDERED

GRADE 4140	SIZE 3.52"	LENGTH 32'
---------------	---------------	---------------

CUSTOMER SPECIFICATIONS
ASTM A354-07 GRADE BD; Q&T; AIM RC 35 / 37; TSI-130 4/13/07

CHEMICAL ANALYSIS

C	Mn	P	S	Si	Ni	Cr	Mo	Cu	Sn	Al
0.42	0.97	0.014	0.030	0.20	0.09	1.04	0.17	0.18	0.010	0.023
V	Co	Ca	N2							
0.003	0.002	0.0013	0.0060							

GRAIN SIZE SPECIFICATION ASTM E112 (5-8)

% OF GRAIN 5-8 AVG

M 100 7.0

HARDNESS SPECIFICATION Q&T (AIM 35-37RC)

CENTER	MID RADIUS	SURFACE	AVERAGE
32.0	35.9	38.7	35.5 HRC

PAGE 1

We certify that these data are correct and in compliance with specified requirements.

Gerdau Arkansas
5225 Planters Road
Fort Smith, AR 72916

Gerry W. Ridenour
Quality Assurance, Verification, Give

CONTINUED ON PAGE 2



CODE 00F

GERDAU SPECIAL STEEL NORTH AMERICA
5591 MORRILL ROAD
JACKSON, MISSISSIPPI 39201

CERTIFIED MATERIAL TEST REPORT

CUSTOMER ORDER NUMBER 31637	CUSTOMER PART NUMBER	TEST NUMBER 4M76368 -2	MORA ORDER NUMBER 142993 102	DATE 7/19/11
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REPORT TO

SHIP TO

TURRET STEEL IND. INC.
105 PINE STREET

TURRET STEEL
PICK UP AT MILL

IMPERIAL, PA 15126-1142

ORDERED

4140	GRADE	3.52"	SIZE	32'	LENGTH
------	-------	-------	------	-----	--------

ASTM A354-07 GRADE BD; Q&T; AIM RC 35 / 37; TSI-130 4/13/07

HARDENABILITY SPECIFICATION ASTM A304

ACTUAL

J1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 18 20 22 24 26 28 30 32 34
57 56 56 56 55 54 54 54 53 52 51 51 49 49 47 46 45 43 41 40 39 38 38 37

MACROCLEANLINESS SPECIFICATION ASTM E381 (S3-R2-C2)

PLATE I

PLATE II

AVERAGE S R C NONE

PHYSICALS SPECIFICATION ASTM A434

02.0 IN

TENSILE (KSI) YIELD (KSI) % ELONGATION REDUCTION OF AREA
158.0 139.0 14.9 52.0

DI CALCULATION SPECIFICATION REPORT

5.706

AUTO ULTRASONIC SPECIFICATION 100%

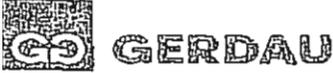
PAGE 2

We certify that these data are correct and in compliance with specified requirements.

Gerdau Arkansas
5225 Planters Road
Fort Smith, AR 72916

[Signature]
Gary W. Ridanoor
Quality Assurance Representative, Elva

CONTINUED ON PAGE 3



CODE 00F

GERDAU SPECIAL STEEL NORTH AMERICA
5591 MORRILL ROAD
JACKSON, MICHIGAN 49201

CERTIFIED MATERIAL TEST REPORT

CUSTOMER ORDER NUMBER 31637	CUSTOMER PART NUMBER	HEAT NUMBER 4M76368 -2	WORK ORDER NUMBER 142993 102	DATE 7/19/11
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REPORT TO

SHIP TO

TURRET STEEL IND. INC.
105 PINE STREET

TURRET STEEL
PICK UP AT MILL

IMPERIAL , PA 15126-1142

ORDERED

GRADE 4140	SIZE 3.52"	LENGTH 32'
---------------	---------------	---------------

CUSTOMER SPECIFICATIONS
ASTM A354-07 GRADE BD; Q&T; AIM RC 35 / 37; TSI-130 4/13/07

MATERIAL ULTRASONIC TESTED FOR INTERNAL SOUNDNESS.

QUENCH TIME,TEMP,ME SPECIFICATION REPORT

TREATMENT	TEMP F	TIME (MIN.)	MEDIA
AUSTENIZE	1650	8.30	
QUENCH	0		WATER
TEMPER	1090	8.30	

REDUCTION RATIO

RATIO= 7.1 TO 1.0

CIRCOGRAPH..... SPECIFICATION 100%

CIRCOGRAPH TESTED FOR SURFACE IMPERFECTIONS

MATERIAL HAS BEEN VACUUM DEGASSED.

** MATERIAL 100% MELTED AND MANUFACTURED IN THE U.S.A. BY THE ELECTRIC ARC FURNACE AND CONTINUOUS CASTING METHOD. THE PRODUCT HAS NOT BEEN REPAIRED BY WELDING AND THIS MATERIAL HAS NOT BEEN EXPOSED TO MERCURY OR TO ANY OTHER METAL ALLOY THAT IS LIQUID AT AMBIENT TEMPERATURES DURING PROCESSING OR WHILE IN OUR POSSESSION. GERDAU MONITORS ALL INCOMING SCRAP AND ALL HEATS OF STEEL TO ENSURE THAT PRODUCTS SHIPPED ARE FREE OF RADIOACTIVE MATERIAL.

PAGE 3

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Gerdau Arkansas
5225 Planters Road
Fort Smith, AR 72916

Gerdau Representative
Quality Assurance Department

CONTINUED ON PAGE 4



CODE OOF

GERDAU SPECIAL STEEL NORTH AMERICA
5591 MORRILL ROAD
JACKSON, MICHIGAN 49201

CERTIFIED MATERIAL TEST REPORT

<small>CUSTOMER ORDER NUMBER</small> 31637	<small>CUSTOMER PART NUMBER</small>	<small>GRAT NUMBER</small> 4M76368-2	<small>WORK ORDER NUMBER</small> 142993 102	<small>DATE</small> 7/19/11
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REPORT TO

SHIP TO

TURRET STEEL IND. INC.
105 PINE STREET

TURRET STEEL
PICK UP AT MILL

IMPERIAL , PA 15126-1142

ORDERED

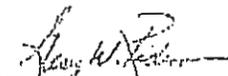
<small>GRADE</small> 4140	<small>SIZE</small> 3.52"	<small>LENGTH</small> 32'
------------------------------	------------------------------	------------------------------

CUSTOMER SPECIFICATIONS
ASTM A354-07 GRADE BD; Q&T; AIM RC 35 / 37; TSI-130 4/13/07

PAGE 4 OF 4

We certify that these data are correct and in compliance with specified requirements.

Gerdau Arkansas
5225 Planters Road
Fort Smith, AR 72916


Gary K. Rider
Quality Assurance Representative



CODE 00H

GERDAU SPECIAL STEEL NORTH AMERICA
5591 MORRILL ROAD
JACKSON, MICHIGAN 49201

CERTIFIED MATERIAL TEST REPORT

CUSTOMER ORDER NUMBER 31637	CUSTOMER PART NUMBER	DEPT NUMBER 4M76368-3	WORK ORDER NUMBER 142993 103	DATE 7/19/11
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REPORT TO
TURRET STEEL IND. INC.
105 PINE STREET

SHIP TO
TURRET STEEL
PICK UP AT MILL

IMPERIAL , PA 15126-1142

ORDERED

4140 GRADE	3.52" SIZE	32' LENGTH
------------	------------	------------

CUSTOMER SPECIFICATIONS
ASTM A354-07 GRADE BD; Q&T; AIM RC 35 / 37; TSI-130 4/13/07

CHEMICAL ANALYSIS

C	Mn	P	S	Si	Ni	Cr	Mo	Cu	Sn	Al
0.42	0.97	0.014	0.030	0.20	0.09	1.04	0.17	0.18	0.010	0.023
V	Cb	Ca	N2							
0.003	0.002	0.0013	0.0060							

GRAIN SIZE SPECIFICATION ASTM E112 (5-8)

% OF GRAIN 5-8 AVG

M 100 7.0

HARDNESS SPECIFICATION Q&T (AIM 35-37RC)

CENTER	MID RADIUS	SURFACE	AVERAGE
32.9	35.4	38.2	35.5 HRC

PAGE 1

We certify that these data are correct and in compliance with specified requirements.

Gerdau Arkansas
5225 Planters Road
Fort Smith, AR 72916

Gary H. Ridenour
Quality Assurance Representative

CONTINUED ON PAGE 2



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CODE 00H

GERDAU SPECIAL STEEL NORTH AMERICA
5591 MORRILL ROAD
JACKSON, MICHIGAN 49201

CERTIFIED MATERIAL TEST REPORT

CUSTOMER ORDER NUMBER 31637	CUSTOMER PART NUMBER	PLAT HEIGHT 4M76368 -3	WORK ORDER NUMBER 142993 103	DATE 7/19/11
--------------------------------	----------------------	---------------------------	---------------------------------	-----------------

REPORT TO

SHIPP TO

TURRET STEEL IND. INC.
105 PINE STREET

TURRET STEEL
PICK UP AT MILL

IMPERIAL , PA 15126-1142

ORDERED

GRADE 4140	SIZE 3.52"	LENGTH 32'
---------------	---------------	---------------

CUSTOMER SPECIFICATIONS
ASTM A354-07 GRADE BD; Q&T; AIM RC 35 / 37; TSI-130 4/13/07

HARDENABILITY SPECIFICATION ASTM A304

ACTUAL

J1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	18	20	22	24	26	28	30	32	34
57	56	56	56	55	54	54	54	53	52	51	51	49	49	47	46	45	43	41	40	39	38	38	37	

MACROCLEANLINESS SPECIFICATION ASTM E381 (83-R2-C2)

PLATE I

PLATE II

AVERAGE	S	R	C	
	1	1	1	NONE

PHYSICALS SPECIFICATION ASTM A434

02.0 IN

TENSILE (KSI)	YIELD (KSI)	% ELONGATION	REDUCTION OF AREA
150.0	130.0	16.5	48.0

DI CALCULATION SPECIFICATION REPORT

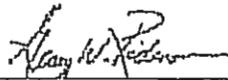
5.706

AUTO ULTRASONIC SPECIFICATION 100%

PAGE 2

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Gerdau Arkansas
5225 Planters Road
Fort Smith, AR 72916


 Gary W. Ridgour
 Quality Assurance Representative

CONTINUED ON PAGE 3



CODE 00H

GERDAU SPECIAL STEEL NORTH AMERICA
5501 MORRILL ROAD
JACKSON, MICHIGAN 49201

CERTIFIED MATERIAL TEST REPORT

CUSTOMER ORDER NUMBER 31637	CUSTOMER PART NUMBER	TEST NUMBER 4M76368 -3	WORK ORDER NUMBER 142993 103	DATE 7/19/11
--------------------------------	----------------------	---------------------------	---------------------------------	-----------------

REPORT TO
TURRET STEEL IND. INC.
105 PINE STREET

SHIP TO
TURRET STEEL
PICK UP AT MILL

IMPERIAL , PA 15126-1142

ORDERED

GRADE 4140	SIZE 3.52"	LENGTH 32'
---------------	---------------	---------------

CUSTOMER SPECIFICATIONS
ASTM A354-07 GRADE BD; Q&T; AIM RC 35 / 37; TSI-130 4/13/07

MATERIAL ULTRASONIC TESTED FOR INTERNAL SOUNDNESS.

QUENCH TIME, TEMP, ME SPECIFICATION REPORT

TREATMENT	TEMP F	TIME (MIN.)	MEDIA
AUSTENIZE	1650	8.30	
QUENCH	0		WATER
TEMPER	1090	8.30	

REDUCTION RATIO

RATIO= 7.1 TO 1.0

CIRCOGRAPH..... SPECIFICATION 100%

CIRCOGRAPH TESTED FOR SURFACE IMPERFECTIONS

MATERIAL HAS BEEN VACUUM DEGASSED.

** MATERIAL 100% MELTED AND MANUFACTURED IN THE U.S.A. BY THE ELECTRIC ARC FURNACE AND CONTINUOUS CASTING METHOD. THE PRODUCT HAS NOT BEEN REPAIRED BY WELDING AND THIS MATERIAL HAS NOT BEEN EXPOSED TO MERCURY OR TO ANY OTHER METAL ALLOY THAT IS LIQUID AT AMBIENT TEMPERATURES DURING PROCESSING OR WHILE IN OUR POSSESSION. GERDAU MONITORS ALL INCOMING SCRAP AND ALL HEATS OF STEEL TO ENSURE THAT PRODUCTS SHIPPED ARE FREE OF RADIOACTIVE MATERIAL.

PAGE 3

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Gerdau Arkansas
5225 Planters Road
Fort Smith, AR 72916

Gary H. Ridenour
Quality Assurance Representative

CONTINUED ON PAGE 4



CODE 00H

GERDAU SPECIAL STEEL NORTH AMERICA
5591 MORRILL ROAD
JACKSON, MICHIGAN 49201

CERTIFIED MATERIAL TEST REPORT

<small>CUSTOMER ORDER NUMBER</small> 31637	<small>CUSTOMER PART NUMBER</small>	<small>HEAT NUMBER</small> 4M76368 -3	<small>WORK ORDER NUMBER</small> 142993 103	<small>DATE</small> 7/19/11
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REPORT TO

TURRET STEEL IND. INC.
105 PINE STREET

SHIP TO

TURRET STEEL
PICK UP AT MILL

IMPERIAL , PA 15126-1142

ORDERED

<small>GRADE</small> 4140	<small>SIZE</small> 3.52"	<small>LENGTH</small> 32'
<small>CUSTOMER SPECIFICATIONS</small> ASTM A354-07 GRADE BD; Q&T; AIM RC 35 / 37; TSI-130 4/13/07		

PAGE 4 OF 4

We certify that these data are correct and in compliance with specified requirements.

Gerdau Arkansas
5225 Planters Road
Fort Smith, AR 72916

Gerry W. Ridenour
Quality Assurance Representative



CODE COPY

GERDAU SPECIAL STEEL NORTH AMERICA
5691 MORRILL ROAD
JACKSON, MICHIGAN 49201

CERTIFIED MATERIAL TEST REPORT

CUSTOMER ORDER NUMBER 31637	CUSTOMER PART NUMBER	HEAT NUMBER 3M75738 -2	WORK ORDER NUMBER 142992 102	DATE 7/19/11
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REPORT TO
TURRET STEEL IND. INC.
105 FINE STREET

SHIP TO
TURRET STEEL
PICK UP AT MILL

IMPERIAL, PA 15126-1142

ORDERED

4140 GRADE	3.52" SIZE	30' LENGTH
------------	------------	------------

ASTM A354-07 GRADE BD; Q&T; AIM RC 35 / 37; TSI-130 4/13/07

CHEMICAL ANALYSIS

C	Mn	P	S	Si	Ni	Cr	Mo	Cu	Sn	Al
0.41	0.95	0.014	0.030	0.20	0.09	1.04	0.17	0.18	0.010	0.025
V	Cb	Ca	N2							
0.003	0.002	0.0013	0.0076							

GRAIN SIZE SPECIFICATION ASTM E112 (5-8)
% OF GRAIN 5-8 AVG
M 100 7.0

HARDNESS SPECIFICATION Q&T (AIM 35-37RC)
CENTER MID RADIUS SURFACE AVERAGE
32.3 37.0 38.0 35.8 HRC

PAGE 1

We certify that these data are correct and in compliance with specified requirements.

Gerdau Arkansas
5225 Planters Road
Fort Smith, AR 72916

Geoff W. Aldenour
Quality Assurance Representative

CONTINUED ON PAGE 2



CODE COPY

GERDAU SPECIAL STEEL NORTH AMERICA
5591 MORRILL ROAD
JACKSON, MICHIGAN 49201

CERTIFIED MATERIAL TEST REPORT

CUSTOMER ORDER NUMBER 31637	CUSTOMER PART NUMBER	DEAT NUMBER 3M75738-2	WORK ORDER NUMBER 142992 102	DATE 7/19/11
--------------------------------	----------------------	--------------------------	---------------------------------	-----------------

REPORT TO

TURRET STEEL IND. INC.
105 PINE STREET

SUPPLY TO

TURRET STEEL
PICK UP AT MILL

IMPERIAL, PA 15126-1142

ORDERED

GRADE 4140	SIZE 3.52"	LENGTH 30'
---------------	---------------	---------------

ASTM A354-07 GRADE BD; Q&T; AIM RC 35 / 37; TSI-130 4/13/07

HARDENABILITY SPECIFICATION ASTM A304

ACTUAL

J1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	18	20	22	24	26	28	30	32	34
55	54	53	52	52	52	51	51	50	50	49	47	46	45	44	42	40	38	37	36	35	34	33	33	33

MACROCLEANLINESS SPECIFICATION ASTM E381 (S3-R2-C2)

PLATE I

PLATE II

AVERAGE	S	R	C	NONE
1	1	1		

PHYSICALS SPECIFICATION ASTM A434

02.0 IN

TENSILE (KSI)	YIELD (KSI)	% ELONGATION	REDUCTION OF AREA
147.0	126.0	18.6	52.0

DI CALCULATION SPECIFICATION REPORT

5.561

AUTO ULTRASONIC SPECIFICATION 100%

PAGE 2

We certify that these data are correct and in compliance with specified requirements.

Gerdau Arkansas
5225 Planters Road
Fort Smith, AR 72916

Gary W. Ridenour
Quality Assurance Representative

CONTINUED ON PAGE 3



CODE 0PY

GERDAU SPECIAL STEEL NORTH AMERICA
5591 MORRILL ROAD
JACKSON, MICHIGAN 49201

CERTIFIED MATERIAL TEST REPORT

CUSTOMER ORDER NUMBER 31637	CUSTOMER PART NUMBER	HEAT NUMBER 3M75738-2	WIRE GAGES NUMBER 142992 102	DATE 7/19/11
--------------------------------	----------------------	--------------------------	---------------------------------	-----------------

REPORT TO
TORRET STEEL IND. INC.
105 PINE STREET

ORDER TO
TORRET STEEL
PICK UP AT MILL

IMPERIAL, PA 15126-1142

ORDERED

GRADE 4140	SIZE 3.52"	LENGTH 30'
---------------	---------------	---------------

CUSTOMER SPECIFICATIONS
ASTM A354-07 GRADE BD; Q&T; AIM RC 35 / 37; TSI-130 4/13/07

MATERIAL ULTRASONIC TESTED FOR INTERNAL SOUNDNESS.

QUENCH TIME, TEMP, ME SPECIFICATION REPORT

TREATMENT	TEMP F	TIME (MIN.)	MEDIA
AUSTENIZE	1650	8.30	
QUENCH	0		WATER
TEMPER	1110	8.30	

REDUCTION RATIO

RATIO= 7.1 TO 1.0

CIRCOGRAPH..... SPECIFICATION 100%

CIRCOGRAPH TESTED FOR SURFACE IMPERFECTIONS

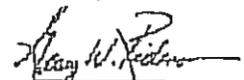
MATERIAL HAS BEEN VACUUM DEGASSED.

** MATERIAL 100% MELTED AND MANUFACTURED IN THE U.S.A. BY THE ELECTRIC ARC FURNACE AND CONTINUOUS CASTING METHOD. THE PRODUCT HAS NOT BEEN REPAIRED BY WELDING AND THIS MATERIAL HAS NOT BEEN EXPOSED TO MERCURY OR TO ANY OTHER METAL ALLOY THAT IS LIQUID AT AMBIENT TEMPERATURES DURING PROCESSING OR WHILE IN OUR POSSESSION. GERDAU MONITORS ALL INCOMING SCRAP AND ALL HEATS OF STEEL TO ENSURE THAT PRODUCTS SHIPPED ARE FREE OF RADIOACTIVE MATERIAL.

PAGE 3

We certify that these data are correct and in compliance with specified requirements.

Gerdau Arkansas
5225 Planters Road
Fort Smith, AR 72916


Gary W. Ridgour
Quality Assurance Representative

CONTINUED ON PAGE 4



CODE COPY

GERDAU SPECIAL STEEL NORTH AMERICA
5991 MORRILL ROAD
JACKSON, MICHIGAN 49201

CERTIFIED MATERIAL TEST REPORT

CUSTOMER ORDER NUMBER 31637	CUSTOMER PART NUMBER	PLAT NUMBER 3M75738-2	MOCK ORDER NUMBER 142992 102	DATE 7/19/11
--------------------------------	----------------------	--------------------------	---------------------------------	-----------------

REPORT TO
TURRET STEEL IND. INC.
105 PINE STREET

SHIP TO
TURRET STEEL
PICK UP AT MILL

IMPERIAL , PA 15126-1142

ORDERED

4140	GRADE	3.52"	SIDE	30'	LENGTH
------	-------	-------	------	-----	--------

CUSTOMER SPECIFICATIONS
ASTM A354-07 GRADE BD; Q&T; AIM RC 35 / 37; TSI-130 4/13/07

PAGE 4 OF 4

We certify that these data are correct and in compliance with specified requirements.

Gerdau Arkansas
5225 Planters Road
Fort Smith, AR 72916

Cary W. Ridonour
Quality Assurance Representative



CODE 00W

GERDAU SPECIAL STEEL NORTH AMERICA
5501 MORRILL ROAD
JACKSON, MICHIGAN 49201

CERTIFIED MATERIAL TEST REPORT

CUSTOMER ORDER NUMBER 31637	CUSTOMER PART NUMBER	HEAT NUMBER 3M75738 -1	WORK ORDER NUMBER 142992 103	DATE 7/19/11
--------------------------------	----------------------	---------------------------	---------------------------------	-----------------

DESTROY TO	SHIP TO
TURRET STEEL IND. INC. 105 PINE STREET IMPERIAL , PA 15126-1142	TURRET STEEL PICK UP AT MILL

ORDERED

4140 GRADE	3.52" SIZE	30' LENGTH
------------	------------	------------

CUSTOMER SPECIFICATIONS
ASTM A354-07 GRADE BD; Q&T; AIM RC 35 / 37; TSI-130 4/13/07

CHEMICAL ANALYSIS

C	Mn	P	S	Si	Ni	Cr	Mo	Cu	Sn	Al
0.41	0.95	0.014	0.030	0.20	0.09	1.04	0.17	0.18	0.010	0.025
V	Cb	Ca	N2							
0.003	0.002	0.0013	0.0076							

GRAIN SIZE SPECIFICATION ASTM E112 (5-8)

1/2 OF GRAIN 5-8 AVG

M 100 7.0

HARDNESS SPECIFICATION Q&T (AIM 35-37RC)

CENTER	MID RADIUS	SURFACE	AVERAGE
32.3	37.0	38.0	35.8 HRC

PAGE 1

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Gerdau Arkansas
5225 Planters Road
Fort Smith, AR 72916

Gary W. Ridenour
Quality Assurance Representative

CONTINUED ON PAGE 2



CODE OQW

GERDAU SPECIAL STEEL NORTH AMERICA
5591 MORRILL ROAD
JACKSON, MICHIGAN 49201

CERTIFIED MATERIAL TEST REPORT

CUSTOMER ORDER NUMBER 31637	CUSTOMER PART NUMBER	UNIT NUMBER 3M75738_1	POUR ORDER NUMBER 142992 103	DATE 7/19/11
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REPORT TO	SHIP TO
TURRET STEEL IND. INC. 105 PINE STREET IMPERIAL , PA 15126-1142	TURRET STEEL PICK UP AT MILL

ORDERED

GRADE 4140	SIZE 3.52"	LENGTH 30'
---------------	---------------	---------------

CUSTOMER SPECIFICATIONS
ASTM A354-07 GRADE BD; Q&T; AIM RC 35 / 37; TSI-130 4/13/07

HARDENABILITY SPECIFICATION ASTM A304

ACTUAL

J1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	18	20	22	24	26	28	30	32	34
55	54	53	52	52	52	51	51	50	50	49	47	46	45	44	42	40	38	37	36	35	34	33	33	

MACROCLEANLINESS SPECIFICATION ASTM E381 (S3-R2-C2)

	PLATE I			PLATE II
	S	R	C	
AVERAGE	1	1	1	NONE

PHYSICALS SPECIFICATION ASTM A434

02.0 IN

TENSILE (KSI)	YIELD (KSI)	% ELONGATION	REDUCTION OF AREA
147.0	126.0	18.6	52.0

DI CALCULATION SPECIFICATION REPORT

5.561

AUTO ULTRASONIC SPECIFICATION 100%

PAGE 2

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Gerdau Arkansas
5225 Planters Road
Fort Smith, AR 72916

Gary W. Bidanour
Quality Assurance Representative

CONTINUED ON PAGE 3



CODE 00W

GERDAU SPECIAL STEEL NORTH AMERICA
5501 HERRILL ROAD
JACKSON, MICHIGAN 49201

CERTIFIED MATERIAL TEST REPORT

CUSTOMER ORDER NUMBER 31637	CUSTOMER PART NUMBER	HEAT NUMBER 3M75738-1	WORK ORDER NUMBER 142992 103	DATE 7/19/11
--------------------------------	----------------------	--------------------------	---------------------------------	-----------------

REPORT TO

TURRET STEEL IND. INC.
105 PINE STREET

ORDER TO

TURRET STEEL
PICK UP AT MILL

IMPERIAL , PA 15126-1142

ORDERED

GRADE 4140	SIZE 3.52"	LENGTH 30'
---------------	---------------	---------------

CUSTOMER SPECIFICATIONS
ASTM A354-07 GRADE BD; Q&T; AIM RC 35 / 37; TSI-130 4/13/07

MATERIAL ULTRASONIC TESTED FOR INTERNAL SOUNDNESS.

QUENCH TIME, TEMP, ME SPECIFICATION REPORT

TREATMENT	TEMP F	TIME (MIN.)	MEDIA
AUSTENIZE	1650	8.30	
QUENCH	0		WATER
TEMPER	1110	8.30	

REDUCTION RATIO

RATIO= 7.1 TO 1.0

CIRCOGRAPH..... SPECIFICATION 100%

CIRCOGRAPH TESTED FOR SURFACE IMPERFECTIONS

MATERIAL HAS BEEN VACUUM DEGASSED.

** MATERIAL 100% MELTED AND MANUFACTURED IN THE U.S.A. BY THE ELECTRIC ARC FURNACE AND CONTINUOUS CASTING METHOD. THE PRODUCT HAS NOT BEEN REPAIRED BY WELDING AND THIS MATERIAL HAS NOT BEEN EXPOSED TO MERCURY OR TO ANY OTHER METAL ALLOY THAT IS LIQUID AT AMBIENT TEMPERATURES DURING PROCESSING OR WHILE IN OUR POSSESSION. GERDAU MONITORS ALL INCOMING SCRAP AND ALL HEATS OF STEEL TO ENSURE THAT PRODUCTS SHIPPED ARE FREE OF RADIOACTIVE MATERIAL.

PAGE 3

We certify that these data are correct and in compliance with specified requirements.

Gerdau Arkansas
5225 Planters Road
Fort Smith, AR 72916

Gary H. Ridonour
Quality Assurance Representative

CONTINUED ON PAGE 4



CODE 0QW

GERDAU SPECIAL STEEL NORTH AMERICA
5591 MORRILL ROAD
JACKSON, MICHIGAN 49201

CERTIFIED MATERIAL TEST REPORT

<small>CUSTOMER ORDER NUMBER</small> 31637	<small>CUSTOMER PART NUMBER</small>	<small>HEAT NUMBER</small> 3M75738 -1	<small>WORK ORDER NUMBER</small> 142992 103	<small>DATE</small> 7/19/11
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REPORT TO

SHIP TO

TURRET STEEL IND. INC.
105 PINE STREET

TURRET STEEL
PICK UP AT MILL

IMPERIAL , PA 15126-1142

ORDERED

<small>GRADE</small> 4140	<small>SIZE</small> 3.52"	<small>LENGTH</small> 30'
------------------------------	------------------------------	------------------------------

CUSTOMER SPECIFICATIONS
ASTM A354-07 GRADE BD; Q&T; AIM RC 35 / 37; TSI-130 4/13/07

PAGE 4 OF 4

We certify that these data are correct and in compliance with specified requirements.

Gerdau Arkansas
5225 Planters Road
Fort Smith, AR 72916

Gary H. Ridenour
Quality Assurance Representative



CODE 00X

GERDAU SPECIAL STEEL NORTH AMERICA
5591 HONRILL ROAD
JACKSON, MICHIGAN 49201

CERTIFIED MATERIAL TEST REPORT

CUSTOMER ORDER NUMBER 31637	CUSTOMER PART NUMBER	HEAT NUMBER 4M76367-2	MOCK ORDER NUMBER 142985 102	DATE 7/19/11
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REPORT TO
TURRET STEEL IND. INC.
105 PINE STREET

BUY TO
TURRET STEEL
PICK UP AT MILL

IMPERIAL, PA 15126-1142

ORDERED

GRADE 4140	THICKNESS 3.52"	LENGTH 29'
---------------	--------------------	---------------

CUSTOMER SPECIFICATIONS
ASTM A354-07 GRADE BD; Q&T; AIM RC 35 / 37; TSI-130 4/13/07

CHEMICAL ANALYSIS

C	Mn	P	S	Si	Ni	Cr	Mo	Cu	Sn	Al
0.41	0.96	0.014	0.028	0.18	0.08	1.03	0.17	0.16	0.010	0.023
V	Cb	Ca	N2							
0.004	0.002	0.0010	0.0082							

GRAIN SIZE SPECIFICATION ASTM E112 (5-8)

% OF GRAIN 5-8 AVG

M 100 7.0

HARDNESS SPECIFICATION Q&T (AIM 35-37RC)

CENTER	MID RADIUS	SURFACE	AVERAGE
31.9	35.1	37.8	34.9 HRC

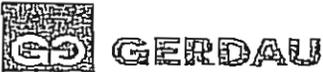
PAGE 1

We certify that these data are correct and in compliance with specified requirements.

Gerdau Arkansas
5325 Planters Road
Fort Smith, AR 72916

Gentry K. Ridenour
Quality Assurance Representative

CONTINUED ON PAGE 2



CODE 00X

GERDAU SPECIAL STEEL NORTH AMERICA
5591 MORRILL ROAD
JACKSON, MICHIGAN 49201

CERTIFIED MATERIAL TEST REPORT

CUSTOMER ORDER NUMBER 31637	CUSTOMER PART NUMBER	TEST NUMBER 4M76367-2	WORK ORDER NUMBER 142985 102	DATE 7/19/11
--------------------------------	----------------------	--------------------------	---------------------------------	-----------------

REPORT TO
TURRET STEEL IND. INC.
105 PINE STREET

SHIP TO
TURRET STEEL
PICK UP AT MILL

IMPERIAL, PA 15126-1142

ORDERED

GRADE 4140	SIZE 3.52"	LENGTH 29'
---------------	---------------	---------------

CUSTOMER SPECIFICATIONS
ASTM A354-07 GRADE BD; Q&T; AIM RC 35 / 37; TSI-130 4/13/07

HARDENABILITY SPECIFICATION ASTM A304

ACTUAL

J1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	18	20	22	24	26	28	30	32	34
57	56	55	55	54	54	54	53	52	52	51	50	49	47	46	45	43	41	41	40	38	37	36	35	

MACROCLEANLINESS SPECIFICATION ASTM E381 (S3-R2-C2)

PLATE I

PLATE II

	S	R	C	
AVERAGE	1	1	1	NONE

PHYSICALS SPECIFICATION ASTM A434

02.0 IN

TENSILE (KSI)	YIELD (KSI)	% ELONGATION	REDUCTION OF AREA
150.0	128.0	18.8	56.0

DI CALCULATION SPECIFICATION REPORT

5.454

AUTO ULTRASONIC SPECIFICATION 100%

PAGE 2

We certify that these data are correct and in compliance with specified requirements.

Gerdau Arkansas
5225 Planters Road
Fort Smith, AR 72916

Gary M. Ridgour
Quality Assurance Representative

CONTINUED ON PAGE 3



CODE 00X

GERDAU SPECIAL STEEL NORTH AMERICA
5591 MORRILL ROAD
JACKSON, MICHIGAN 49201

CERTIFIED MATERIAL TEST REPORT

CUSTOMER ORDER NUMBER 31637	CUSTOMER PART NUMBER	HEAT NUMBER 4M76367 -2	MOCK ORDER NUMBER 142985 102	DATE 7/19/11
--------------------------------	----------------------	---------------------------	---------------------------------	-----------------

REPORT TO
TURRET STEEL IND. INC.
105 PINE STREET

SHIP TO
TURRET STEEL
PICK UP AT MILL

IMPERIAL, PA 15126-1142

ORDERED

GRADE 4140	SIZE 3.52"	LENGTH 29'
---------------	---------------	---------------

CUSTOMER SPECIFICATIONS
ASTM A354-07 GRADE BD; Q&T; AIM RC 35 / 37; TSI-130 4/13/07

MATERIAL ULTRASONIC TESTED FOR INTERNAL SOUNDNESS

QUENCH TIME, TEMP, ME SPECIFICATION REPORT

TREATMENT	TEMP F	TIME (MIN.)	MEDIA
AUSTENIZE	1645	8.30	
QUENCH	0		WATER
TEMPER	1080	8.30	

REDUCTION RATIO

RATIO= 7.1 TO 1.0

CIRCOGRAPH..... SPECIFICATION 100%

CIRCOGRAPH TESTED FOR SURFACE IMPERFECTIONS

MATERIAL HAS BEEN VACUUM DEGASSED.

** MATERIAL 100% MELTED AND MANUFACTURED IN THE U.S.A. BY THE ELECTRIC ARC FURNACE AND CONTINUOUS CASTING METHOD. THE PRODUCT HAS NOT BEEN REPAIRED BY WELDING AND THIS MATERIAL HAS NOT BEEN EXPOSED TO MERCURY OR TO ANY OTHER METAL ALLOY THAT IS LIQUID AT AMBIENT TEMPERATURES DURING PROCESSING OR WHILE IN OUR POSSESSION. GERDAU MONITORS ALL INCOMING SCRAP AND ALL HEATS OF STEEL TO ENSURE THAT PRODUCTS SHIPPED ARE FREE OF RADIOACTIVE MATERIAL.

PAGE 3

We certify that these data are correct and in compliance with specified requirements.

Gerdau Arkansas
5225 Planters Road
Fort Smith, AR 72916

Gary W. Ridgour
Quality Assurance Representative

CONTINUED ON PAGE 4



CODE 00X

GERDAU SPECIAL STEEL NORTH AMERICA
5591 MORRILL ROAD
JACKSON, MICHIGAN 49201

CERTIFIED MATERIAL TEST REPORT

CUSTOMER ORDER NUMBER 31637	CUSTOMER PART NUMBER	HEAT NUMBER 4M76367 -2	INVOICE ORDER NUMBER 142985 102	DATE 7/19/11
--------------------------------	----------------------	---------------------------	------------------------------------	-----------------

REPORT TO

TURRET STEEL IND. INC.
105 PINE STREET

SHIP TO

TURRET STEEL
PICK UP AT MILL

IMPERIAL , PA 15126-1142

ORDERED

GRADE 4140	SIZE 3.52"	LENGTH 29'
---------------	---------------	---------------

CUSTOMER SPECIFICATIONS
ASTM A354-07 GRADE BD; Q&T; AIM RC 35 / 37; TSI-130 4/13/07

PAGE 4 OF 4

We certify that these data are correct and in compliance with specified requirements.

Gerdau Arkansas
5225 Planters Road
Fort Smith, AR 72916

Gary W. Ridinger
Quality Assurance Representative



CODE 00Y

GERDAU SPECIAL STEEL NORTH AMERICA
5591 MORRILL ROAD
JACKSON, MICHIGAN 49201

CERTIFIED MATERIAL TEST REPORT

CUSTOMER ORDER NUMBER 31637	CUSTOMER PART NUMBER	HEAT NUMBER 4M76367-1	WORK ORDER NUMBER 142985 103	DATE 7/19/11
--------------------------------	----------------------	--------------------------	---------------------------------	-----------------

REPORT TO	BUYER TO
TURRET STEEL IND. INC. 105 PINE STREET IMPERIAL , PA 15126-1142	TURRET STEEL PICK UP AT MILL

ORDERED

GRADE 4140	SIZE 3.52"	LENGTH 29'
---------------	---------------	---------------

CUSTOMER SPECIFICATIONS
ASTM A354-07 GRADE BD; Q&T; AIM RC 35 / 37; TSI-130 4/13/07

CHEMICAL ANALYSIS

C	Mn	P	S	Si	Ni	Cr	Mo	Cu	Sn	Al
0.41	0.96	0.014	0.028	0.18	0.08	1.03	0.17	0.16	0.010	0.023
V	Cb	Ca	N2							
0.004	0.002	0.0010	0.0082							

GRAIN SIZE SPECIFICATION ASTM E112 (5-8)

% OF GRAIN 5-8 AVG

N 100 7.0

HARDNESS SPECIFICATION Q&T (AIM 35-37RC)

CENTER	MID RADIUS	SURFACE	AVERAGE
31.3	33.0	37.1	33.8 HRC

PAGE 1

We certify that these data are correct and in compliance with specified requirements.

Gerdau Arkansas
5225 Planters Road
Fort Smith, AR 72916

George W. Ridenour
Quality Assurance Representative

CONTINUED ON PAGE 2



CODE 0024

GERDAU SPECIAL STEEL NORTH AMERICA
5591 MORRILL ROAD
JACKSON, MICHIGAN 49201

CERTIFIED MATERIAL TEST REPORT

CUSTOMER ORDER NUMBER 31637	CUSTOMER PART NUMBER	HEAT NUMBER 4M76367-1	WORK ORDER NUMBER 142985 103	DATE 7/19/11
--------------------------------	----------------------	--------------------------	---------------------------------	-----------------

REPORT TO	SHIP TO
TURRET STEEL IND. INC. 105 PINE STREET IMPERIAL , PA 15126-1142	TURRET STEEL PICK UP AT MILL

ORDERED

GRADE 4140	THICKNESS 3.52"	LENGTH 29'
---------------	--------------------	---------------

CUSTOMER SPECIFICATIONS
ASTM A354-07 GRADE BD; Q&T; AIM RC 35 / 37; TSI-130 4/13/07

HARDENABILITY SPECIFICATION ASTM A304

ACTUAL

J1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	18	20	22	24	26	28	30	32	34
57	56	55	55	54	54	54	53	52	52	51	50	49	47	46	45	43	41	41	40	38	37	36	35	

MACROCLEANLINESS SPECIFICATION ASTM E381 (S3-R2-C2)

PLATE I

PLATE II

	S	R	C	
AVERAGE	1	1	1	NONE

PHYSICALS SPECIFICATION ASTM A434

02.0 IN

TENSILE (KSI)	YIELD (KSI)	% ELONGATION	REDUCTION OF AREA
150.0	128.0	18.8	56.0

DI CALCULATION SPECIFICATION REPORT

5.454

AUTO ULTRASONIC SPECIFICATION 100%

PAGE 2

We certify that these data are correct and in compliance with specified requirements.

Gerdau Arkansas
5225 Planters Road
Fort Smith, AR 72916

Gary W. Bidanour
Quality Assurance Representative

CONTINUED ON PAGE 3



CODE 00Y

GERDAU SPECIAL STEEL NORTH AMERICA
5593 MORRILL ROAD
JACKSON, MICHIGAN 49201

CERTIFIED MATERIAL TEST REPORT

CUSTOMER ORDER NUMBER 31637	CUSTOMER PART NUMBER	HEAT NUMBER 4M76367-1	WORK ORDER NUMBER 142985 103	DATE 7/19/11
--------------------------------	----------------------	--------------------------	---------------------------------	-----------------

REPORT TO
TURRET STEEL IND. INC.
105 PINE STREET

SHIP TO
TURRET STEEL
PICK UP AT MILL

IMPERIAL , PA 15126-1142

ORDERED

GRADE 4140	SIZE 3.52"	LENGTH 29'
---------------	---------------	---------------

CUSTOMER SPECIFICATIONS
ASTM A354-07 GRADE BD; Q&T; AIM RC 35 / 37; TSI-130 4/13/07

MATERIAL ULTRASONIC TESTED FOR INTERNAL SOUNDNESS.

QUENCH TIME, TEMP, ME SPECIFICATION REPORT

TREATMENT	TEMP F	TIME (MIN.)	MEDIA
AUSTENIZE	1645	8.30	
QUENCH	0		WATER
TEMPER	1080	8.30	

REDUCTION RATIO

RATIO= 7.1 TO 1.0

CIRCOGRAPH..... SPECIFICATION 100%

CIRCOGRAPH TESTED FOR SURFACE IMPERFECTIONS

MATERIAL HAS BEEN VACUUM DEGASSED.

** MATERIAL 100% MELTED AND MANUFACTURED IN THE U.S.A. BY THE ELECTRIC ARC FURNACE AND CONTINUOUS CASTING METHOD. THE PRODUCT HAS NOT BEEN REPAIRED BY WELDING AND THIS MATERIAL HAS NOT BEEN EXPOSED TO MERCURY OR TO ANY OTHER METAL ALLOY THAT IS LIQUID AT AMBIENT TEMPERATURES DURING PROCESSING OR WHILE IN OUR POSSESSION. GERDAU MONITORS ALL INCOMING SCRAP AND ALL HEATS OF STEEL TO ENSURE THAT PRODUCTS SHIPPED ARE FREE OF RADIOACTIVE MATERIAL.

PAGE 3

We certify that these data are correct and in compliance with specified requirements.

Gerdau Arkansas
5225 Planters Road
Fort Smith, AR 72916

Gary H. Ridgour
Quality Assurance Representative

CONTINUED ON PAGE 4



CODE 004

GERDAU SPECIAL STEEL NORTH AMERICA
5591 HERRILL ROAD
JACKSON, MICHIGAN 49201

CERTIFIED MATERIAL TEST REPORT

CUSTOMER ORDER NUMBER 31637	CUSTOMER PART NUMBER	HEAT NUMBER 4M76367_1	WORK ORDER NUMBER 142985 103	DATE 7/19/11
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REPORT TO

TURRET STEEL IND. INC.
105 PINE STREET

IMPERIAL , PA 15126-1142

SHIP TO

TURRET STEEL
PICK UP AT MILL

ORDERED

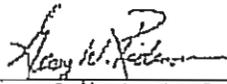
DIAMETER 4140	THICKNESS 3.52"	LENGTH 29'
------------------	--------------------	---------------

CUSTOMER SPECIFICATIONS
ASTM A354-07 GRADE BD; Q&T; AIM RC 35 / 37; TSI-130 4/13/07

PAGE 4 OF 4

We certify that these data are correct and in compliance with specified requirements.

Gerdau Arkansas
5225 Planters Road
Fort Smith, AR 72916


 Gary H. Ridenour
 Quality Assurance Representative



CODE OTD

GERDAU SPECIAL STEEL NORTH AMERICA
5991 MORRILL ROAD
JACKSON, MICHIGAN 49201

CERTIFIED MATERIAL TEST REPORT

CUSTOMER ORDER NUMBER 31637	CUSTOMER PART NUMBER	HEAT NUMBER 4M76368-1	WORK ORDER NUMBER 142593 104	DATE 7/19/11
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REPORT TO

SHIP TO

TURRET STEEL IND. INC.
105 PINE STREET

TURRET STEEL
PICK UP AT MILL

IMPERIAL , PA 15126-1142

ORDERED

4140 <small>GRADE</small>	3.52" <small>SIZE</small>	32' <small>LENGTH</small>
---------------------------	---------------------------	---------------------------

CUSTOMER SPECIFICATIONS
ASTM A354-07 GRADE BD; Q&T; AIM RC 35 / 37; TSI-130 4/13/07

CHEMICAL ANALYSIS

C	Mn	P	S	Si	Ni	Cr	Mo	Cu	Sn	Al	
0.42	0.97	0.014	0.030	0.20	0.09	1.04	0.17	0.18	0.010	0.023	
V	Ca	N2									
0.003	0.002	0.0013	0.0060								

GRAIN SIZE SPECIFICATION ASTM E112 (5-8)

% OF GRAIN 5-8 AVG

M 100 7.0

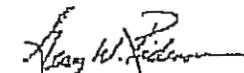
HARDNESS SPECIFICATION Q&T (AIM 35-37RC)

CENTER	MID RADIUS	SURFACE	AVERAGE
31.9	35.6	38.8	35.4 HRC

PAGE 1

We certify that these data are correct and in compliance with specified requirements.

Gerdau Arkansas
5225 Planters Road
Fort Smith, AR 72916


Gary H. Ridgway
Quality Assurance Representative

CONTINUED ON PAGE 2



CODE OTD

GERDAU SPECIAL STEEL NORTH AMERICA
5591 MORRILL ROAD
JACKSON, MICHIGAN 49201

CERTIFIED MATERIAL TEST REPORT

CUSTOMER ORDER NUMBER 31637	CUSTOMER PART NUMBER	HEAT NUMBER 4M76368-1	WORK ORDER NUMBER 142993 104	DATE 7/19/11
--------------------------------	----------------------	--------------------------	---------------------------------	-----------------

REPORT TO: TURRET STEEL IND. INC.
105 PINE STREET
IMPERIAL, PA 15126-1142

SHIP TO: TURRET STEEL
PICK UP AT MILL

ORDERED

4140	GRADE	3.52"	SIZE	32'	LENGTH																			
CUSTOMER SPECIFICATIONS ASTM A354-07 GRADE BD; Q&T; AIM RC 35 / 37; TSI-130 4/13/07																								
HARDENABILITY		SPECIFICATION ASTM A304																						
ACTUAL																								
J1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	18	20	22	24	26	28	30	32	34
57	56	56	56	55	54	54	54	53	52	51	51	49	49	47	46	45	43	41	40	39	38	38	37	
MACROCLEANLINESS		SPECIFICATION ASTM E381 (S3-R2-C2)																						
PLATE I			PLATE II																					
AVERAGE	S	R	C	NONE																				
	1	1	1																					
PHYSICALS		SPECIFICATION ASTM A434																						
02.0 IN																								
TENSILE (KSI)	YIELD (KSI)	% ELONGATION	REDUCTION OF AREA																					
150.0	130.0	16.5	48.0																					
DI CALCULATION		SPECIFICATION REPORT																						
5.706																								
AUTO ULTRASONIC		SPECIFICATION 100%																						
PAGE 2																								

We certify that these data are correct and in compliance with specified requirements.

Gerdau Arkansas
5225 Planters Road
Fort Smith, AR 72916

Gary W. Ridonour
Quality Assurance Representative

CONTINUED ON PAGE 3



GERDAU SPECIAL STEEL NORTH AMERICA
 5591 MORRILL ROAD
 JACKSON, MICHIGAN 49201

CODE OTD

CERTIFIED MATERIAL TEST REPORT

CUSTOMER ORDER NUMBER 31637	CUSTOMER PART NUMBER	HEAT NUMBER 4M76368 -1	WORK ORDER NUMBER 142993 104	DATE 7/19/11
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REPORT TO

SHIP TO

TURRET STEEL IND. INC.
 105 PINE STREET

TURRET STEEL
 PICK UP AT MILL

IMPERIAL , PA 15126-1142

ORDERED

GRADE 4140	SIZE 3.52"	LENGTH 32'
---------------	---------------	---------------

CUSTOMER SPECIFICATIONS
 ASTM A354-07 GRADE BD; Q&T; AIM RC 35 / 37; TSI-130 4/13/07

MATERIAL ULTRASONIC TESTED FOR INTERNAL SOUNDNESS.

QUENCH TIME, TEMP, ME SPECIFICATION REPORT

TREATMENT	TEMP F	TIME (MIN.)	MEDIA
AUSTENIZE	1650	8.30	
QUENCH	0		WATER
TEMPER	1090	8.30	

REDUCTION RATIO

RATIO= 7.1 TO 1.0

CIRCOGRAPH..... SPECIFICATION 100%

CIRCOGRAPH TESTED FOR SURFACE IMPERFECTIONS

MATERIAL HAS BEEN VACUUM DEGASSED.

** MATERIAL 100% MELTED AND MANUFACTURED IN THE U.S.A. BY THE ELECTRIC ARC FURNACE AND CONTINUOUS CASTING METHOD. THE PRODUCT HAS NOT BEEN REPAIRED BY WELDING AND THIS MATERIAL HAS NOT BEEN EXPOSED TO MERCURY OR TO ANY OTHER METAL ALLOY THAT IS LIQUID AT AMBIENT TEMPERATURES DURING PROCESSING OR WHILE IN OUR POSSESSION. GERDAU MONITORS ALL INCOMING SCRAP AND ALL HEATS OF STEEL TO ENSURE THAT PRODUCTS SHIPPED ARE FREE OF RADIOACTIVE MATERIAL.

PAGE 3

We certify that these data are correct and in compliance with specified requirements.

Gerdau Arkansas
 5225 Planters Road
 Fort Smith, AR 72916

Gary W. Bidanour
 Quality Assurance Representative

CONTINUED ON PAGE 4



CODE OTD

GERDAU SPECIAL STEEL NORTH AMERICA
5591 MORRILL ROAD
JACKSON, MICHIGAN 49201

CERTIFIED MATERIAL TEST REPORT

CUSTOMER ORDER NUMBER 31637	CUSTOMER PART NUMBER	HEAT NUMBER 4M7636B-1	WORK ORDER NUMBER 142993 104	DATE 7/19/11
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REPORT TO

SHIPP TO

TURRET STEEL IND. INC.
105 PINE STREET

TURRET STEEL
PICK UP AT MILL

IMPERIAL , PA 15126-1142

ORDERED

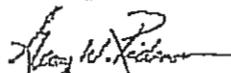
GRADE 4140	SIZE 3.52"	LENGTH 32'
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CUSTOMER SPECIFICATIONS
ASTM A354-07 GRADE BD; Q&T; AIM RC 35 / 37; TSI-130 4/13/07

PAGE 4 OF 4

We certify that these data are correct and in compliance with specified requirements.

Gerdau Arkansas
5225 Planters Road
Fort Smith, AR 72916


George W. Ridemaur
Quality Assurance Representative

CODE OYG

Certified Material Test Report

Coil # : 117855	Mill Order : 1108058	Heat # : A113149	Issued : 8/30/2011 09:38:57
Work Order : 115418	Sales Order : 95886-1	Customer : Turret Steel Industries	PO # : 33033-1
Load # : 141557	Reference # :	Reference Desc :	End Use :
Size : 3-3/4"	Shape : Round	Grade : 4140	Length : 32'00"
Grain Practice : AI Fine Grain (5-8) per ASTM A29		Reduction Ratio : 12.9 to 1	Disposition : 1

Ladle Chemistry Analysis (ASTM A29)

C	Mn	P	S	Si	Al	Cu	Ni	Cr	Mo	Sn	N	V	Cb	B	Ca	W	Ti	DL
0.41	0.95	0.009	0.006	0.27	0.025	0.18	0.16	0.99	0.22	0.011	0.0069	0.004	0.002	0.0001	0.0013	0.000	0.002	6.31
Pb	Co	As	Sb	Zr	Bi	H	O	Coq	J-Factor									
0.001	0.008	0.005	0.003	0.001	0.001	1.6		0.84										

Product Check Analysis (ASTM A29)

	C	Mn	P	S	Si	Al	Cu	Ni	Cr	Mo	Sn	N	V	Cb	Ti	B	Ca	O
Front																		
Back																		

Jominy (ASTM A255)

	J1	J2	J3	J4	J5	J6	J7	J8	J9	J10	J12	J14	J16	J18	J20	J24	J28	J32
Calc'd	57	57	57	57	57	57	67	57	57	57	55	52	50	50	49	48	47	43
Front																		
Back																		

Microcleanliness (ASTM E45)

Method A								Method C				Method E			
AT	AH	BT	BH	CT	CH	DT	DH	S	O	SAM "B"	SAM "D"				

Microcleanliness (DIN 50602)

K				M			
S	O	Tot	Tot				

Decarb	
Depth	% of Diameter

Grain Size	
Austenitic	Ferritic
7	

Macrostructure (ASTM E381)		
S	R	C

Magnetic Particle Inspection	
Frequency	Severity

Mechanical Properties (ASTM A370)

Tensile Properties					Hardness	
Tensile Strength	0.2% Yield Strength	% Elong (2")	% ROA	0.35% EUL Yield Strength	(MR)	(Surf)

Steel Dynamics - Engineered Bar Products has a quality system in place which has been certified ISO 9001:2008 compliant, including PED certification.

Comments/Specs

ASTM A322-07 ---- Quench & Temper, Straighten, Stress Relieve ---- Contact Ultrasonic Inspected to 1/0" FBI ---- ASTM A354 Grade BD

QA
Date 8/31/11
Batch # H208

Condition : Quench, Temper, Tempor, Straighten, Straighten, Stress Relieve, Contact UT

UT: Passed Ultrasonic Inspection

I hereby certify that the content of this report is correct and accurate, and that all tests and operations performed on this material were in compliance with applicable material specifications and purchaser designated requirements.

Dylan Kale - Rolling Mill Metallurgist

Any alteration to this report voids Steel Dynamic's warranting of results. No weld repair has been performed on this material. This material is not radioactive and has not been exposed to radioactivity while under the control of Steel Dynamics. This material has not been exposed to mercury while under the control of Steel Dynamics. Unless otherwise noted, this material was melted, continuously cast, and rolled in the USA; w/ all testing performed by Steel Dynamics.

CODE 01G

Certified Material Test Report

Heat Treatment Addendum

Coil # : 117655	Mill Order : 1109058	Heat # : A113149	Issued : 8/29/2011
Work Order : 115418	Sales Order : 95886	Customer : Turret Steel Industries	PO # : 33033 / 1
Load # :	Reference # :	Reference Desc :	End Use :
Size : 3-3/4"	Shape : Round	Grade : 4140	Length : 32'00"

Normalize		Austenitize		Quench Media			Temper		Stress Relieve	
Time	Temp	Time	Temp	Type	Time	Temp	Time	Temp	Time	Temp
hrs	F	2.5 hrs	1650 F	Water	15 min	95-99 F	6.3 hrs	1025 F	5.0 hrs	900 F

* Furnaces are calibrated to API 6A Annex P, and use atmospheric thermocouples
 ** QTC is 12" prolongation from longitudinal orientation machined to a 0.505" buttonhead for tensile.

Hardness (ASTM A370)

Bundle #	Batch #	Location	HB	Rb	Rc
1138928	H200	Mid-Rad Q1			35
1138926	H210	Mid-Rad Q1			35
1138927	H210	Mid-Rad Q1			35
1130929	H222	Mid-Rad Q1			36

Tensile (ASTM A376)

Bundle #	Batch #	Orientation	Location	Tensile	0.2% Yield	%E (2")	%ROA
1130928	H200	Longitudinal	Mid-Rad Q1	153,800 psi	132,400 psi	10	52
1138926	H210	Longitudinal	Mid-Rad Q1	155,700 psi	134,500 psi	15	51
1138927	H210	Longitudinal	Mid-Rad Q1	155,700 psi	134,500 psi	15	51
1138929	H222	Longitudinal	Mid-Rad Q1	155,500 psi	134,500 psi	15	52

8/31/11

I hereby certify that the content of this report is correct and accurate, and that all tests and operations performed on this material were in compliance with applicable material specifications and purchaser designated requirements.

Garrett Bouyett
 Garrett Bouyett - Bar Finishing Metallurgist

Any alteration to this report voids Steel Dynamic's warranting of results.

Certified Material Test Report

Carl #: 117655	Mill Order: 1100058	Heat #: A113149	Issued: 8/30/2011 09:38:57
Work Order: 115418	Sales Order: 95686-1	Customer: Turret Steel Industries	PO #: 33833-1
Load #: 141557	Reference #:	Reference Desc:	End Use:
Size: 3-3/4"	Shape: Round	Grade: 4140	Length: 32'00"
Grain Practice: A1 Fine Grain (5-8) per ASTM A29		Reduction Ratio: 12.0 to 1	Disposition: 1

Ladle Chemistry Analysis (ASTM A29)

C	Mn	P	S	Si	Al	Cu	Ni	Cr	Mo	Sn	N	V	Cb	B	Ca	W	Ti	Oi
0.41	0.95	0.009	0.006	0.27	0.025	0.18	0.16	0.99	0.22	0.011	0.0069	0.004	0.002	0.0001	0.0013	0.000	0.002	6.31
Pb	Co	As	Sb	Zr	Bi	H	O	Coq	J-Factor									
0.001	0.088	0.005	0.003	0.001	0.001	1.6		0.04										

Product Check Analysis (ASTM A29)

	C	Mn	P	S	Si	Al	Cu	Ni	Cr	Mo	Sn	N	V	Cb	Ti	B	Ca	O
Front																		
Back																		

Jominy (ASTM A255)

	J1	J2	J3	J4	J5	J6	J7	J8	J9	J10	J12	J14	J16	J18	J20	J24	J28	J32
Calc'd	57	57	57	57	57	57	57	57	57	57	55	52	50	50	49	48	47	43
Front																		
Back																		

Microcleanliness (ASTM E45)

Method A								Method C		Method E	
AT	AH	BT	BH	CT	CH	DT	DH	S	O	SAM "B"	SAM "D"

Microcleanliness (DIN 50602)

K		M	
S	O	Tot	Tot

Decarb		Grain Size		Macrostructure (ASTM E381)			Magnetic Particle Inspection	
Depth	% of Diameter	Austenitic	Ferritic	S	R	C	Frequency	Severity
		7						

Mechanical Properties (ASTM A370)

Tensile Properties					Hardness	
Tensile Strength	0.2% Yield Strength	% Elong (2")	% ROA	0.35% EUL Yield Strength	(MR)	(Surf)

Steel Dynamics - Engineered Bar Products has a quality system in place which has been certified ISO 9001:2008 compliant, including PED certification.

Comments/Specs

ASTM A322-07 ----- Quench & Temper, Straighten, Stress Relieve ----- Contact Ultrasonic Inspected to 1/0" FBH ----- ASTM A354 Grade BC

QA
8/31/11
Batch # H 210

Condition: Quench, Temper, Temper, Straighten, Straighten, Stress Relieve, Contact UT

UT: Passed Ultrasonic Inspection

I hereby certify that the content of this report is correct and accurate, and that all tests and operations performed on this material were in compliance with applicable material specifications and purchaser designated requirements.

Dylan Kala - Rolling Mill Metallurgist

Any alteration to this report voids Steel Dynamic's warranting of results. No weld repair has been performed on this material. This material has not been exposed to radioactive while under the control of Steel Dynamics. This material has not been exposed to mercury while under the control of Steel Dynamics. Unless otherwise noted, this material was melted, continually cast, and rolled in the USA; w/ all testing performed by Steel Dynamics.

CODE 0YH

Certified Material Test Report

Heat Treatment Addendum

Carl #: 117655	Mill Order: 1109058	Heat #: A113149	Issued: 07/29/2011
Work Order: 115418	Sales Order: 95886	Customer: Turrel Steel Industries	PO #: 33033 / 1
Load #:	Reference #:	Reference Desc:	End Use:
Size: 3-3/4"	Shape: Round	Grade: 4140	Length: 32'00"

Normalize		Austenitize		Quench Media		Temper		Stress Relieve		
Time	Temp	Time	Temp	Type	Time	Temp	Time	Temp	Time	Temp
hrs	F	2.5 hrs	1650 F	Water	15 min	95-99 F	6.3 hrs	1025 F	5.0 hrs	900 F

* Furnaces are calibrated to API 6A Annex P, and use atmospheric thermocouples
 ** QTC is 12" prolongation from longitudinal orientation machined to a 0.505" buttonhead for tensile.

Hardness (ASTM A370)

Bundle #	Batch #	Location	HB	Rb	Rc
1138928	H200	Mid-Rad Q1			35
1138926	H210	Mid-Rad Q1			35
1138927	H210	Mid-Rad Q1			35
1138929	H222	Mid-Rad Q1			36

Tensile (ASTM A370)

Bundle #	Batch #	Orientation	Location	Tensile	0.2% Yield	%E (2')	%RA
1138928	H200	Longitudinal	Mid-Rad Q1	153,000 psi	132,400 psi	16	52
1138926	H210	Longitudinal	Mid-Rad Q1	155,700 psi	134,500 psi	15	51
1138927	H210	Longitudinal	Mid-Rad Q1	155,700 psi	134,500 psi	15	51
1138929	H222	Longitudinal	Mid-Rad Q1	155,500 psi	134,500 psi	15	52

QA
8/31/11

I hereby certify that the content of this report is correct and accurate, and that all tests and operations performed on this material were in compliance with applicable material specifications and purchaser designated requirements.

Garrett Bouyeit
 Garrett Bouyeit - Bar Finishing Metallurgist

Any alteration to this report voids Steel Dynamic's warranting of results.

CODE 0YI

Certified Material Test Report

Coil #: 117655	Mill Order: 1109050	Heat #: A113148	Issued: 8/30/2011 09:38:57
Work Order: 115418	Sales Order: 95006-1	Customer: Turret Steel Industries	PO #: 33033-1
Load #: 141557	Reference #:	Reference Desc:	End Use:
Size: 3-3/4"	Shape: Round	Grade: 4140	Length: 32'00"
Grain Practice: A1 Fine Grain (5-8) per ASTM A29		Reduction Ratio: 12.9 to 1	Disposition: 1

Ladle Chemistry Analysis (ASTM A29)

C	Mn	P	S	Si	Al	Cu	Ni	Cr	Mo	Sn	N	V	Cb	B	Co	W	Ti	DI
0.41	0.95	0.009	0.006	0.27	0.025	0.18	0.16	0.99	0.22	0.011	0.0069	0.004	0.002	0.0001	0.0013	0.000	0.002	6.31
Pb	Co	As	Sb	Zr	Bi	H	O	Coq	J-Factor									
0.001	0.000	0.005	0.003	0.001	0.001	1.6		0.84										

Product Check Analysis (ASTM A29)

	C	Mn	P	S	Si	Al	Cu	Ni	Cr	Mo	Sn	N	V	Cb	Ti	B	Ca	O
Front																		
Back																		

Jominy (ASTM A255)

	J1	J2	J3	J4	J5	J6	J7	J8	J9	J10	J12	J14	J16	J18	J20	J24	J28	J32
Calc'd	57	57	57	57	57	57	57	57	57	57	55	52	50	50	49	48	47	43
Front																		
Back																		

Microcleanliness (ASTM E45)

Method A								Method C			Method E		
AT	AH	DT	BH	CT	CH	DT	DH	S	O	SAM "B"	SAM "D"		

Microcleanliness (DIN 50602)

K			H	
S	O	Tot	Tot	

Decarb

Depth	% of Diameter

Grain Size

Austenitic	Ferritic
7	

Macrostructure (ASTM E381)

S	R	C

Magnetic Particle Inspection

Frequency	Severity

Mechanical Properties (ASTM A370)

Tensile Properties					Hardness	
Tensile Strength	0.2% Yield Strength	% Elong (2")	% ROA	0.35% EUL Yield Strength	(MR)	(Surf)

Steel Dynamics - Engineered Bar Products has a quality system in place which has been certified ISO 9001:2008 compliant, including PED certification.

Comments/Notes

ASTM A322-07 ----- Quench & Temper, Straighten, Stress Relieve ----- Contact Ultrasonic Inspected to 1/8" FBH ----- ASTM A354 Grade BD

Handwritten signature
8/31/11

Batch # H222

Condition: Quench, Temper, Temper, Straighten, Straighten, Stress Relieve, Contact UT

UT Passed Ultrasonic Inspection

I hereby certify that the content of this report is correct and accurate, and that all tests and operations performed on this material were in compliance with applicable material specifications and purchaser designated requirements.

Dylan Kala - Rolling Mill Metallurgist

Any alteration to this report voids Steel Dynamic's warranting of results. No weld repair has been performed on this material. This material is not radioactive and has not been exposed to radioactivity while under the control of Steel Dynamics. This material has not been exposed to mercury while under the control of Steel Dynamics. Unless otherwise noted, this material was melted, continuously cast, and rolled in the USA; w/ all testing performed by Steel Dynamics.

CODE 04I

Certified Material Test Report

Heat Treatment Addendum

Cert #: 117655	Mill Order: 1109058	Heat #: A113149	Issued: 8/29/2011
Work Order: 115418	Sales Order: 95886	Customer: Turrel Steel Industries	PO #: 33033 / 1
Load #:	Reference #:	Reference Desc:	End Use:
Size: 3-3/4"	Shape: Round	Grade: 4140	Length: 32'00"

Normalize		Austenitize		Quench Media		Temper		Stress Relieve		
Time	Temp	Time	Temp	Type	Time	Temp	Time	Temp	Time	Temp
hrs	F	2.5 hrs	1650 F	Water	15 min	95-99 F	6.0 hrs	1025 F	5.0 hrs	900 F

* Furnaces are calibrated to API 6A Annex P, and use atmospheric thermocouples
 ** QTC is 12" prolongation from longitudinal orientation machined to a 0.505" buttonhead for tensile.

Hardness (ASTM A370)

Bundle #	Batch #	Location	HB	Rb	Rc
1138920	H200	Mid-Rad Q1			35
1138926	H210	Mid-Rad Q1			35
1138927	H210	Mid-Rad Q1			35
1138929	H222	Mid-Rad Q1			36

Tensile (ASTM A370)

Bundle #	Batch #	Orientation	Location	Tensile	0.2% Yield	%E (2")	%RA
1138920	H200	Longitudinal	Mid-Rad Q1	153,800 psi	132,400 psi	16	52
1138926	H210	Longitudinal	Mid-Rad Q1	155,700 psi	134,500 psi	15	51
1138927	H210	Longitudinal	Mid-Rad Q1	165,700 psi	134,500 psi	15	51
1138929	H222	Longitudinal	Mid-Rad Q1	155,500 psi	134,500 psi	15	52

QA
8/31/11

I hereby certify that the content of this report is correct and accurate, and that all tests and operations performed on this material were in compliance with applicable material specifications and purchaser designated requirements.

Garrett Buryell
 Garrett Buryell - Bar Finishing Metallurgist

Any alteration to this report voids Steel Dynamic's warranting of results.

CODE 04J

Certified Material Test Report

Cert #: 116463	Mill Order: 1109059	Heat #: A113151	Issued: 8/30/2011 00:30:57
Work Order: 115410	Sales Order: 95886-1	Customer: Turret Steel Industries	PO #: 33033-1
Load #: 141557	Reference #:	Reference Desc:	End Use:
Size: 3-3/4"	Shape: Round	Grade: 4140	Length: 32'00"
Grain Practice: A1 Fine Grain (5-B) per ASTM A29		Reduction Ratio: 12.9 to 1	Disposition: 1

Ladle Chemistry Analysis (ASTM A29)

C	Mn	P	S	Si	Al	Cu	Ni	Cr	Mo	Sn	N	V	Cb	B	Ca	W	Ti	DI
0.40	0.96	0.009	0.005	0.25	0.024	0.20	0.07	0.98	0.22	0.011	0.0081	0.004	0.002	0.0001	0.0009	0.000	0.001	6.09
Pb	Co	As	Sb	Zr	Bi	H	O	Ceq	J-Factor									
0.001	0.008	0.005	0.003	0.001	0.000	1.4		0.02										

Product Check Analysis (ASTM A29)

	C	Mn	P	S	Si	Al	Cu	Ni	Cr	Mo	Sn	N	V	Cb	Ti	B	Ca	O
Front																		
Back																		

Jominy (ASTM A255)

	J1	J2	J3	J4	J5	J6	J7	J8	J9	J10	J12	J14	J16	J18	J20	J24	J28	J32
Calc'd	56	56	56	56	50	58	55	56	56	54	50	51	40	48	47	46	45	41
Front																		
Back																		

Microcleanliness (ASTM E45)

Method A								Method C		Method E	
AT	AH	BT	BH	CT	CH	DT	DH	S	O	SAM "B"	SAM "D"

Microcleanliness (DIN 50602)

K			M	
S	U	Tot	Tot	

Decarb

Depth	% of Diameter

Grain Size

Austenitic	Ferritic
7	

Macrostructure (ASTM E381)

S	R	C

Magnetic Particle Inspection

Frequency	Severity

Mechanical Properties (ASTM A370)

Tensile Properties					Hardness	
Tensile Strength	0.2% Yield Strength	% Elong (2")	% ROA	0.35% EUL Yield Strength	(MR)	(Surf)

Steel Dynamics - Engineered Bar Products has a quality system in place which has been certified ISO 9001:2008 compliant, including PED certification.

Comments/Specs

ASTM A322-07 ----- Quench & Temper, Straighten, Stress Relieve ----- Contact Ultrasonic Inspected to 1/8" FBH ----- ASTM A354 Grade BD

Handwritten: 8/31/11
Batch # H 207

Condition : Quench, Temper, Temper, Straighten, Stress Relieve, Contact UT UT: Passed Ultrasonic Inspection

I hereby certify that the content of this report is correct and accurate, and that all tests and operations performed on this material were in compliance with applicable material specifications and purchaser designated requirements.

Dylan Kate - Rolling Mill Metallurgist

Any alteration to this report voids Steel Dynamic's warranting of results. No weld repair has been performed on this material. This material is not radioactive and has not been exposed to radioactivity while under the control of Steel Dynamics. This material has not been exposed to mercury while under the control of Steel Dynamics. Unless otherwise noted, this material was melted, continuously cast, and rolled in the USA; w/ all testing performed by Steel Dynamics.

CODE 04J

Certified Material Test Report

Heat Treatment Addendum

Cert #: 116463	Mill Order: 1100059	Heat #: A113151	Issued: 8/29/2011
Work Order: 115418	Sales Order: 95886	Customer: Turret Steel Industries	PO #: 33033 / 1
Load #:	Reference #:	Reference Desc:	End Use:
Size: 3-3/4"	Shape: Round	Grade: 4140	Length: 32'00"

Normalize		Austenitize		Quench Media			Temper		Stress Relieve	
Time	Temp	Time	Temp	Type	Time	Temp	Time	Temp	Time	Temp
hrs	°F	hrs	°F		min	°F	hrs	°F	hrs	°F
		2.5	1650	Water	15	95-99	6.3	1025	5.0	900

* Furnaces are calibrated to API 6A Annex P, and use atmospheric thermocouples
 ** QTC is 12" elongation from longitudinal orientation machined to a 0.505" buttonhead for tensile.

Hardness (ASTM A370)

Bundle #	Batch #	Location	HB	Rb	Rc
1138941	H207	Mid-Rnd Q1			36
1138943	H207	Mid-Rnd Q1			36
1138939	H200	Mid-Rnd Q1			36
1138933	H211	Mid-Rnd Q1			36
1138931	H211	Mid-Rnd Q1			36
1138932	H214	Mid-Rnd Q1			36
1138931	H214	Mid-Rnd Q1			36
1138944	H215	Mid-Rnd Q1			36
1138936	H215	Mid-Rnd Q1			36
1138942	H217	Mid-Rnd Q1			36
1138940	H217	Mid-Rnd Q1			30
1138940	H222	Mid-Rnd Q1			36

Tensile (ASTM A370)

Bundle #	Batch #	Orientation	Location	Tensile	0.2% Yield	%E (2")	%RA
1138941	H207	Longitudinal	Mid-Rnd Q1	147,600 psi	124,200 psi	10	51
1138943	H207	Longitudinal	Mid-Rnd Q1	147,600 psi	124,200 psi	10	54
1138939	H200	Longitudinal	Mid-Rnd Q1	151,700 psi	129,700 psi	16	54
1138933	H211	Longitudinal	Mid-Rnd Q1	147,100 psi	123,200 psi	10	54
1138931	H211	Longitudinal	Mid-Rnd Q1	147,100 psi	123,200 psi	16	54
1138932	H214	Longitudinal	Mid-Rnd Q1	151,600 psi	128,000 psi	16	53
1138931	H214	Longitudinal	Mid-Rnd Q1	151,600 psi	128,000 psi	16	53
1138944	H215	Longitudinal	Mid-Rnd Q1	156,500 psi	135,300 psi	10	53
1138936	H215	Longitudinal	Mid-Rnd Q1	156,500 psi	135,300 psi	16	53
1138942	H217	Longitudinal	Mid-Rnd Q1	152,000 psi	130,000 psi	15	52
1138949	H217	Longitudinal	Mid-Rnd Q1	152,000 psi	130,000 psi	15	52
1138948	H222	Longitudinal	Mid-Rnd Q1	140,200 psi	125,300 psi	10	55

Garroll Bouyeil
 8/31/11

I hereby certify that the content of this report is correct and accurate, and that all tests and operations performed on this material were in compliance with applicable material specifications and purchaser designated requirements.

Garroll Bouyeil
 Garroll Bouyeil - Bar Finishing Metallurgist

Any alteration to this report voids Steel Dynamic's warranting of results.

CODE OYK

Certified Material Test Report

Cart #: 115463	Mill Order: 1109059	Heat #: A113151	Issued: 8/30/2011 09:30:57
Work Order: 115410	Sales Order: 95886-1	Customer: Turret Steel Industries	PO #: 33033-1
Load #: 141557	Reference #:	Reference Desc:	End Use:
Size: 3-3/4"	Shape: Round	Grade: 4140	Length: 32'00"
Grain Practice: AI Fine Grain (5-8) per ASTM A29		Reduction Ratio: 12.9 to 1	Disposition: 1

Ladle Chemistry Analysis (ASTM A29)

C	Mn	P	S	Si	Al	Cu	Ni	Cr	Mo	Sn	N	V	Cb	B	Ca	W	Ti	DI
0.40	0.96	0.009	0.005	0.25	0.024	0.20	0.07	0.98	0.22	0.011	0.0081	0.004	0.002	0.0001	0.0009	0.000	0.001	6.09
Pb	Co	As	Sb	Zr	Bi	H	O	Coq	J-Factor									
0.001	0.008	0.005	0.003	0.001	0.000	1.4		0.62										

Product Check Analysis (ASTM A29)

	C	Mn	P	S	Si	Al	Cu	Ni	Cr	Mo	Sn	H	V	Cb	Ti	B	Ca	O
Front																		
Back																		

Jominy (ASTM A255)

	J1	J2	J3	J4	J5	J6	J7	J8	J9	J10	J12	J14	J16	J18	J20	J24	J28	J32
Calc'd	56	56	56	56	56	56	56	56	56	54	50	51	48	40	47	46	45	41
Front																		
Back																		

Microcleanliness (ASTM E45)

Method A								Method C		Method E	
AT	AH	BT	BH	CT	CH	DT	DH	S	O	SAM "B"	SAM "D"

Microcleanliness (DIN 50602)

K			M	
S	U	Tot	Tot	

Decarb

Depth	% of Diameter

Grain Size

Austenitic	Ferritic

Macrostructure (ASTM E301)

S	R	C

Magnetic Particle Inspection

Frequency	Severity

Mechanical Properties (ASTM A370)

Tensile Properties					Hardness	
Tensile Strength	0.2% Yield Strength	% Elong (2")	% ROA	0.35% EUL Yield Strength	(MR)	(Surf)

Steel Dynamics - Engineered Bar Products has a quality system in place which has been certified ISO 9001:2008 compliant, including PEO certification.

Comments/Specs

ASTM A322-07 ----- Quench & Temper, Straighten, Stress Relieve ----- Contact Ultrasonic Inspected to 1/8" FDH ----- ASTM A354 Grade BD

QA
8/31/11
Batch # H208

Condition: Quench, Temper, Temper, Straighten, Stress Relieve, Contact UT

UT: Passed Ultrasonic Inspection

I hereby certify that the content of this report is correct and accurate, and that all tests and operations performed on this material were in compliance with applicable material specifications and purchaser designated requirements.

Dylan Kate - Rolling Mill Metallurgist

Any alteration to this report voids Steel Dynamic's warranting of results. No weld repair has been performed on this material. This material is not radioactive and has not been exposed to radioactivity while under the control of Steel Dynamics. This material has not been exposed to mercury while under the control of Steel Dynamics. Unless otherwise noted, this material was melted, continuously cast, and rolled in the USA; w/ all testing performed by Steel Dynamics.

CODE 0YK

Certified Material Test Report

Heat Treatment Addendum

Cert # : 116463	Mill Order : 1100050	Heat # : A113151	Issued : 0/29/2011
Work Order : 115410	Sales Order : 95885	Customer : Turret Steel Industries	PO # : 33033 / 1
Load # :	Reference # :	Reference Desc :	End Use :
Size : 3-3/4"	Shape : Round	Grade : 4140	Length : 32'00"

Normalize		Austenitize		Quench Media			Temper		Stress Relieve	
Time	Temp	Time	Temp	Type	Time	Temp	Time	Temp	Time	Temp
hrs	°F	2.5 hrs	1650 °F	Water	15 min	95-99 °F	6.3 hrs	1025 °F	5.0 hrs	900 °F

* Furnaces are calibrated to API 6A Annex P, and use atmospheric thermocouples
 ** QTC is 12" elongation from longitudinal orientation machined to a 0.505" buttonhead for tensile.

Hardness (ASTM A370)

Bundle #	Batch #	Location	HB	Rb	Rc
1138941	H207	Mid-Rnd O1			36
1130943	H207	Mid-Rnd O1			36
1130939	H200	Mid-Rnd O1			36
1130933	H211	Mid-Rnd O1			36
1138934	H211	Mid-Rnd O1			36
1138932	H214	Mid-Rnd O1			36
1138931	H214	Mid-Rnd O1			36
1138944	H215	Mid-Rnd O1			36
1130936	H215	Mid-Rnd O1			36
1130942	H217	Mid-Rnd O1			36
1130949	H217	Mid-Rnd O1			36
1130940	H222	Mid-Rnd O1			36

Tensile (ASTM A370)

Bundle #	Batch #	Orientation	Location	Tensile	0.2% Yield	%E (2")	%ROA
1138941	H207	Longitudinal	Mid-Rnd O1	147,600 psi	124,200 psi	16	54
1138943	H207	Longitudinal	Mid-Rnd O1	147,600 psi	124,200 psi	16	54
1130939	H200	Longitudinal	Mid-Rnd O1	151,700 psi	129,700 psi	16	54
1130933	H211	Longitudinal	Mid-Rnd O1	147,100 psi	123,200 psi	16	54
1138934	H211	Longitudinal	Mid-Rnd O1	147,100 psi	123,200 psi	16	54
1138932	H214	Longitudinal	Mid-Rnd O1	151,600 psi	128,800 psi	16	53
1138931	H214	Longitudinal	Mid-Rnd O1	151,600 psi	128,900 psi	16	53
1138944	H215	Longitudinal	Mid-Rnd O1	156,500 psi	135,300 psi	16	53
1130936	H215	Longitudinal	Mid-Rnd O1	156,500 psi	135,300 psi	16	53
1130942	H217	Longitudinal	Mid-Rnd O1	152,000 psi	130,000 psi	15	52
1130949	H217	Longitudinal	Mid-Rnd O1	152,000 psi	130,000 psi	15	52
1138948	H222	Longitudinal	Mid-Rnd O1	148,200 psi	125,300 psi	16	55

GA
8/31/11

I hereby certify that the content of this report is correct and accurate, and that all tests and operations performed on this material were in compliance with applicable material specifications and purchaser designated requirements.

Garrall Bouyell
 Garrall Bouyell • Bar Finishing Metallurgist

Any alteration to this report voids Steel Dynamic's warranting of results.

Certified Material Test Report

Cert # : 116463	Mill Order : 1109059	Heat # : A113151	Issued : 8/30/2011 09:38:57
Work Order : 115418	Sales Order : 85886-1	Customer : Turret Steel Industries	PO # : 33033-1
Load # : 141557	Reference # :	Reference Desc :	End Use :
Size : 3-3/4"	Shape : Round	Grade : 4140	Length : 32'00"
Grain Practice : Al Fine Grain (5-8) per ASTM A29		Reduction Ratio : 12.9 to 1	Disposition : 1

Ladle Chemistry Analysis (ASTM A29)

C	Mn	P	S	Si	Al	Cu	Ni	Cr	Mo	Sn	N	V	Cb	B	Ca	W	Ti	DL
0.40	0.96	0.009	0.005	0.25	0.024	0.20	0.07	0.98	0.22	0.011	0.0081	0.004	0.002	0.0001	0.0009	0.000	0.001	6.09
Pb	Co	As	Sb	Zr	Bi	H	O	Coq	J-Factor									
0.001	0.008	0.005	0.003	0.001	0.000	1.4		0.82										

Product Check Analysis (ASTM A29)

	C	Mn	P	S	Si	Al	Cu	Ni	Cr	Mo	Sn	N	V	Cb	Ti	B	Ca	O
Front																		
Back																		

Jominy (ASTM A255)

	J1	J2	J3	J4	J5	J6	J7	J8	J9	J10	J12	J14	J16	J18	J20	J24	J28	J32
Calc'd	56	56	56	56	56	56	56	56	56	54	50	51	48	48	47	46	45	41
Front																		
Back																		

Microcleanliness (ASTM E45)

Method A								Method C		Method E	
AT	AH	BT	BH	CT	CH	DT	DH	S	O	SAM "B"	SAM "D"

Microcleanliness (DIN 50602)

K			M
S	U	Tot	Tot

Decarb		Grainsize		Macrostructure (ASTM E381)			Magnetic Particle Inspection	
Depth	% of Diameter	Austenitic	Ferritic	S	R	C	Frequency	Severity
		7						

Mechanical Properties (ASTM A370)

Tensile Properties					Hardness	
Tensile Strength	0.2% Yield Strength	% Elong (2")	% ROA	0.35% EUL Yield Strength	(MR)	(Surf)

Steel Dynamics - Engineered Bar Products has a quality system in place which has been certified ISO 9001:2008 compliant, including PED certification.

Comments/Specs

ASTM A322-07 ----- Quench & Temper, Straighten, Stress Relieve ----- Contact Ultrasonic Inspected to 1/8" FDH ----- ASTM A354 Grade BD

[Handwritten Signature]
8/31/11
Batch # H211

Condition : Quench, Temper, Temper, Straighten, Stress Relieve, Contact UT UT. Passed Ultrasonic Inspection

I hereby certify that the content of this report is correct and accurate, and that all tests and operations performed on this material were in compliance with applicable material specifications and purchaser designated requirements.

Dylan Kite - Rolling Mill Metallurgist

Any alteration to this report voids Steel Dynamic's warranting of results. No weld repair has been performed on this material. This material is not radioactive and has not been exposed to radioactivity while under the control of Steel Dynamics. This material has not been exposed to mercury while under the control of Steel Dynamics. Unless otherwise noted, this material was milled, continually cast, and rolled in the USA; w/ all testing performed by Steel Dynamics.

CODE OYL

Certified Material Test Report

Heat Treatment Addendum

Cert #: 116463	Mill Order: 1100050	Heat #: A113151	Issued: 8/28/2011
Work Order: 115410	Seles Order: 95886	Customer: Turret Steel Industries	PO #: 33033 / 1
Load #:	Reference #:	Reference Desc:	End Use:
Size: 3-3/4"	Shape: Round	Grade: 4140	Length: 32'00"

Normalize		Austenitize		Quench Media			Temper		Stress Relieve	
Time	Temp	Time	Temp	Type	Time	Temp	Time	Temp	Time	Temp
hrs	°F	2.5 hrs	1650 °F	Water	15 min	95-99 °F	6.3 hrs	1025 °F	5.0 hrs	900 °F
* Furnaces are calibrated to API 6A Annex P, and use atmospheric thermocouples										
** QTC is 12" prolongation from longitudinal orientation machined to a 0.505" buttonhead for tensile.										

Hardness (ASTM A370)

Bundle #	Batch #	Location	HB	Rb	Rc
1138941	H207	Mid-Rad Q1			36
1138943	H207	Mid-Rad Q1			36
1138939	H208	Mid-Rad Q1			36
1138933	H211	Mid-Rad Q1			30
1138934	H211	Mid-Rad Q1			36
1138932	H214	Mid-Rad Q1			36
1138931	H214	Mid-Rad Q1			36
1138944	H215	Mid-Rad Q1			36
1138936	H215	Mid-Rad Q1			36
1138942	H217	Mid-Rad Q1			36
1138949	H217	Mid-Rad Q1			36
1138948	H222	Mid-Rad Q1			36

Tensile (ASTM A370)

Bundle #	Batch #	Orientation	Location	Tensile	0.2% Yield	%E (2")	%ROA
1138941	H207	Longitudinal	Mid-Rad Q1	147,600 psi	124,200 psi	16	54
1138943	H207	Longitudinal	Mid-Rad Q1	147,600 psi	124,200 psi	16	54
1138939	H208	Longitudinal	Mid-Rad Q1	151,700 psi	120,700 psi	16	54
1138933	H211	Longitudinal	Mid-Rad Q1	147,100 psi	123,200 psi	16	54
1138934	H211	Longitudinal	Mid-Rad Q1	147,100 psi	123,200 psi	16	54
1138932	H214	Longitudinal	Mid-Rad Q1	151,600 psi	120,900 psi	16	63
1138931	H214	Longitudinal	Mid-Rad Q1	151,600 psi	120,900 psi	16	53
1138944	H215	Longitudinal	Mid-Rad Q1	150,500 psi	135,300 psi	16	53
1138936	H215	Longitudinal	Mid-Rad Q1	156,500 psi	135,300 psi	16	53
1138942	H217	Longitudinal	Mid-Rad Q1	152,000 psi	130,000 psi	15	52
1138949	H217	Longitudinal	Mid-Rad Q1	152,000 psi	130,000 psi	15	52
1138948	H222	Longitudinal	Mid-Rad Q1	148,200 psi	125,300 psi	16	55

Garrett Bouyell
 8/28/11

I hereby certify that the content of this report is correct and accurate, and that all tests and operations performed on this material were in compliance with applicable material specifications and purchaser designated requirements.

Garrett Bouyell
 Garrett Bouyell - Bar Finishing Metalurgist

Any alteration to this report voids Steel Dynamic's warranting of results.

CODE OYM

Certified Material Test Report

Coil #: 116463	Mill Order: 1109059	Heat #: A113151	Issued: 8/30/2011 09:30:57
Work Order: 115418	Sales Order: 95886-1	Customer: Turret Steel Industries	PO #: 33033-1
Load #: 141557	Reference #:	Reference Desc:	End Use:
Size: 3-3/4"	Shape: Round	Grade: 4140	Length: 32'00"
Grain Practice: A1 Fine Grain (5-8) per ASTM A29		Reduction Ratio: 12.9 to 1	Disposition: 1

Ladle Chemistry Analysis (ASTM A29)

C	Mn	P	S	Si	Al	Cu	Ni	Cr	Mo	Sn	N	V	Cb	B	Ca	W	Ti	DI
0.40	0.96	0.009	0.005	0.25	0.024	0.20	0.07	0.98	0.22	0.011	0.0081	0.004	0.002	0.0001	0.0009	0.000	0.001	6.09
Pb	Co	As	Sb	Zn	Bi	H	O	Ceq	J-Factor									
0.001	0.008	0.005	0.003	0.001	0.000	1.4		0.82										

Product Check Analysis (ASTM A29)

	C	Mn	P	S	Si	Al	Cu	Ni	Cr	Mo	Sn	H	V	Cb	Ti	B	Ca	O
Front																		
Back																		

Jominy (ASTM A255)

	J1	J2	J3	J4	J5	J6	J7	J8	J9	J10	J12	J14	J16	J18	J20	J24	J28	J32
Calc'd	56	56	56	56	56	56	56	56	56	54	50	51	48	48	47	46	45	41
Front																		
Back																		

Microcleanliness (ASTM E45)

Method A								Method C		Method E	
AT	AH	D1	DH	CT	CH	DT	DH	S	C	SAH "B"	SAM "D"

Microcleanliness (DIN 50602)

K			M
S	U	Tot	Tot

Decarb

Depth	% of Diameter

Grainsize

Austenitic	Ferritic

Macrostructure (ASTM E301)

S	R	C

Magnetic Particle Inspection

Frequency	Severity

Mechanical Properties (ASTM A370)

Tensile Properties					Hardness	
Tensile Strength	0.2% Yield Strength	% Elong (2")	% ROA	0.35% EUL Yield Strength	(MR)	(Surf)

Steel Dynamics - Engineered Bar Products has a quality system in place which has been certified ISO 9001:2008 standard, including PED certification.

Comments/Specs

ASTM A322-07 ----- Quench & Temper, Straighten, Stress Relieve ----- Contact Ultrasonic Inspected to 1/8" FBH ----- ASTM A351 Grade BD

QA
8/31/11

Batch # H214

Condition: Quench, Temper, Temper, Straighten, Stress Relieve, Contact UT

UT: Passed Ultrasonic Inspection

I hereby certify that the content of this report is correct and accurate, and that all tests and operations performed on this material were in compliance with applicable material specifications and purchaser designated requirements.

Dylan Kite - Rolling Mill Metallurgist I

Any alteration to this report voids Steel Dynamic's warranting of results. No weld repair has been performed on this material. This material is not radioactive and has not been exposed to radioactivity while under the control of Steel Dynamics. This material has not been exposed to mercury while under the control of Steel Dynamics. Unless otherwise noted, this material was melted, continuously cast, and rolled in the USA; with testing performed by Steel Dynamics.

CODE OYM

Certified Material Test Report

Heat Treatment Addendum

Cert #: 116463	Mill Order: 1100050	Heat #: A113151	Issued: 0/28/2011
Work Order: 115418	Sales Order: 95886	Customer: Turret Steel Industries	PO #: 33033 / 1
Load #:	Reference #:	Reference Desc:	End Use:
Size: 3-3/4"	Shape: Round	Grade: 4140	Length: 32'00"

Normalize		Austenitize		Quench Media		Temper		Stress Relieve		
Time	Temp	Time	Temp	Type	Time	Temp	Time	Temp	Time	Temp
hrs	°F	hrs	°F		min	°F	hrs	°F	hrs	°F
		2.5	1650	Water	15	95-99	6.3	1025	5.0	900

* Furnaces are calibrated to API 6A Annex P, and use atmospheric thermocouples
 ** QTC is 12" prolongation from longitudinal orientation machined to a 0.505" buttonhead for tensile.

Hardness (ASTM A370)

Bundle #	Batch #	Location	HB	Rb	Rc
1130941	H207	Mid-Rad Q1			36
1130943	H207	Mid-Rad Q1			36
1130939	H208	Mid-Rad Q1			36
1130933	H211	Mid-Rad Q1			36
1130934	H211	Mid-Rad Q1			36
1130932	H214	Mid-Rad Q1			36
1130931	H214	Mid-Rad Q1			36
1130944	H215	Mid-Rad Q1			36
1130936	H215	Mid-Rad Q1			36
1130942	H217	Mid-Rad Q1			36
1130949	H217	Mid-Rad Q1			36
1130940	H222	Mid-Rad Q1			36

Tensile (ASTM A370)

Bundle #	Batch #	Orientation	Location	Tensile	0.2% Yield	%E (2")	%RCA
1130941	H207	Longitudinal	Mid-Rad Q1	147,600 psi	124,200 psi	16	54
1130943	H207	Longitudinal	Mid-Rad Q1	147,600 psi	124,200 psi	16	54
1130939	H208	Longitudinal	Mid-Rad Q1	151,700 psi	129,700 psi	16	54
1130933	H211	Longitudinal	Mid-Rad Q1	147,100 psi	123,200 psi	16	54
1130934	H211	Longitudinal	Mid-Rad Q1	147,100 psi	123,200 psi	16	54
1130932	H214	Longitudinal	Mid-Rad Q1	151,600 psi	120,900 psi	16	53
1130931	H214	Longitudinal	Mid-Rad Q1	151,600 psi	120,900 psi	16	53
1130944	H215	Longitudinal	Mid-Rad Q1	156,500 psi	133,300 psi	16	53
1130936	H215	Longitudinal	Mid-Rad Q1	156,500 psi	133,300 psi	16	53
1130942	H217	Longitudinal	Mid-Rad Q1	152,000 psi	130,000 psi	15	52
1130949	H217	Longitudinal	Mid-Rad Q1	152,000 psi	130,000 psi	15	52
1130940	H222	Longitudinal	Mid-Rad Q1	148,200 psi	125,300 psi	16	55

Garrett
 8/31/11

I hereby certify that the content of this report is correct and accurate, and that all tests and operations performed on this material were in compliance with applicable material specifications and purchaser designated requirements.

Garrett Bevel
 Garrett Bevel - Bar Finishing Area Manager

Any alteration to this report voids Steel Dynamic's warranting of results.

Certified Material Test Report

Carl #: 116463	Mill Order: 1109059	Heat #: A113151	Issued: 8/30/2011 09:30:57
Work Order: 115418	Sales Order: 95886-1	Customer: Turret Steel Industries	PO #: 33033-1
Load #: 141557	Reference #:	Reference Desc:	End Use:
Size: 3-3/4"	Shape: Round	Grade: 4140	Length: 32'00"
Grain Practice: Al Fine Grain (5-8) per ASTM A29		Reduction Ratio: 12.9 to 1	Orientation: 1

Ladle Chemistry Analysis (ASTM A29)

C	Mn	P	S	Si	Al	Cu	Ni	Cr	Mo	Sn	N	V	Cb	B	Ca	W	Ti	Bi
0.40	0.06	0.009	0.005	0.25	0.024	0.20	0.07	0.88	0.22	0.011	0.0081	0.004	0.002	0.0001	0.0009	0.000	0.001	6.09
Pb	Co	As	Sb	Zr	Bi	H	O	Coq	J-Factor									
0.001	0.008	0.005	0.003	0.001	0.000	1.4		0.82										

Product Check Analysis (ASTM A29)

	C	Mn	P	S	Si	Al	Cu	Ni	Cr	Mo	Sn	N	V	Cb	Ti	B	Ca	O
Front																		
Back																		

Jominy (ASTM A255)

	J1	J2	J3	J4	J5	J6	J7	J8	J9	J10	J12	J14	J16	J18	J20	J24	J28	J32
Calc'd	56	56	56	56	58	50	56	56	58	54	50	51	48	48	47	46	45	41
Front																		
Back																		

Microcleanliness (ASTM E45)

Method A								Method C			Method E		Microcleanliness (DIN 50602)				
A7	AH	DT	BH	CT	CH	DT	OH	S	O	SAM "B"	SAM "D"	K	M	S	O	Tot	Tot

Decarb		Grainize		Macrostructure (ASTM E381)			Magnetic Particle Inspection	
Depth	% of Diameter	Austenitic	Ferritic	S	R	C	Frequency	Severity
		7						

Mechanical Properties (ASTM A370)

Tensile Properties					Hardness	
Tensile Strength	0.2% Yield Strength	% Elong (2")	% RDA	0.05% EUL Yield Strength	(MR)	(Surf)

Steel Dynamics - Engineered Bar Products has a quality system in place which has been certified ISO 9001:2000 compliant, including PED certification.

Comments/Specs

ASTM A322-07 ----- Quench & Temper, Straighten, Stress Relieve ----- Contact Ultrasonic Inspected to 1/8" FBH ----- ASTM A354 Grade BD

Handwritten:
OK
8/31/11
Batch # H215

Condition: Quench, Temper, Temper, Straighten, Stress Relieve, Contact UT

UT: Passed Ultrasonic Inspection

I hereby certify that the content of this report is correct and accurate, and that all tests and operations performed on this material were in compliance with applicable material specifications and purchaser designated requirements.

Dylan Kule - Rolling Mill Metallurgist

Any alteration to this report voids Steel Dynamics' warranting of results. No weld repair has been performed on this material. This material is not radioactive and has not been exposed to radioactivity while under the control of Steel Dynamics. This material has not been exposed to mercury while under the control of Steel Dynamics. Unless otherwise noted, this material was melted, continuously cast, and rolled in the USA; w/ all testing performed by Steel Dynamics.

CODE 0YN

Certified Material Test Report

Heat Treatment Addendum

Cert #: 116483	Mill Order: 1109059	Heat #: A113151	Issued: 8/29/2011
Work Order: 115410	Sales Order: 95886	Customer: Turret Steel Industries	PO #: 33033 / 1
Load #:	Reference #:	Reference Desc:	End Use:
Size: 3-3/4"	Shape: Round	Grade: 4140	Length: 32'00"

Normalize		Austenitize		Quench Media			Temper		Stress Relieve	
Time	Temp	Time	Temp	Type	Time	Temp	Time	Temp	Time	Temp
hrs	°F	hrs	°F	Water	min	°F	hrs	°F	hrs	°F
		2.5	1650		15	95-99	6.3	1025	5.0	900

* Furnaces are calibrated to API 6A Annex P, and use atmospheric thermocouples
 ** QTC is 12" prolongation from longitudinal orientation machined to a 0.505" buttonhead for tensile.

Hardness (ASTM A370)

Bundle #	Batch #	Location	H _B	R _b	R _c
1138941	H207	Mid-Rad Q1			36
1138943	H207	Mid-Rad Q1			36
1138939	H208	Mid-Rad Q1			36
1138933	H211	Mid-Rad Q1			36
1138934	H211	Mid-Rad Q1			36
1138932	H214	Mid-Rad Q1			36
1138931	H214	Mid-Rad Q1			36
1138944	H215	Mid-Rad Q1			36
1138936	H215	Mid-Rad Q1			36
1138942	H217	Mid-Rad Q1			36
1138940	H217	Mid-Rad Q1			36
1138948	H222	Mid-Rad Q1			36

Tensile (ASTM A370)

Bundle #	Batch #	Orientation	Location	Tensile	0.2% Yield	%E (2")	%ROA
1138941	H207	Longitudinal	Mid-Rad Q1	147,600 psi	124,200 psi	16	54
1138943	H207	Longitudinal	Mid-Rad Q1	147,600 psi	124,200 psi	16	54
1138939	H208	Longitudinal	Mid-Rad Q1	151,700 psi	129,700 psi	16	54
1138933	H211	Longitudinal	Mid-Rad Q1	147,100 psi	123,200 psi	16	54
1138934	H211	Longitudinal	Mid-Rad Q1	147,100 psi	123,200 psi	16	54
1138932	H214	Longitudinal	Mid-Rad Q1	151,600 psi	128,900 psi	16	53
1138931	H214	Longitudinal	Mid-Rad Q1	151,600 psi	128,900 psi	16	53
1138944	H215	Longitudinal	Mid-Rad Q1	156,500 psi	135,300 psi	16	53
1138936	H215	Longitudinal	Mid-Rad Q1	156,500 psi	135,300 psi	16	53
1138942	H217	Longitudinal	Mid-Rad Q1	152,000 psi	130,000 psi	15	52
1138949	H217	Longitudinal	Mid-Rad Q1	152,000 psi	130,000 psi	15	52
1138948	H222	Longitudinal	Mid-Rad Q1	140,200 psi	125,300 psi	16	55

Garrett
8/31/11

I hereby certify that the content of this report is correct and accurate, and that all tests and operations performed on this material were in compliance with applicable material specifications and purchaser designated requirements.

Garrett Boyett
 Garrett Boyett - Bar Finishing Metals Specialist

Any alteration to this report voids Steel Dynamic's warranting of results.

Certified Material Test Report

Coil # : 116463	Mill Order : 1109059	Heat # : A113151	Issued : 8/30/2011 09:38:57
Work Order : 115418	Sales Order : 95885-1	Customer : Turret Steel Industries	PO # : 33033-1
Load # : 141557	Reference # :	Reference Desc :	End Use :
Size : 3-3/4"	Shape : Round	Grade : 4140	Length : 32'00"
Grain Practice : AI Fine Grain (5-8) per ASTM A29		Reduction Ratio : 12.9 to 1	Disposition : 1

Ladle Chemistry Analysis (ASTM A29)

C	Mn	P	S	Si	Al	Cu	Ni	Cr	Mo	Sn	N	V	Cb	B	Co	W	Ti	Bi
0.40	0.96	0.009	0.005	0.25	0.024	0.20	0.07	0.08	0.22	0.011	0.0081	0.004	0.002	0.0001	0.0009	0.000	0.001	6.09
Pb	Co	As	Sb	Zr	Bi	H	O	Ceq	J-Factor									
0.001	0.008	0.005	0.003	0.001	0.000	1.4		0.82										

Product Check Analysis (ASTM A29)

	C	Mn	P	S	Si	Al	Cu	Ni	Cr	Mo	Sn	N	V	Cb	Ti	B	Ca	O
Front																		
Back																		

Jominy (ASTM A255)

	J1	J2	J3	J4	J5	J6	J7	J8	J9	J10	J12	J14	J16	J18	J20	J24	J28	J32
Calc'd	56	56	56	56	56	56	56	56	56	54	50	51	40	48	47	46	45	41
Front																		
Back																		

Microcleanliness (ASTM E45)

Method A								Method C		Method E	
AT	AH	DT	BH	CT	CH	DT	DH	S	O	SAM "B"	SAM "D"

Microcleanliness (DIN 50602)

K			M	
S	O	Tot	Tot	

Decarb

Depth	% of Diameter

Grain Size

Austenitic	Ferritic
7	

Macrostructure (ASTM E381)

S	R	C

Magnetic Particle Inspection

Frequency	Severity

Mechanical Properties (ASTM A370)

Tensile Properties					Hardness	
Tensile Strength	0.2% Yield Strength	% Elong (2")	% ROA	0.05% EUL Yield Strength	(MR)	(Surf)

Steel Dynamics - Engineered Bar Products has a quality system in place which has been certified ISO 9001:2000 compliant, including PED certification.

Comments/Specs

ASTM A322-07 ----- Quench & Temper, Straighten, Stress Relieve ----- Contact Ultrasonic Inspected to 1/0" FBH ----- ASTM A354 Grade BD

QA
8/31/11
Batch # H217

Condition : Quench, Temper, Temper, Straighten, Stress Relieve, Contact UT

UT: Passed Ultrasonic Inspection

I hereby certify that the content of this report is correct and accurate, and that all tests and operations performed on this material were in compliance with applicable material specifications and purchaser designated requirements.

Dylan Knie - Rolling Mill Metallurgist

Any alteration to this report voids Steel Dynamic's warranting of results. No weld repair has been performed on this material. This material is not radioactive and has not been exposed to radioactivity while under the control of Steel Dynamics. This material has not been exposed to mercury while under the control of Steel Dynamics. Unless otherwise noted, this material was melted, continuously cast, and rolled in the USA; w/ all testing performed by Steel Dynamics.

CODE 010

Certified Material Test Report

Heat Treatment Addendum

Cert # : 116463	Mill Order : 1108050	Heat # : A113151	Issued : 8/20/2011
Work Order : 115418	Sales Order : 95808	Customer : Turret Steel Industries	PO # : 33033 / 1
Load # :	Reference # :	Reference Desc :	End Use :
Size : 3-3/4"	Shape : Round	Grade : 4140	Length : 32'00"

Normalize		Austenitize		Quench Media			Temper		Stress Relieve	
Time	Temp	Time	Temp	Type	Time	Temp	Time	Temp	Time	Temp
hrs	F	2.5 hrs	1650 F	Water	15 min	95-99 F	6.3 hrs	1025 F	5.0 hrs	900 F

* Furnaces are calibrated to API 6A Annex P, and use atmospheric thermocouples
 ** QTC is 12" prolongation from longitudinal orientation machined to a 0.505" buttonhead for tensile.

Hardness (ASTM A370)

Quenche #	Batch #	Location	HB	Rb	Rc
1138941	H207	Mid-Rad O1			36
1138943	H207	Mid-Rad O1			36
1138939	H208	Mid-Rad O1			38
1138933	H211	Mid-Rad O1			36
1138934	H211	Mid-Rad O1			36
1138932	H214	Mid-Rad O1			36
1138931	H214	Mid-Rad O1			36
1138944	H215	Mid-Rad O1			36
1138936	H215	Mid-Rad O1			36
1138942	H217	Mid-Rad O1			38
1138949	H217	Mid-Rad O1			36
1138940	H222	Mid-Rad O1			36

Tensile (ASTM A370)

Quenche #	Batch #	Orientation	Location	Tensile	0.2% Yield	%E (2")	%ROA
1138941	H207	Longitudinal	Mid-Rad O1	147,600 psi	124,200 psi	16	54
1138943	H207	Longitudinal	Mid-Rad O1	147,600 psi	124,200 psi	16	54
1138939	H208	Longitudinal	Mid-Rad O1	151,700 psi	129,700 psi	16	54
1138933	H211	Longitudinal	Mid-Rad O1	147,100 psi	123,200 psi	16	54
1138934	H211	Longitudinal	Mid-Rad O1	147,100 psi	123,200 psi	16	54
1138932	H214	Longitudinal	Mid-Rad O1	151,600 psi	128,900 psi	16	53
1138931	H214	Longitudinal	Mid-Rad O1	151,600 psi	128,900 psi	16	53
1138944	H215	Longitudinal	Mid-Rad O1	156,500 psi	135,300 psi	16	53
1138936	H215	Longitudinal	Mid-Rad O1	156,500 psi	135,300 psi	16	53
1138942	H217	Longitudinal	Mid-Rad O1	152,000 psi	136,000 psi	15	52
1138949	H217	Longitudinal	Mid-Rad O1	152,000 psi	130,000 psi	15	52
1138940	H222	Longitudinal	Mid-Rad O1	140,200 psi	125,300 psi	16	56

Garrett Bouyell
 8/21/11

I hereby certify that the content of this report is correct and accurate, and that all tests and operations performed on this material were in compliance with applicable material specifications and purchaser designated requirements.

Garrett Bouyell
 Garrett Bouyell - Bar Finishing Metallurgist

Any alteration to this report voids Steel Dynamic's warranting of results.

CODE OVP

Certified Material Test Report

Cert #: 116483	Mill Order: 1109059	Heat #: A113151	Issued: 8/30/2011 09:38:57
Work Order: 115418	Sales Order: 95896-1	Customer: Turret Steel Industries	PO #: 33033-1
Load #: 141557	Reference #:	Reference Desc:	End Use:
Size: 3-3/4"	Shape: Round	Grade: 4140	Length: 32'00"
Grain Practice: AI Fine Grain (5-8) per ASTM A29		Reduction Ratio: 12.9 to 1	Disposition: 1

Ladle Chemistry Analysis (ASTM A29)

C	Mn	P	S	Si	Al	Cu	Ni	Cr	Mo	Sn	N	V	Cb	B	Ca	W	Ti	DI
0.40	0.96	0.009	0.005	0.25	0.024	0.20	0.07	0.98	0.22	0.011	0.0081	0.004	0.002	0.0001	0.0009	0.000	0.001	6.09
Pb	Co	As	Sb	Zr	Bi	H	O	Coq	J-Factor									
0.001	0.008	0.005	0.003	0.001	0.000	1.4		0.02										

Product Check Analysis (ASTM A29)

	C	Mn	P	S	Si	Al	Cu	Ni	Cr	Mo	Sn	H	V	Cb	Ti	B	Ca	O
Front																		
Back																		

Jominy (ASTM A255)

	J1	J2	J3	J4	J5	J6	J7	J8	J9	J10	J12	J14	J16	J18	J20	J24	J28	J32
Calc'd	56	56	56	56	56	56	56	56	56	54	50	51	48	48	47	46	45	41
Front																		
Back																		

Microcleanliness (ASTM E45)

Method A								Method C		Method E	
AT	AH	BT	BH	CT	CH	DT	DH	S	O	SAM "B"	SAM "D"

Microcleanliness (DIN 50602)

K				M	
S	O	Tot	Tot		

Decarb

Depth	% of Diameter

Grain Size

Austenitic	Ferritic
7	

Macrostructure (ASTM E361)

S	R	C

Magnetic Particle Inspection

Frequency	Severity

Mechanical Properties (ASTM A370)

Tensile Properties					Hardness	
Tensile Strength	0.2% Yield Strength	% Elong (2")	% ROA	0.35% EUL Yield Strength	(MR)	(Surf)

Steel Dynamics - Engineered Bar Products has a quality system in place which has been certified ISO 9001:2008 compliant, including PED certification.

Comments/Specs

ASTM A322-07 ----- Quench & Temper, Straighten, Stress Relieve ----- Contact Ultrasonic Inspected to 1/8" FBH ----- ASTM A354 Grade BD

DATE 8/30/11
PAGES

Batch # H222

Condition: Quench, Temper, Temper, Straighten, Stress Relieve, Contact UT

UT: Passed Ultrasonic Inspection

I hereby certify that the content of this report is correct and accurate, and that all tests and operations performed on this material were in compliance with applicable material specifications and purchaser designated requirements.

Dylan Kato - Rolling Mill Metallurgist

Any alteration to this report voids Steel Dynamic's warranting of results. No weld repair has been performed on this material. This material is not radioactive and has not been exposed to radioactivity while under the control of Steel Dynamics. This material has not been exposed to mercury while under the control of Steel Dynamics. Unless otherwise noted, this material was melted, continuously cast, and rolled in the USA; w/ all testing performed by Steel Dynamics.

CODE 04P

Certified Material Test Report

Heat Treatment Addendum

Cert #: 116463	MHI Order #: 1108059	Heat #: A113151	Issued: 8/29/2011
Work Order #: 115418	Sales Order #: 95886	Customer: Turret Steel Industries	PO #: 33033 / 1
Load #:	Reference #:	Reference Desc:	End Use:
Size: 3-3/4"	Shape: Round	Grade: 4140	Length: 32'00"

Normalize		Austenitize		Quench Media			Temper		Stress Relieve	
Time	Temp	Time	Temp	Type	Time	Temp	Time	Temp	Time	Temp
hrs	°F	2.5 hrs	1650 °F	Water	15 min	95-99 °F	6.3 hrs	1025 °F	5.0 hrs	900 °F

* Furnaces are calibrated to API 6A Annex P, and use atmospheric thermocouples
 ** QTC is 12" prolongation from longitudinal orientation machined to a 0.505" buttonhead for tensile.

Hardness (ASTM A370)

Bundle #	Batch #	Location	HB	Rb	Rc
1138941	H207	Mid-Rad O1			36
1138943	H207	Mid-Rad O1			36
1138939	H200	Mid-Rad O1			36
1138933	H211	Mid-Rad O1			36
1138934	H211	Mid-Rad O1			36
1138932	H214	Mid-Rad O1			36
1138931	H214	Mid-Rad O1			36
1138944	H215	Mid-Rad O1			36
1138936	H215	Mid-Rad O1			36
1138942	H217	Mid-Rad O1			36
1138948	H217	Mid-Rad O1			36
1138948	H222	Mid-Rad O1			36

Tensile (ASTM A370)

Bundle #	Batch #	Orientation	Location	Tensile	0.2% Yield	%E (2")	%ROA
1138941	H207	Longitudinal	Mid-Rad O1	147,600 psi	124,200 psi	16	54
1138943	H207	Longitudinal	Mid-Rad O1	147,600 psi	124,200 psi	16	54
1138939	H200	Longitudinal	Mid-Rad O1	151,700 psi	120,700 psi	16	54
1138933	H211	Longitudinal	Mid-Rad O1	147,100 psi	123,200 psi	16	54
1138934	H211	Longitudinal	Mid-Rad O1	147,100 psi	123,200 psi	16	54
1138932	H214	Longitudinal	Mid-Rad O1	151,600 psi	128,000 psi	16	53
1138931	H214	Longitudinal	Mid-Rad O1	151,600 psi	120,900 psi	16	53
1138944	H215	Longitudinal	Mid-Rad O1	156,500 psi	135,300 psi	16	53
1138936	H215	Longitudinal	Mid-Rad O1	156,500 psi	135,300 psi	16	53
1138942	H217	Longitudinal	Mid-Rad O1	152,000 psi	130,000 psi	15	52
1138948	H217	Longitudinal	Mid-Rad O1	152,000 psi	130,000 psi	15	52
1138948	H222	Longitudinal	Mid-Rad O1	148,200 psi	125,300 psi	16	56

QUALIFIED
 DATE 8/31/11
 BY: [Signature]

I hereby certify that the content of this report is correct and accurate, and that all tests and operations performed on this material were in compliance with applicable material specifications and purchaser designated requirements.

Garrett Bouyett
 Garrett Bouyett - Bar Finishing Metallurgist

Any alteration to this report voids Steel Dynamic's warranting of results.

DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES

Office of Structural Materials

Quality Assurance and Source Inspection



Bay Area Branch
690 Walnut Ave.St. 150
Vallejo, CA 94592-1133
(707) 649-5453
(707) 649-5493

Contract #: 04-0120F4Cty: SF/ALA Rte: 80 PM: 13.2/13.9File #: 76.15**SOURCE INSPECTION REPORT****Resident Engineer:**Siegenthaler, Peter**Address:** 333 Burma Road**City:** Oakland, CA 94607**Report No:** SIR-003126**Date Inspected:** 23-Mar-2011**Project Name:** SAS Superstructure**Prime Contractor:** American Bridge/Fluor Enterprises, a JV**Contractor:** Dyson Corp. & Subs**OSM Arrival Time:** 800**OSM Departure Time:** 1630**Location:** Painesville, OH**Quality Control Contact:****Material transfer:** Yes No N/A**Stock Transfer:** Yes No N/A**Rebar Test Witness:** Yes No N/A**Other:****Bridge No:** 34-0006**Bid Item:** 68**Quality Control Present:** Yes No**Sampled Items:** Yes No N/A**OK to Cut:** Yes No N/A**Delayed/Cancelled:** Yes No N/A**Component:** High Strength Fasteners**Lot No:****Summary of Items Observed:**

On this date, Quality Assurance Inspector Fred Edmondson traveled to Painesville, OH, as requested, to monitor the fabrication of various high strength rods, bolts and washers for the San Francisco Oakland Bay Bridge (SFOBB) project at Dyson Corporation in Painesville, OH.

Summary of Conversations:

None

Comments

This report is for the purpose of determining conformance with the contract documents and is not for the purpose of making repair or fit for purpose recommendations. Should you require recommendations concerning repairs or remedial efforts please contact Nina Choy 510-385-5910, who represents the Office of Structural Materials for your project.

Inspected By: Edmondson, Fred

Quality Assurance Inspector

Reviewed By: Levell, Bill

QA Reviewer

DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES

Office of Structural Materials

Quality Assurance and Source Inspection



Bay Area Branch
690 Walnut Ave. St. 150
Vallejo, CA 94592-1133
(707) 649-5453
(707) 649-5493

Contract #: 04-0120F4Cty: SF/ALA Rte: 80 PM: 13.2/13.9File #: 76.15**SOURCE INSPECTION REPORT****Resident Engineer:** Siegenthaler, Peter**Address:** 333 Burma Road**City:** Oakland, CA 94607**Report No:** SIR-003190**Date Inspected:** 18-Apr-2011**Project Name:** SAS Superstructure**Prime Contractor:** American Bridge/Fluor Enterprises, a JV**Contractor:** Dyson Corp. & Subs**OSM Arrival Time:** 800**OSM Departure Time:** 1630**Location:** Painesville, OH**Quality Control Contact:** Mr. Russell Welsh**Quality Control Present:** Yes No**Material transfer:** Yes No N/A**Sampled Items:** Yes No N/A**Stock Transfer:** Yes No N/A**OK to Cut:** Yes No N/A**Rebar Test Witness:** Yes No N/A**Delayed/Cancelled:** Yes No N/A**Other:****Bridge No:** 34-0006**Component:** High Strength fasteners**Bid Item:** 68**Lot No:****Summary of Items Observed:**

On this date, Quality Assurance Inspector Fred Edmondson was present at Dyson Corporation in Painesville, OH, as requested, to monitor the fabrication of various high strength rods, bolts and washers for the San Francisco Oakland Bay Bridge (SFOBB) project.

Prior to this date, this QA inspector learned by telephone conversation (April 15) that Dyson had shipped the following quantities of 3.5 inch spherical washers – 277, Heavy Hex spherical nuts - 277 and Heavy Hex jam nuts – 554 to ABFJV, 375 Burma Road, Oakland, CA 94607. The spherical washers require painting Special Provisions 10-1.70. (See summary of conversations below)

This (QA) Inspector met with Dyson Corporation Quality Control (QC) Manager Mr. Russell Welsh and accompanied QC Manager Welsh to the location of stored ASTM 354-07, Grade BD, 3.52 "dia. rods (83). This QA inspector conducted a random visual inspection and review of the Material Test Reports (MTR's). The stored rods appeared to be in general conformance with the contract documents.

The heat number of the rods is 4M76368 with subdivision code numbers 00F (42 ea.) and 00H (41 ea.). The code numbers are assigned by Dyson (for traceability) due to different heat treatment batches. Therefore, there are two lots stored i.e., Lot No. 4M76368, code 00F and 4M76368, code 00H.

At this date, Dyson has not prepared a schedule for machining and processing the 3.5 Inch PWS Anchor Rods.

SOURCE INSPECTION REPORT

(Continued Page 2 of 3)



Summary of Conversations:

This QA inspector met with QA Manager Welsh and Dyson Corporation Sales Manager Pat Sheffield to discuss why the 3.5 inch spherical nuts, spherical washers and jam nuts were shipped to ABFJV Oakland, CA prior to notification that the samples had successfully passed testing by the Caltrans translab and prior to being released by a Caltrans inspector.

QC Manager Welsh commented that an inspector from KTA-Tator was present at the Dyson facility (April 14th) to inspect the, subject, high strength fasteners, The KTA Inspector placed his Stamp (KTA 218) on applicable

SOURCE INSPECTION REPORT

(Continued Page 3 of 3)

MTR's, COC's and apparently indicated the fasteners met the contract document requirements. QA Manager Welsh commented that he believed this to mean that Dyson could ship the fasteners. The fasteners were shipped on April 15th.

Sales Mgr. Sheffield commented that the KTA inspector was present at the Dyson facility (per ABF request) to verify that the O.D. surface of the 3.5 inch spherical washers had been machined per contract requirements and told QA Manager Welsh to turn the truck around and get the high strength fasteners back to Dyson. QA Manager Welsh proceeded to put a tracer on the shipment to get the shipment returned to Dyson.

Comments

This report is for the purpose of determining conformance with the contract documents and is not for the purpose of making repair or fit for purpose recommendations. Should you require recommendations concerning repairs or remedial efforts please contact Nina Choy 510-385-5910, who represents the Office of Structural Materials for your project.

Inspected By:	Edmondson,Fred	Quality Assurance Inspector
Reviewed By:	Levell,Bill	QA Reviewer

DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES

Office of Structural Materials

Quality Assurance and Source Inspection



Bay Area Branch
690 Walnut Ave. St. 150
Vallejo, CA 94592-1133
(707) 649-5453
(707) 649-5493

Contract #: 04-0120F4Cty: SF/ALA Rte: 80 PM: 13.2/13.9File #: 76.15**SOURCE INSPECTION REPORT****Resident Engineer:** Siegenthaler, Peter**Address:** 333 Burma Road**City:** Oakland, CA 94607**Report No:** SIR-003199**Date Inspected:** 20-Apr-2011**Project Name:** SAS Superstructure**Prime Contractor:** American Bridge/Fluor Enterprises, a JV**Contractor:** Dyson Corp. & Subs**OSM Arrival Time:** 800**OSM Departure Time:** 1600**Location:** Painesville, OH

Quality Control Contact: Russell Welsh
Material transfer: Yes No N/A
Stock Transfer: Yes No N/A
Rebar Test Witness: Yes No N/A

Quality Control Present: Yes No
Sampled Items: Yes No N/A
OK to Cut: Yes No N/A
Delayed/Cancelled: Yes No N/A

Other:**Bridge No:** 34-0006**Bid Item:** 68**Component:** High Strength fasteners**Lot No:****Summary of Items Observed:**

On this date, Quality Assurance Inspector Fred Edmondson was present at Dyson Corporation in Painesville, OH, as requested, to monitor the fabrication of various high strength rods, bolts and washers for the San Francisco Oakland Bay Bridge (SFOBB) project.

Previous to this date, this QA inspector learned that Dyson had shipped the quantities of 3.5 inch spherical washers – 277, Heavy Hex spherical nuts - 277 and Heavy Hex jam nuts – 554 to ABFJV, 375 Burma Road, Oakland, CA 94607. The spherical washers require painting (Special Provisions 10-1.70).

QA inspector met with Dyson QC Manager Welsh to discuss the material that was shipped to ABFJV, Oakland, CA. QC Manager Welsh didn't know when the shipment would arrive back at Dyson. His best estimate was sometime next week.

This QA inspector observed that the 90mm PWS Anchor Rods have not been moved since 4-18-11.

Summary of Conversations:

As noted above.

Comments

This report is for the purpose of determining conformance with the contract documents and is not for the purpose of making repair or fit for purpose recommendations. Should you require recommendations concerning repairs or remedial efforts please contact Nina Choy 510-385-5910, who represents the Office of Structural Materials for

SOURCE INSPECTION REPORT

(Continued Page 2 of 2)

your project.

Inspected By: Edmondson, Fred

Quality Assurance Inspector

Reviewed By: Levell, Bill

QA Reviewer

DEPARTMENT OF TRANSPORTATION -Toll Bridge Program

333 Burma Rd.
Oakland, CA 94607
(510) 622-5660, (510) 286-0550 fax



*Flex your power
Be energy efficient!*

April 05, 2011

Contract No. 04-0120F4
04-SF-80-13.2 / 13.9
Self-Anchored Suspension Bridge
Letter No. 05.03.01-009329

Brian A Petersen
Project Executive
American Bridge/Fluor, A JV
375 Burma Road
Oakland, CA 94607

Dear Brian Petersen,

Submittal 1093, Rev. 3 – Final Main Cable Fabrication Length Calculations

The Department has completed the review of Submittal ABF-SUB-001093R03, "Calculations: Final Main Cable Strand Fabrication Length," dated March 30, 2011.

The document title does not reflect the details of the actual submittal. The provided drawings comprise only of the main cable (PWS) anchor rods and the details of the associated hardware. The main cable (PWS) strand lengths were approved for production in State Letter 05.03.01-004273, dated June 03, 2009, and the anchor rod lengths approved in State Letter 05.03.01-008558 dated November 23, 2010.

The submittal is returned "Approved As Noted," however; the approval status only applies to ABF drawing DE409A, which has been stamped accordingly. As informed during Working Drawing Campus (WDC) discussions, the drawings from The Dyson Corporation do not comply with the requirements of Section 5-1.01 "Working Drawings," of the Contract Special Provisions and have not been stamped. Approval of these drawings can only be issued when they are submitted in full compliance with the contract requirements. The drawings were however reviewed and comments are as indicated in the attachment and as outlined below.

CATEGORY A:

1. **Drawing DE409A – Revision. 2:** Apply a thread locking compound to the M16 set screw. Submit details of the proposed compound as notified in State Letter 05.03.01-008587 dated December 01, 2010.

2. The Dyson Corporation Drawings:

Drawing – PWS Anchor Rod:

- Perform Magnetic Particle Testing (MT) in accordance with ASTM A490, per CCO No. 91
- The depth of the Unusable Tap Runout must be the minimum needed for the desired thread length.
- Provide QA Samples in accordance with ABF-RFI-001739R00. The quantity of samples is dependent upon the number of Mill Heats and Heat Treatment Lots. If heat treatment is

performed on a continuous quench and temper line then the heat treatment lot definition is in accordance with the response to ABF-RFI-001631R00.

- Details of the extension rod to be used with the PWS anchor rod coupler (Submittal ABF-SUB-001244R00) were not included in the Bill of Materials Table.

Drawing – Coupling Nut:

- Provide a 2mm radius at the Hex Nut shoulder transition.

If you have any questions, please contact Brian Boal at (510) 622-5191

Sincerely,

<<< ORIGINAL SIGNED >>>

BRIAN BOAL
Construction Manager (Cable)

For: PETER SIEGENTHALER
Resident Engineer

Attachment

file: 05.03.01, 49.037, 49.037S1, 49.091, 49.108, 49.185, 55.1093

**SAN FRANCISCO OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT**

**SELF-ANCHORED SUSPENSION BRIDGE
(Superstructure and Tower)**

Caltrans Contract No. 04-0120F4

Bridge No. 34-0006L/R

District 04 County SF Route 80 Kilometer Post 13.2 / 13.9

**Submittal ABF-SUB-001093R03: Final Main Cable Strand Fabrication
Length Calculations**

Prepared By: American Bridge / Fluor Enterprises Inc., A Joint Venture

Date: March 30, 2011

Revision 3

TABLE OF CONTENTS

DESCRIPTION	PAGES
Final Main Cable Strand Length Calculations Written Outline (Rev. 3).....	1
Main Cable Strand and Anchor Rod Lengths Drawing DE409A (Rev. 2).....	1
Anchor Rod, Spherical Nut, Jam Nut and Coupling Nut Details	6

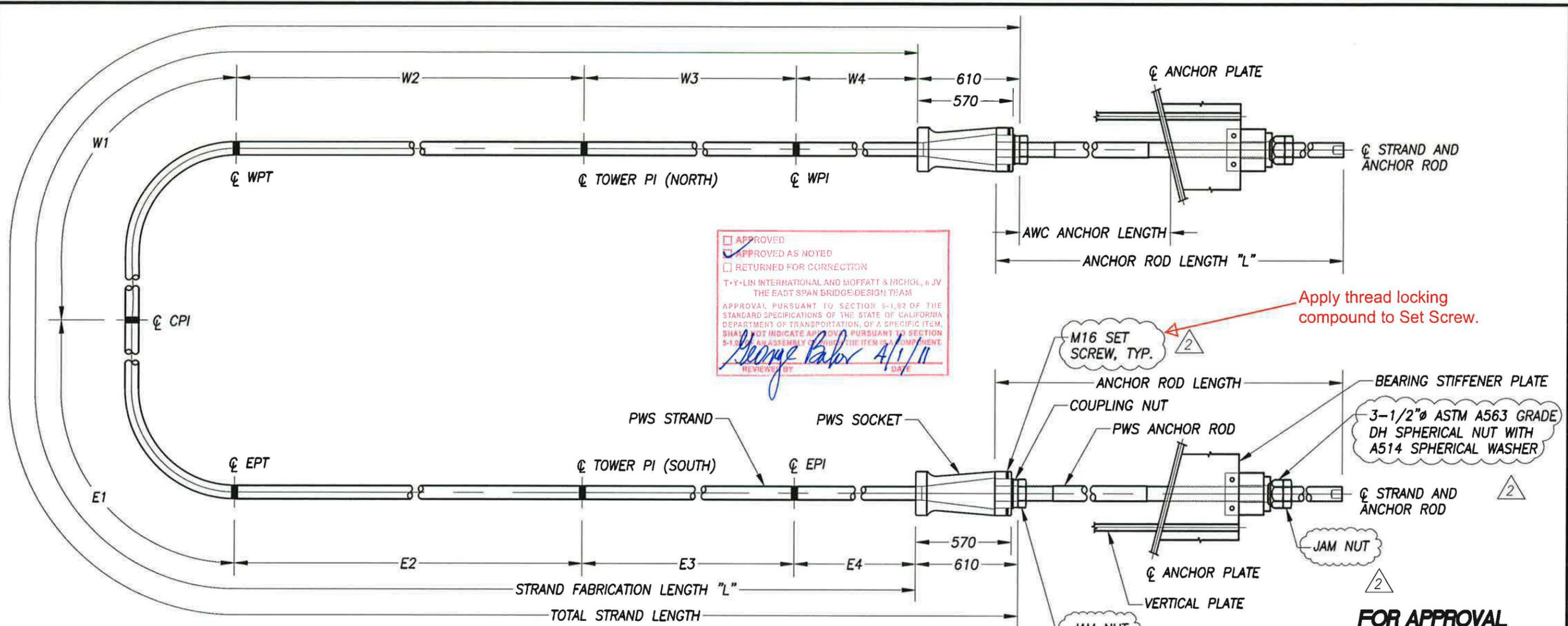


PROJECT: San Francisco Oakland Bay SAS Bridge Superstructure

**SUBJECT: FINAL MAIN CABLE STRAND LENGTH CALCULATIONS
WRITTEN OUTLINE**

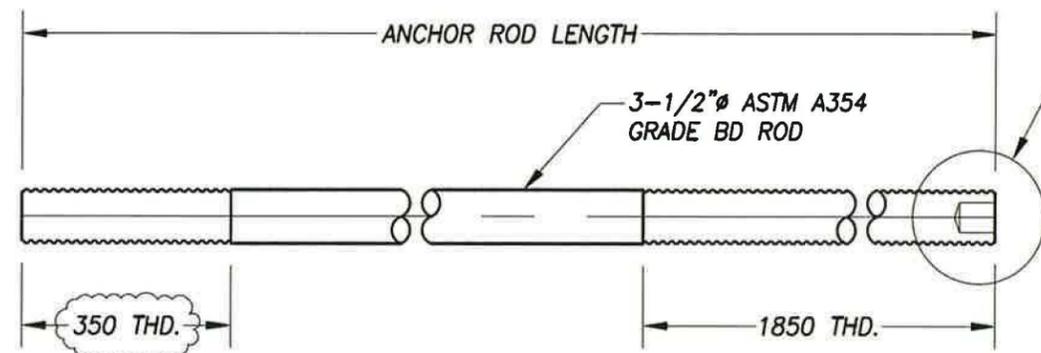
Further to the Department Letter Nos. 05.03.01-008558 and 05.03.01-008587 wherein the Department requested American Bridge / Fluor Enterprises, Inc., A Joint Venture (ABFJV) to provide one jam nut at the Coupling Nut and one jam nut at the Spherical Nut, ABFJV provides herein the revised PWS anchor rod assembly drawing (DE409A, Revision 2) and detail drawings of the Anchor Rods, Spherical Nuts, Jam Nuts and Coupling Nuts.

Mar 30, 2011 - 11:40am Y:\400 Cable Works\Submittals\Submittal 001093R03 - Final Main Cable Strand Length Calculations (March 30, 2011)\Drawings\DWG_DE409-R02.dwg

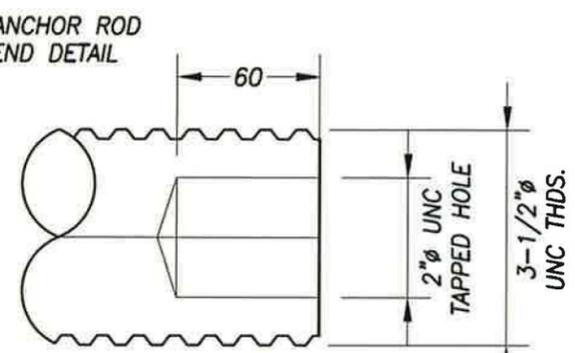


APPROVED
 APPROVED AS NOYED
 RETURNED FOR CORRECTION
 T-Y-LIN INTERNATIONAL AND MOFFATT & NICHOL, a JV
 THE EAST SPAN BRIDGE DESIGN TEAM
 APPROVAL PURSUANT TO SECTION 5-1.02 OF THE
 STANDARD SPECIFICATIONS OF THE STATE OF CALIFORNIA
 DEPARTMENT OF TRANSPORTATION, OF A SPECIFIC ITEM,
 SHALL NOT INDICATE APPROVAL PURSUANT TO SECTION
 5-1.02 OF AN ASSEMBLY OF WHICH THE ITEM IS A COMPONENT.
George Baker 4/1/11
 REVIEWED BY DATE

CABLE STRAND AND ANCHOR ROD PLAN



ANCHOR ROD DETAIL



ANCHOR ROD END DETAIL

FOR APPROVAL

STATE OF CALIFORNIA
 DEPARTMENT OF TRANSPORTATION
 CONTRACT NO. 04-0120F4
 BRIDGE NO. 34-0008L/R
 DISTRICT COUNTY ROUTE KILOMETER POST
 04 SF 80 13.2 / 13.9

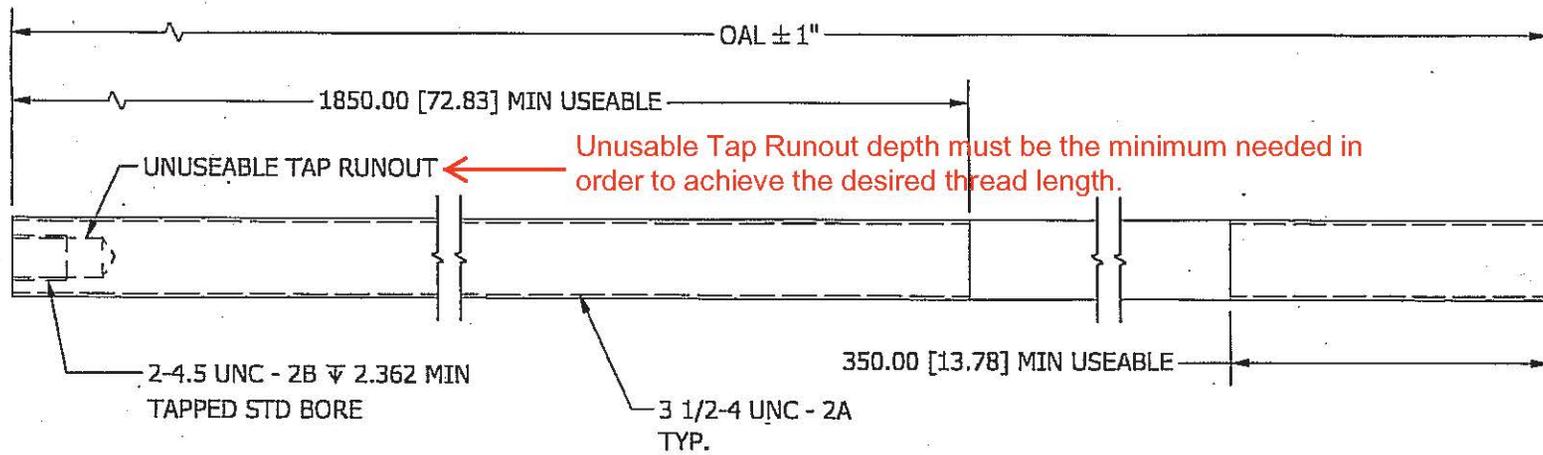
SAN FRANCISCO OAKLAND BAY BRIDGE
 EAST SPAN SEISMIC SAFETY PROJECT
 SELF ANCHORED SUSPENSION BRIDGE
 (SUPERSTRUCTURE AND TOWER)



MAIN CABLE STRAND AND ANCHOR ROD LENGTHS

REV	DATE	DWG BY	DWG CHK	DSGN BY	DSGN CHK	DESCRIPTION
6						
5						
4						
3						
2	3/30/11	KMS	AS	KMS	AS	Added Jam Nuts, Set Screws and Spherical Nuts
1	5/22/09	AS	KMS	AS	KMS	Change in Anchor Rod Thread Length

Design By: K. SMITH Date: 12/26/08
 Design Chk: K. BALTZER Date: 3/30/09
 Drawn By: K. SMITH Date: 12/26/08
 Drawing Chk: K. BALTZER Date: 3/30/09
 In Charge Of: K. BALTZER
 Job No. 680110 Sheet No. DE409A
 Scale: NONE Revision: 2



Item #	Dyson SO#	Qty.	OAL (mm)	OAL (in)
1A	211855	31	8500	334.646
2A	211856	17	8600	338.583
3A	211857	32	8700	342.520
4A	211858	30	8800	346.457
5A	211859	48	8900	350.394
6A	211860	26	9000	354.331
7A	211861	16	9100	358.268
8A	211862	20	9200	362.205
9A	211863	25	9300	366.142
10A	211864	7	9400	370.079
11A	211865	9	9500	374.016
12A	211866	9	9600	377.953
13A	211867	4	9700	381.890

Notes:

Perform Magnetic Particle Testing (MT) in accordance with ASTM A490 on the PWS Rods.

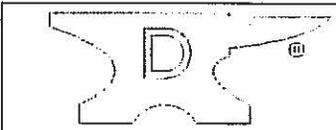
Provide QA Samples in accordance with ABF-RFI-001739R00.

NOTES:

ANCHOR RODS SHALL BE PREPARED AND GALVANIZED IN ACCORDANCE WITH SPECIAL PROVISIONS SECTION 10-1.59 FOR ASTM A354 GR BD FASTENERS.

ENGINEERING
MAR 28 2011
DYSON CORP.

NAME	DATE
SIGNATURE APPROVAL	



THE DYSON CORPORATION
53 FREEDOM RD. PAINESVILLE, OH 44077
440.946.3500 FAX 440.352.2700

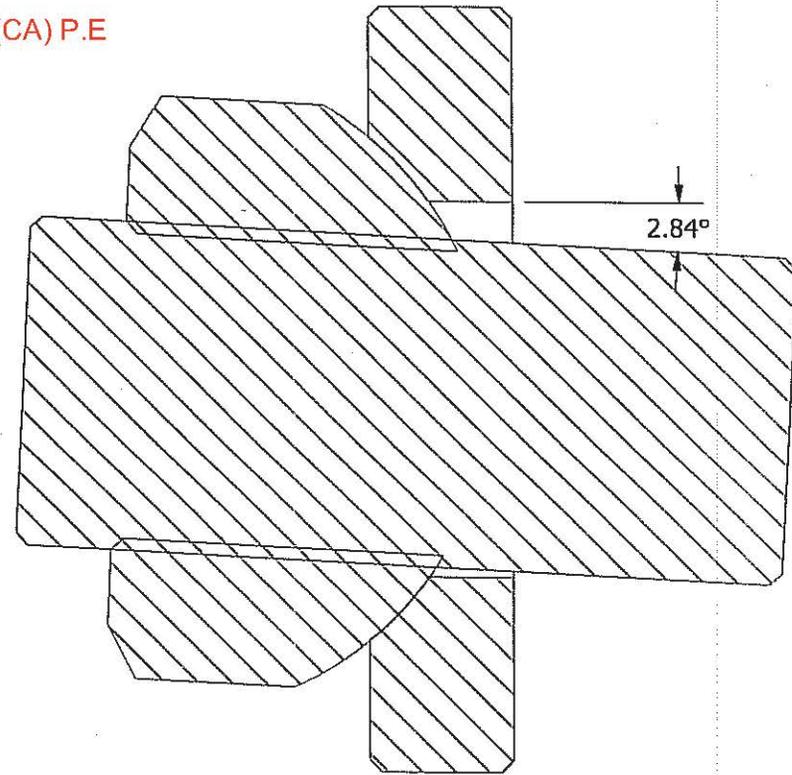
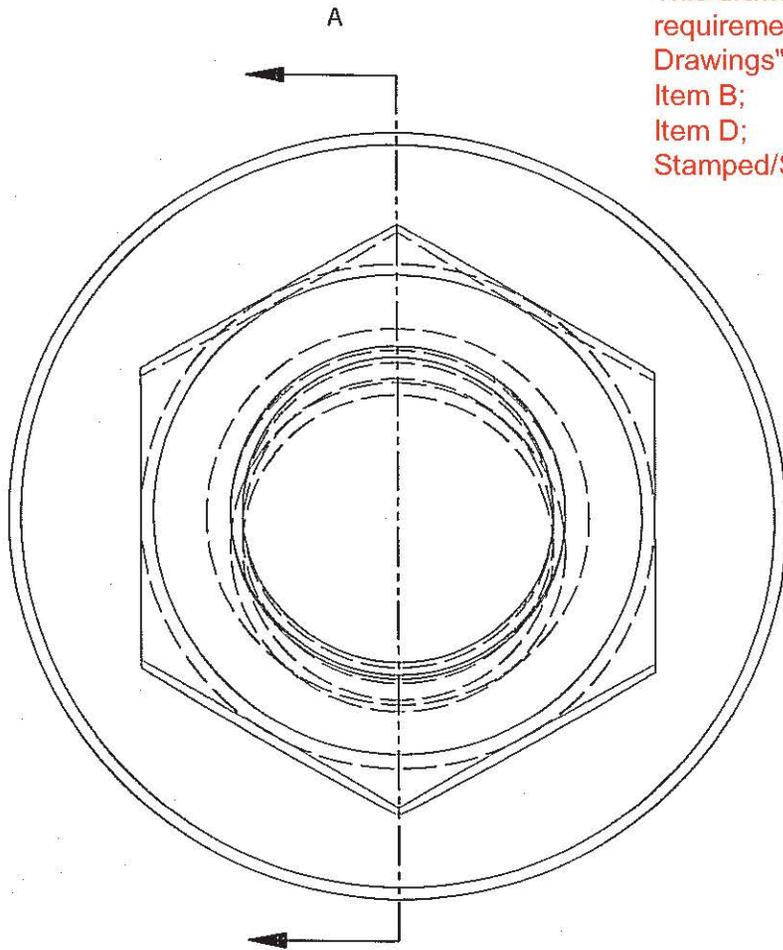
This drawing does not comply with the following requirements of Section 5-1.01 "Working Drawings" of the Contract
Special Provisions:
Item B;
Item D;
Stamped/Signed by (CA) P.E

TOLERANCES UNLESS OTHERWISE SPECIFIED .00, FRACTIONS ± 1/16 .000 ± N/A ANGLES ± 5 FINISH ± 500 CONCENTRICITY ± N/A	ASSIGNED BY	PS	2/16/2011	CUST: AMERICAN BRIDGE	
	DRAWN BY	plinehan	2/16/2011	PROJECT: OAKLAND BAY BRIDGE	
	APPROVED BY			MATL: ASTM A354 BD HDG	
					PWS ANCHOR ROD (JOB 660110)
				SHEET DE409A	# 09
				DWG. NAME: PWS Anchor Rod.ipt	

C:\PROJECTS\CUSTOMERS\American Bridge\Oakland Bay\Coupling Nut\PWS Anchor Rod.ipt

C:\PROJECTS\CUSTOMERS\American Bridge\Oakland Bay\3.50 HHW Spherical Fasteners\3.50 Round Spherical Assy.iam

This drawing does not comply with the following requirements of Section 5-1.01 "Working Drawings" of the Contract Special Provisions:
 Item B;
 Item D;
 Stamped/Signed by (CA) P.E



SECTION A-A

ENGINEERING

AUG 23 2010

DYSON CORP.

DRAFT

Note:
 This DRAFT detail was initially provided in
 ABF-RFI-001644R04

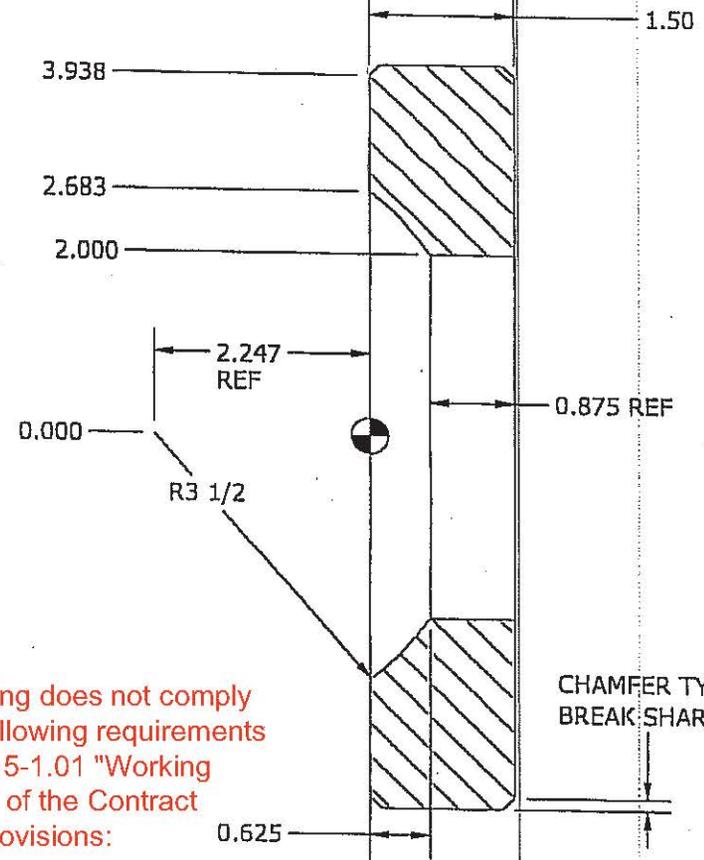
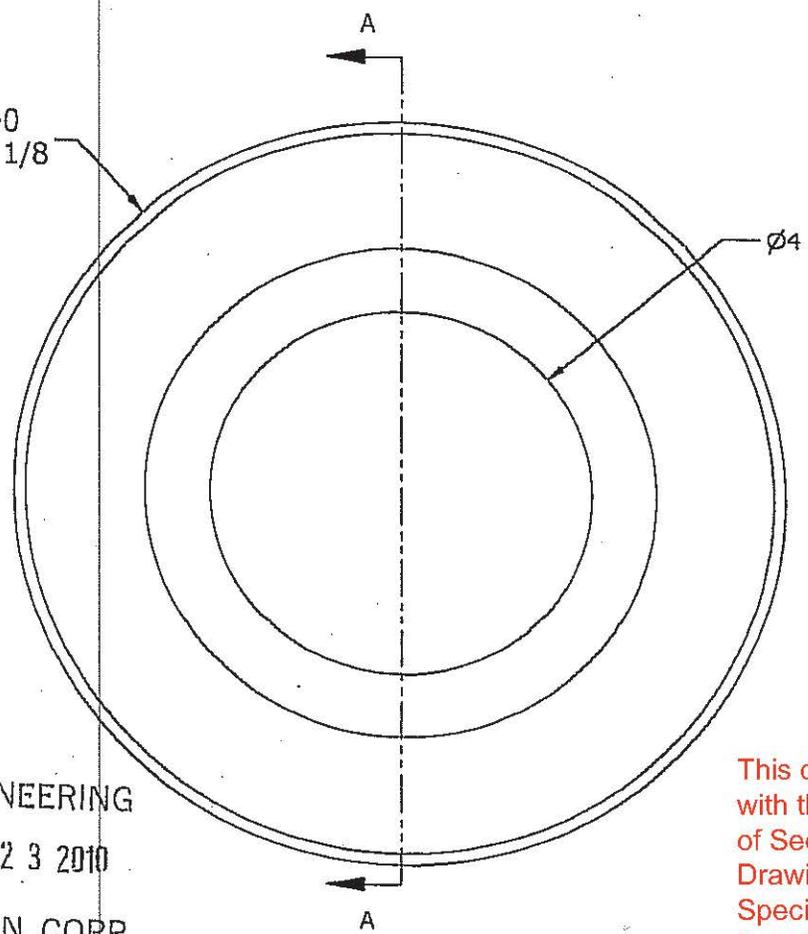
NAME	DATE
SIGNATURE APPROVAL	

TOLERANCES UNLESS OTHERWISE SPECIFIED
.00, FRACTIONS ± N/A
.000 ± N/A
ANGLES ± N/A
FINISH ± N/A
CONCENTRICITY ± N/A

THE DYSON CORPORATION		
53 FREEDOM RD. PAINESVILLE, OH 44077		
440.946.3500 FAX 440.352.2700		
ASSIGNED BY		CUST: AMERICAN BRIDGE
KW	11/17/2009	PROJECT: 3.50" SPHERICAL ASSY
DRAWN BY		MATL: N/A
Pat	11/17/2009	
APPROVED BY		
		DWG. NAME: 3.50 Round Spherical Assy.iam

C:\PROJECTS\CUSTOMER\American Bridge\Oakland Bay\3.50 HHN Spherical Fasteners\3.50 Spherical Round Plate.ipt

$\varnothing 8 \frac{1}{8} \begin{matrix} +0 \\ -1/8 \end{matrix}$



ENGINEERING
AUG 23 2010
DYSON CORP.

DRAFT

NAME	DATE
SIGNATURE APPROVAL	

This drawing does not comply with the following requirements of Section 5-1.01 "Working Drawings" of the Contract Special Provisions:
Item B;
Item D;
Stamped/Signed by (CA) P.E

SECTION A-A
SCALE 1 / 2

NOTE: HAND GRIND TO FEATHER OUT TORCH MARKS

Note:
This DRAFT detail was initially provided in ABF-RFI-001644R04

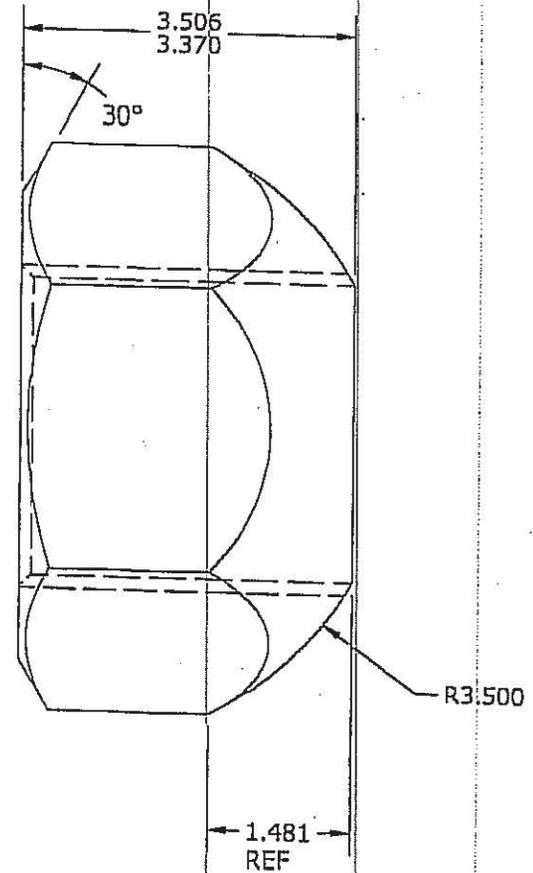
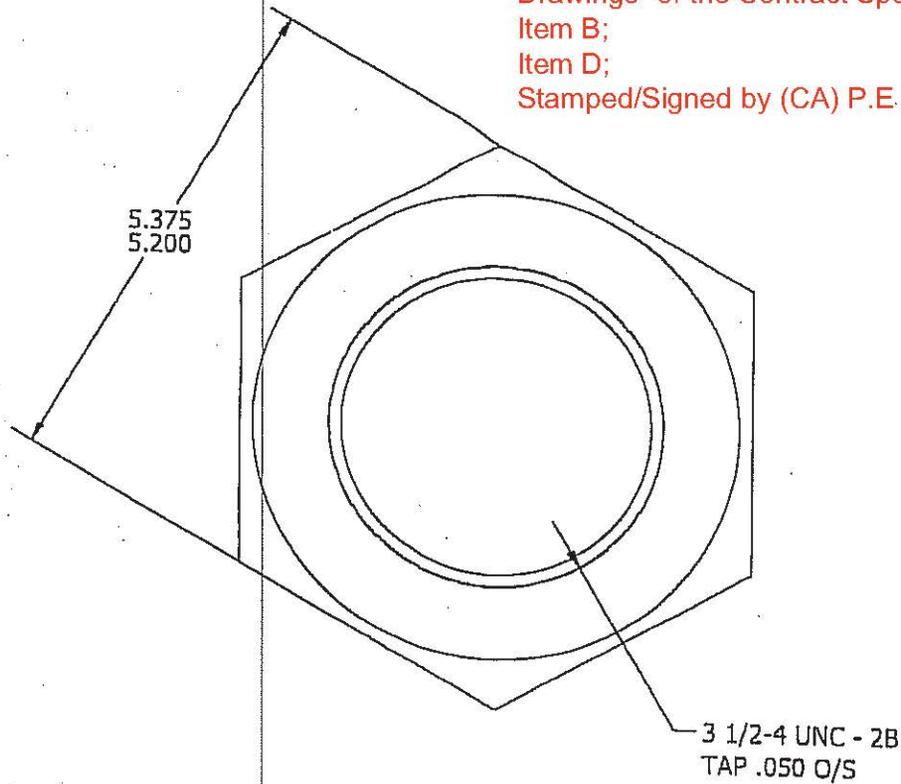
TOLERANCES UNLESS OTHERWISE SPECIFIED	
.00, FRACTIONS	$\pm 1/16$
.000	$\pm 1/64$
ANGLES	N/A
FINISH	N/A
CONCENTRICITY	\pm

ASSIGNED BY	KW	11/17/2009
DRAWN BY	Pat	11/17/2009
APPROVED BY		

THE DYSON CORPORATION
53 FREEDOM RD. PAINESVILLE, OH 44077
440.946.3500 FAX 440.352.2700

CUST: AMERICAN BRIDGE
PROJECT: 3.50 SPHERICAL PLATE WASHER
MATL: ASTM A514 PAINT PER RFI 1233
DWG. NAME: 3.50 Spherical Round Plate.ipt

This drawing does not comply with the following requirements of Section 5-1.01 "Working Drawings" of the Contract Special Provisions:
 Item B;
 Item D;
 Stamped/Signed by (CA) P.E.



ENGINEERING

AUG 23 2010

DYSON CORP.

DRAFT

NAME	DATE
SIGNATURE APPROVAL	

TOLERANCES UNLESS OTHERWISE SPECIFIED	
.00, FRACTIONS ±	N/A
.000 ±	N/A
ANGLES ±	N/A
FINISH ±	250
CONCENTRICITY ±	N/A

ASSIGNED BY	
KW	11/17/2009
DRAWN BY	
Pat	11/17/2009
APPROVED BY	

THE DYSON CORPORATION
 53 FREEDOM RD. PAINESVILLE, OH 44077
 440.946.3500 FAX 440.352.2700

CUST: AMERICAN BRIDGE	REV	SO
PROJECT: 3.50"-4 UNC-2B +.050 O/S		
MATL: ASTM A563 GR DH (HDG)		
DWG. NAME: 3.50 Spherical Nut.ipt		

Note:
 This DRAFT detail was initially provided in
 ABF-RFI-001644R04

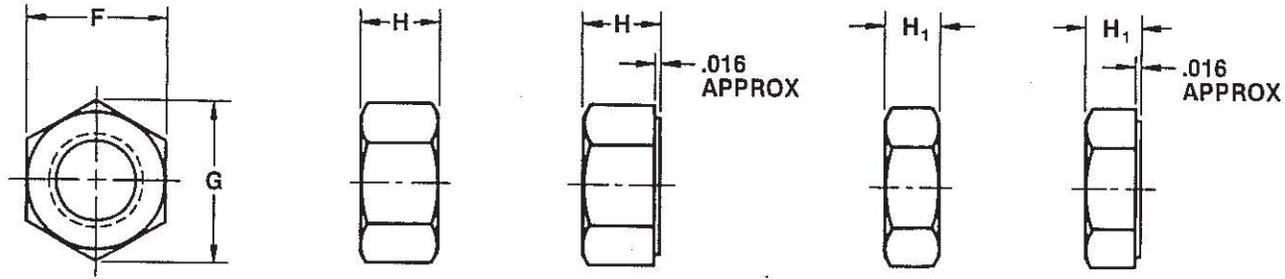


Table 9 Dimensions of Heavy Hex Nuts and Heavy Hex Jam Nuts

Nominal Size or Basic Major Dia of Thread	F			G		H			H ₁			Runout of Bearing Face, FIM		
	Width Across Flats			Width Across Corners		Thickness Heavy Hex Nuts			Thickness Heavy Hex Jam Nuts			Heavy Hex Nuts Specified Proof Load		Heavy Hex Jam Nuts
	Basic	Max	Min	Max	Min	Basic	Max	Min	Basic	Max	Min	Up to 150,000 psi	150,000 psi and Greater	All Strength Levels
														Max
1/2 0.3500	1/2	0.500	0.488	0.577	0.556	15/64	0.950	0.910	11/64	0.180	0.156	0.017	0.014	0.017
5/16 0.3125	9/16	0.562	0.546	0.650	0.622	19/64	0.314	0.280	13/64	0.220	0.186	0.020	0.012	0.020
3/8 0.3750	11/16	0.688	0.669	0.794	0.763	23/64	0.377	0.341	15/64	0.252	0.216	0.021	0.014	0.021
7/16 0.4375	3/4	0.750	0.728	0.866	0.830	27/64	0.441	0.403	17/64	0.285	0.247	0.022	0.015	0.022
1/2 0.5000	7/8	0.875	0.850	1.010	0.969	31/64	0.504	0.464	19/64	0.317	0.277	0.023	0.016	0.023
9/16 0.5625	15/16	0.938	0.909	1.083	1.037	35/64	0.568	0.526	21/64	0.343	0.307	0.024	0.017	0.024
5/8 0.6250	1 1/16	1.062	1.031	1.227	1.175	39/64	0.631	0.587	23/64	0.381	0.337	0.025	0.018	0.025
3/4 0.7500	1 1/4	1.250	1.212	1.440	1.382	47/64	0.758	0.710	27/64	0.446	0.398	0.027	0.020	0.027
7/8 0.8750	1 7/16	1.438	1.394	1.660	1.589	55/64	0.885	0.833	31/64	0.510	0.458	0.029	0.022	0.029
1 1.0000	1 5/8	1.625	1.575	1.876	1.796	69/64	1.072	0.956	35/64	0.575	0.519	0.031	0.024	0.031
1 1/8 1.1250	1 13/16	1.812	1.756	2.093	2.002	1 7/16	1.139	1.079	39/64	0.639	0.579	0.033	0.027	0.033
1 1/4 1.2500	2	2.000	1.938	2.309	2.209	1 7/32	1.251	1.187	23/32	0.751	0.687	0.035	0.030	0.035
1 3/8 1.3750	2 3/16	2.188	2.119	2.526	2.416	1 11/32	1.378	1.310	25/32	0.815	0.747	0.038	0.033	0.038
1 1/2 1.5000	2 3/8	2.375	2.300	2.742	2.622	1 15/32	1.505	1.433	27/32	0.880	0.808	0.041	0.036	0.041
1 5/8 1.6250	2 9/16	2.562	2.481	2.959	2.828	1 19/32	1.632	1.556	29/32	0.944	0.868	0.044	0.038	0.044
1 3/4 1.7500	2 3/4	2.750	2.662	3.175	3.035	1 23/32	1.759	1.679	31/32	1.005	0.929	0.048	0.041	0.048
1 7/8 1.8750	2 15/16	2.875	2.844	3.392	3.242	1 27/32	1.886	1.802	1 1/32	1.073	0.989	0.051	0.044	0.051
2 2.0000	3 1/8	3.125	3.025	3.608	3.449	1 31/32	2.013	1.925	1 3/32	1.138	1.050	0.055	0.047	0.055
2 1/4 2.2500	3 1/2	3.500	3.388	4.041	3.862	2 13/64	2.251	2.155	1 13/64	1.251	1.155	0.061	0.052	0.061
2 1/2 2.5000	3 7/8	3.875	3.750	4.474	4.275	2 29/64	2.505	2.401	1 29/64	1.505	1.401	0.068	0.058	0.068
2 3/4 2.7500	4 1/4	4.250	4.112	4.887	4.686	2 43/64	2.753	2.647	1 37/64	1.634	1.522	0.074	0.064	0.074
3 3.0000	4 5/8	4.625	4.475	5.340	5.102	2 31/64	3.013	2.893	1 45/64	1.763	1.643	0.081	0.070	0.081
3 1/4 3.2500	5	5.000	4.858	5.774	5.513	3 3/16	3.252	3.124	1 13/16	1.870	1.748	0.087	0.075	0.087
3 1/2 3.5000	5 3/8	5.375	5.200	6.207	5.928	3 7/16	3.502	3.374	1 15/16	2.006	1.870	0.094	0.081	0.094
3 3/4 3.7500	5 1/2	5.625	5.462	6.540	6.241	3 11/16	3.752	3.616	2 1/16	2.184	2.038	0.100	0.087	0.100
4 4.0000	6 1/8	6.125	5.923	7.073	6.733	3 13/16	4.014	3.862	2 3/16	2.264	2.112	0.107	0.096	0.107
See Notes	9	3		4								2		

HEAVY HEX NUTS AND HEAVY HEX JAM NUTS

C:\PROJECTS\CUSTOMERS\American Bridge\Oakland Bay\Coupling Nut.ipt

6.062 [154.0 mm]
5.791 [147.1 mm]

6.496 [165.0 mm]

OAL 5.512 [140.0 mm] REF

1.181 [30.0 mm]

4.331 [110.0 mm]

5.250 [133.4 mm]
5.079 [129.0 mm]

3 1/2-4 UNC - 2B + .050
AFTER HOT DIP
GALVANIZING

Radius 2mm
~~TOOL RADIUS~~
~~IF NEEDED~~

7-4 UNC - 2A

.984 [25.0 mm]

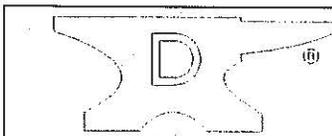
.787 [20.0 mm]



This drawing does not comply with the following requirements of Section 5-1.01 "Working Drawings" of the Contract Special Provisions:
Item B;
Item D;
Stamped/Signed by (CA) P.E

Note:
This detail was initially provided in ABF-RFI-000721R01

TOLERANCES
UNLESS OTHERWISE SPECIFIED
.00, FRACTIONS ± 1/16
.000 ± 1/32
ANGLES ± 5
FINISH ± 125
CONCENTRICITY ± N/A



THE DYSON CORPORATION

53 FREEDOM RD. PAINESVILLE, OH 44077
440.946.3500 FAX 440.352.2700

ASSIGNED BY	Pat	1/12/2009	CUST: American Bridge
DRAWN BY	Sean	1/12/2009	PROJECT: Oakland Bay Bridge
APPROVED BY			MATL: ASTM A194 Grade 7
			Galvanized ASTM A153
			DWG. NAME: Coupling Nut.ipt

REV

DEPARTMENT OF TRANSPORTATION -Toll Bridge Program

333 Burma Rd.
Oakland, CA 94607
(510) 622-5660, (510) 286-0550 fax



*Flex your power
Be energy efficient!*

November 23, 2010

Contract No. 04-0120F4
04-SF-80-13.2 / 13.9
Self-Anchored Suspension Bridge
Letter No. 05.03.01-008558

Brian A. Petersen
Project Executive
American Bridge/Fluor, A JV
375 Burma Road
Oakland, CA 94607

Dear Brian Petersen,

Submittal 1093, Rev. 2 - Final Main Cable Fabrication Length Calculations

The Department has completed the review of Submittal ABF-SUB-001093R02, "Calculations: Final Main Cable Strand Fabrication Length," dated October 11, 2010. This submittal only provides the lengths of the main cable (PWS) anchor rods, the main cable (PWS) strand lengths having been approved for production in State Letter 05.03.01-004273, dated June 03, 2009.

The Submittal is "Approved." Please procure a (one) jam nut for each PWS anchor rod as part of the purchase order/supply agreement. The provided calculated PWS anchor rod lengths are sufficient to accommodate the jam nut, which will be used at the anchor plate location. The costs associated with procuring and installing the jam nut will be compensated under Contract Change Order (CCO) No. 37S1. Please also be aware of the following comment.

CATEGORY B:

1. In accordance with Section 5-1.02 "Plans and Working Drawings," of the Standard Specifications and Section 5-1.01 "Working Drawings," of the Contract Special Provisions, provide shop drawings for the PWS rods, detailing the quantities of rods for each given "Adjusted Rod Length (m)," the threaded length, nut quantities, material grades and coating requirements.
Please be aware that in accordance with Contract Change Order (CCO) No. 37S0, hot dip galvanizing of the ASTM A354 Grade BD PWS anchor rods must conform to the requirements of Section 10-1.59 "Steel Structures," subsection "Fabrication," subsection "Bolted Connections," of the Contract Special Provisions.

If you have any questions, please contact Brian Boal at (510) 622-5191

Sincerely,

<<< ORIGINAL SIGNED >>>

BRIAN BOAL
Construction Manager, (Cable)

For: PETE SIEGENTHALER
Resident Engineer

Attachment

file:05.03.01, 49.037S1, 55.1093

**SAN FRANCISCO OAKLAND BAY BRIDGE
EAST SPAN SEISMIC SAFETY PROJECT**

**SELF-ANCHORED SUSPENSION BRIDGE
(Superstructure and Tower)**

Caltrans Contract No. 04-0120F4
Bridge No. 34-0006L/R
District 04 County SF Route 80 Kilometer Post 13.2 / 13.9

**Submittal ABF-SUB-001093R02: Final Main Cable Strand Fabrication
Length Calculations**

Baseline Schedule Activity ID: CASUB000790

Prepared By: American Bridge / Fluor Enterprises Inc., A Joint Venture
Date: November 10, 2010
Revision 2

TABLE OF CONTENTS

DESCRIPTION	PAGES
Final Main Cable Strand Length Calculations Written Outline (Rev. 2).....	1
Final Anchor Rod Fabrication Lengths (Rev. 2).....	6



<input checked="" type="checkbox"/> APPROVED
<input type="checkbox"/> APPROVED AS NOTED
<input type="checkbox"/> RETURNED FOR CORRECTION
T-Y-LIN INTERNATIONAL AND MOFFATT & NICHOL, a JV THE EAST SPAN BRIDGE DESIGN TEAM
APPROVAL PURSUANT TO SECTION 5-1.02 OF THE STANDARD SPECIFICATIONS OF THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION, OF A SPECIFIC ITEM, SHALL NOT INDICATE APPROVAL PURSUANT TO SECTION 5-1.02 OF AN ASSEMBLY OF WHICH THE ITEM IS A COMPONENT.
 REVIEWED BY _____ DATE 11/22/10

PROJECT: San Francisco Oakland Bay SAS Bridge Superstructure

**SUBJECT: FINAL MAIN CABLE STRAND LENGTH CALCULATIONS
WRITTEN OUTLINE**

In accordance with Special Provisions Section 10-1.60, Cable System, American Bridge / Fluor Enterprises, Inc., A Joint Venture (ABFJV) provides herein revised calculations for the main cable anchor rod lengths. These revised lengths incorporate the approved shop drawing details for the east anchorage bearing stiffener plates as well as changes to the spherical nut and washer assembly. This document specifically addresses Section 6.5 of the Cable System Construction Engineering Documents Submittal Matrix.

This submittal provides the final main cable anchor rod lengths. The main cable lengths previously approved in submittal ABF-SUB-001093R01 remain unchanged. However in accordance with ABF-RFI-000712R02, the positions of strand numbers 4 and 7 have been switched in both the north and south anchorages. The difference in strand length at these locations has been accounted for in the anchor rod lengths included in this submittal by increasing the anchor rod lengths in strand number 4 by 37mm and 30mm and decreasing the anchor rod lengths in strand number 7 by 37mm and 30mm in the north and south anchorages, respectively.

The anchor rod fabrication lengths provided in the table “Final Main Cable Anchor Rod Lengths” of this submittal provide a total strand adjustment range of +/-800mm at each end of each strand. For ease of manufacturing and installation, these anchor rod fabrication lengths have been rounded up to the nearest 0.1 meters.

Final Main Cable Anchor Rod Lengths (North Anchorage)

Strand No.	North Anchorage								
	AWC Anchor Length ¹ (m)	CL Anchor Plate to Bearing Block ² (m)	Coupling Nut Length (m)	Bearing Block (m)	Nut and Washer ⁴ (m)	Adjustment (m)	Tapped End (m)	Required Rod Length (m)	Adjusted Rod Length (m)
1	6.758	0.434	0.140	0.150	0.105	0.800	0.060	8.447	8.500
2	6.997	0.442	0.140	0.150	0.105	0.800	0.060	8.694	8.700
3	7.444	0.545	0.140	0.150	0.105	0.800	0.060	9.244	9.300
4	7.482	0.507	0.140	0.150	0.105	0.800	0.060	9.244	9.300
5	6.836	0.437	0.140	0.150	0.105	0.800	0.060	8.528	8.600
6	7.138	0.479	0.140	0.150	0.105	0.800	0.060	8.872	8.900
7	7.554	0.545	0.140	0.150	0.105	0.800	0.060	9.354	9.400
8	6.884	0.468	0.140	0.150	0.105	0.800	0.060	8.607	8.700
9	6.764	0.435	0.140	0.150	0.105	0.800	0.060	8.454	8.500
10	6.922	0.463	0.140	0.150	0.105	0.800	0.060	8.640	8.700
11	7.249	0.447	0.140	0.150	0.105	0.800	0.060	8.951	9.000
12	7.139	0.478	0.140	0.150	0.105	0.800	0.060	8.872	8.900
13	7.592	0.506	0.140	0.150	0.105	0.800	0.060	9.353	9.400
14	7.078	0.483	0.140	0.150	0.105	0.800	0.060	8.816	8.900
15	6.812	0.438	0.140	0.150	0.105	0.800	0.060	8.505	8.600
16	6.796	0.451	0.140	0.150	0.105	0.800	0.060	8.502	8.600
17	6.835	0.436	0.140	0.150	0.105	0.800	0.060	8.526	8.600
18	6.997	0.440	0.140	0.150	0.105	0.800	0.060	8.692	8.700
19	7.251	0.445	0.140	0.150	0.105	0.800	0.060	8.951	9.000
20	7.443	0.543	0.140	0.150	0.105	0.800	0.060	9.241	9.300
21	7.362	0.500	0.140	0.150	0.105	0.800	0.060	9.117	9.200
22	6.953	0.443	0.140	0.150	0.105	0.800	0.060	8.651	8.700
23	6.782	0.453	0.140	0.150	0.105	0.800	0.060	8.490	8.500
24	6.763	0.434	0.140	0.150	0.105	0.800	0.060	8.452	8.500
25	6.921	0.461	0.140	0.150	0.105	0.800	0.060	8.637	8.700
26	6.996	0.439	0.140	0.150	0.105	0.800	0.060	8.690	8.700
27	7.247	0.444	0.140	0.150	0.105	0.800	0.060	8.946	9.000
28	7.591	0.503	0.140	0.150	0.105	0.800	0.060	9.349	9.400
29	7.502	0.456	0.140	0.150	0.105	0.800	0.060	9.213	9.300
30	7.079	0.479	0.140	0.150	0.105	0.800	0.060	8.813	8.900
31	6.811	0.437	0.140	0.150	0.105	0.800	0.060	8.503	8.600
32	6.760	0.432	0.140	0.150	0.105	0.800	0.060	8.447	8.500
33	6.797	0.445	0.140	0.150	0.105	0.800	0.060	8.497	8.500
34	6.920	0.459	0.140	0.150	0.105	0.800	0.060	8.634	8.700
35	7.135	0.475	0.140	0.150	0.105	0.800	0.060	8.865	8.900
36	7.246	0.442	0.140	0.150	0.105	0.800	0.060	8.943	9.000
37	7.588	0.501	0.140	0.150	0.105	0.800	0.060	9.344	9.400
38	7.187	0.448	0.140	0.150	0.105	0.800	0.060	8.890	8.900
39	6.887	0.463	0.140	0.150	0.105	0.800	0.060	8.605	8.700
40	6.781	0.448	0.140	0.150	0.105	0.800	0.060	8.484	8.500
41	6.763	0.432	0.140	0.150	0.105	0.800	0.060	8.450	8.500
42	6.834	0.434	0.140	0.150	0.105	0.800	0.060	8.523	8.600
43	6.919	0.457	0.140	0.150	0.105	0.800	0.060	8.631	8.700
44	7.134	0.473	0.140	0.150	0.105	0.800	0.060	8.862	8.900
45	7.439	0.541	0.140	0.150	0.105	0.800	0.060	9.235	9.300
46	7.367	0.495	0.140	0.150	0.105	0.800	0.060	9.117	9.200
47	6.956	0.441	0.140	0.150	0.105	0.800	0.060	8.652	8.700
48	6.813	0.435	0.140	0.150	0.105	0.800	0.060	8.503	8.600
49	6.759	0.431	0.140	0.150	0.105	0.800	0.060	8.445	8.500
50	6.795	0.444	0.140	0.150	0.105	0.800	0.060	8.494	8.500

Strand No.	North Anchorage								
	AWC Anchor Length ¹ (m)	CL Anchor Plate to Bearing Block ² (m)	Coupling Nut Length (m)	Bearing Block (m)	Nut and Washer ⁴ (m)	Adjustment (m)	Tapped End (m)	Required Rod Length (m)	Adjusted Rod Length (m)
51	6.796	0.442	0.140	0.150	0.105	0.800	0.060	8.493	8.500
52	6.995	0.437	0.140	0.150	0.105	0.800	0.060	8.687	8.700
53	7.134	0.471	0.140	0.150	0.105	0.800	0.060	8.860	8.900
54	7.439	0.540	0.140	0.150	0.105	0.800	0.060	9.234	9.300
55	7.509	0.454	0.140	0.150	0.105	0.800	0.060	9.218	9.300
56	7.189	0.446	0.140	0.150	0.105	0.800	0.060	8.890	8.900
57	6.955	0.440	0.140	0.150	0.105	0.800	0.060	8.650	8.700
58	6.782	0.446	0.140	0.150	0.105	0.800	0.060	8.483	8.500
59	6.782	0.445	0.140	0.150	0.105	0.800	0.060	8.482	8.500
60	6.764	0.430	0.140	0.150	0.105	0.800	0.060	8.449	8.500
61	6.835	0.433	0.140	0.150	0.105	0.800	0.060	8.523	8.600
62	6.995	0.435	0.140	0.150	0.105	0.800	0.060	8.685	8.700
63	7.245	0.440	0.140	0.150	0.105	0.800	0.060	8.940	9.000
64	7.249	0.440	0.140	0.150	0.105	0.800	0.060	8.944	9.000
65	7.370	0.493	0.140	0.150	0.105	0.800	0.060	9.118	9.200
66	7.085	0.477	0.140	0.150	0.105	0.800	0.060	8.817	8.900
67	6.890	0.462	0.140	0.150	0.105	0.800	0.060	8.607	8.700
68	6.815	0.434	0.140	0.150	0.105	0.800	0.060	8.504	8.600
69	6.761	0.429	0.140	0.150	0.105	0.800	0.060	8.445	8.500
70	6.797	0.440	0.140	0.150	0.105	0.800	0.060	8.492	8.500
71	6.921	0.456	0.140	0.150	0.105	0.800	0.060	8.632	8.700
72	6.924	0.454	0.140	0.150	0.105	0.800	0.060	8.633	8.700
73	7.137	0.470	0.140	0.150	0.105	0.800	0.060	8.862	8.900
74	7.512	0.462	0.140	0.150	0.105	0.800	0.060	9.219	9.300
75	7.191	0.445	0.140	0.150	0.105	0.800	0.060	8.891	8.900
76	7.086	0.476	0.140	0.150	0.105	0.800	0.060	8.817	8.900
77	6.890	0.460	0.140	0.150	0.105	0.800	0.060	8.605	8.700
78	6.785	0.443	0.140	0.150	0.105	0.800	0.060	8.483	8.500
79	6.766	0.429	0.140	0.150	0.105	0.800	0.060	8.450	8.500
80	6.836	0.431	0.140	0.150	0.105	0.800	0.060	8.522	8.600
81	6.838	0.429	0.140	0.150	0.105	0.800	0.060	8.522	8.600
82	6.998	0.434	0.140	0.150	0.105	0.800	0.060	8.687	8.700
83	7.248	0.438	0.140	0.150	0.105	0.800	0.060	8.941	9.000
84	7.512	0.450	0.140	0.150	0.105	0.800	0.060	9.217	9.300
85	7.192	0.443	0.140	0.150	0.105	0.800	0.060	8.890	8.900
86	6.960	0.438	0.140	0.150	0.105	0.800	0.060	8.653	8.700
87	6.818	0.431	0.140	0.150	0.105	0.800	0.060	8.504	8.600
88	6.763	0.427	0.140	0.150	0.105	0.800	0.060	8.445	8.500
89	6.765	0.426	0.140	0.150	0.105	0.800	0.060	8.446	8.500
90	6.800	0.439	0.140	0.150	0.105	0.800	0.060	8.494	8.500
91	6.925	0.453	0.140	0.150	0.105	0.800	0.060	8.633	8.700
92	7.137	0.469	0.140	0.150	0.105	0.800	0.060	8.861	8.900
93	7.376	0.491	0.140	0.150	0.105	0.800	0.060	9.122	9.200
94	7.091	0.473	0.140	0.150	0.105	0.800	0.060	8.819	8.900
95	6.894	0.458	0.140	0.150	0.105	0.800	0.060	8.607	8.700
96	6.895	0.458	0.140	0.150	0.105	0.800	0.060	8.608	8.700
97	6.789	0.442	0.140	0.150	0.105	0.800	0.060	8.486	8.500
98	6.770	0.427	0.140	0.150	0.105	0.800	0.060	8.452	8.500
99	6.842	0.428	0.140	0.150	0.105	0.800	0.060	8.525	8.600
100	6.999	0.433	0.140	0.150	0.105	0.800	0.060	8.687	8.700
101	7.519	0.448	0.140	0.150	0.105	0.800	0.060	9.222	9.300
102	7.197	0.441	0.140	0.150	0.105	0.800	0.060	8.893	8.900
103	6.964	0.436	0.140	0.150	0.105	0.800	0.060	8.655	8.700

Strand No.	North Anchorage								
	AWC Anchor Length ¹ (m)	CL Anchor Plate to Bearing Block ² (m)	Coupling Nut Length (m)	Bearing Block (m)	Nut and Washer ⁴ (m)	Adjustment (m)	Tapped End (m)	Required Rod Length (m)	Adjusted Rod Length (m)
104	6.965	0.435	0.140	0.150	0.105	0.800	0.060	8.655	8.700
105	6.822	0.430	0.140	0.150	0.105	0.800	0.060	8.507	8.600
106	6.769	0.424	0.140	0.150	0.105	0.800	0.060	8.448	8.500
107	6.803	0.437	0.140	0.150	0.105	0.800	0.060	8.495	8.500
108	7.000	0.431	0.140	0.150	0.105	0.800	0.060	8.686	8.700
109	7.245	0.437	0.140	0.150	0.105	0.800	0.060	8.937	9.000
110	7.381	0.489	0.140	0.150	0.105	0.800	0.060	9.125	9.200
111	7.380	0.489	0.140	0.150	0.105	0.800	0.060	9.124	9.200
112	7.095	0.474	0.140	0.150	0.105	0.800	0.060	8.824	8.900
113	6.902	0.457	0.140	0.150	0.105	0.800	0.060	8.614	8.700
114	6.793	0.441	0.140	0.150	0.105	0.800	0.060	8.489	8.500
115	6.772	0.426	0.140	0.150	0.105	0.800	0.060	8.453	8.500
116	6.845	0.427	0.140	0.150	0.105	0.800	0.060	8.527	8.600
117	7.135	0.466	0.140	0.150	0.105	0.800	0.060	8.856	8.900
118	7.523	0.447	0.140	0.150	0.105	0.800	0.060	9.225	9.300
119	7.201	0.440	0.140	0.150	0.105	0.800	0.060	8.896	8.900
120	7.099	0.472	0.140	0.150	0.105	0.800	0.060	8.826	8.900
121	6.826	0.428	0.140	0.150	0.105	0.800	0.060	8.509	8.600
122	6.831	0.427	0.140	0.150	0.105	0.800	0.060	8.513	8.600
123	6.777	0.424	0.140	0.150	0.105	0.800	0.060	8.456	8.500
124	6.926	0.451	0.140	0.150	0.105	0.800	0.060	8.632	8.700
125	7.527	0.445	0.140	0.150	0.105	0.800	0.060	9.227	9.300
126	7.205	0.439	0.140	0.150	0.105	0.800	0.060	8.899	8.900
127	6.972	0.433	0.140	0.150	0.105	0.800	0.060	8.660	8.700
128	6.975	0.432	0.140	0.150	0.105	0.800	0.060	8.662	8.700
129	6.798	0.439	0.140	0.150	0.105	0.800	0.060	8.492	8.500
130	6.807	0.435	0.140	0.150	0.105	0.800	0.060	8.497	8.500
131	7.389	0.488	0.140	0.150	0.105	0.800	0.060	9.132	9.200
132	7.529	0.444	0.140	0.150	0.105	0.800	0.060	9.228	9.300
133	7.209	0.437	0.140	0.150	0.105	0.800	0.060	8.901	9.000
134	6.909	0.455	0.140	0.150	0.105	0.800	0.060	8.619	8.700
135	6.776	0.423	0.140	0.150	0.105	0.800	0.060	8.454	8.500
136	7.392	0.486	0.140	0.150	0.105	0.800	0.060	9.133	9.200
137	7.106	0.470	0.140	0.150	0.105	0.800	0.060	8.831	8.900

Notes:

1. Anchor rod lengths are based on the lengths provided in Ammann & Whitney Cable Strand Length calculations dated April 1, 2009. These lengths have been adjusted to provide +/-800mm of adjustment at each anchor rod.
2. The anchor plate stiffener lengths are based upon approved shop drawings.
3. Strand numbers correspond to ABFJV's erection sequence numbers as defined in ABF-RFI-000712R02.
4. The length of the anchor rod nut and washer is in accordance with the spherical nut and washer approved in ABF-RFI-001644R04.

Final Main Cable Anchor Rod Lengths (South Anchorage)

Strand No.	South Anchorage								
	AWC Anchor Length ¹ (m)	CL Anchor Plate to Bearing Block ² (m)	Coupling Nut Length (m)	Bearing Block (m)	Nut and Washer ⁴ (m)	Adjustment (m)	Tapped End (m)	Required Rod Length (m)	Adjusted Rod Length (m)
1	7.075	0.442	0.140	0.150	0.105	0.800	0.060	8.772	8.800
2	7.361	0.481	0.140	0.150	0.105	0.800	0.060	9.097	9.100
3	7.628	0.552	0.140	0.150	0.105	0.800	0.060	9.435	9.500
4	7.656	0.510	0.140	0.150	0.105	0.800	0.060	9.421	9.500
5	7.183	0.464	0.140	0.150	0.105	0.800	0.060	8.902	9.000
6	7.457	0.449	0.140	0.150	0.105	0.800	0.060	9.161	9.200
7	7.728	0.546	0.140	0.150	0.105	0.800	0.060	9.529	9.600
8	7.120	0.459	0.140	0.150	0.105	0.800	0.060	8.834	8.900
9	7.090	0.447	0.140	0.150	0.105	0.800	0.060	8.792	8.800
10	7.245	0.444	0.140	0.150	0.105	0.800	0.060	8.944	9.000
11	7.240	0.444	0.140	0.150	0.105	0.800	0.060	8.939	9.000
12	7.455	0.448	0.140	0.150	0.105	0.800	0.060	9.158	9.200
13	7.756	0.506	0.140	0.150	0.105	0.800	0.060	9.517	9.600
14	7.251	0.477	0.140	0.150	0.105	0.800	0.060	8.983	9.000
15	7.084	0.438	0.140	0.150	0.105	0.800	0.060	8.777	8.800
16	7.118	0.439	0.140	0.150	0.105	0.800	0.060	8.812	8.900
17	7.113	0.439	0.140	0.150	0.105	0.800	0.060	8.807	8.900
18	7.358	0.480	0.140	0.150	0.105	0.800	0.060	9.093	9.100
19	7.450	0.445	0.140	0.150	0.105	0.800	0.060	9.150	9.200
20	7.749	0.508	0.140	0.150	0.105	0.800	0.060	9.512	9.600
21	7.467	0.494	0.140	0.150	0.105	0.800	0.060	9.216	9.300
22	7.164	0.442	0.140	0.150	0.105	0.800	0.060	8.861	8.900
23	7.079	0.437	0.140	0.150	0.105	0.800	0.060	8.771	8.800
24	7.086	0.438	0.140	0.150	0.105	0.800	0.060	8.779	8.800
25	7.180	0.454	0.140	0.150	0.105	0.800	0.060	8.889	8.900
26	7.353	0.474	0.140	0.150	0.105	0.800	0.060	9.082	9.100
27	7.618	0.548	0.140	0.150	0.105	0.800	0.060	9.421	9.500
28	7.616	0.541	0.140	0.150	0.105	0.800	0.060	9.412	9.500
29	7.581	0.453	0.140	0.150	0.105	0.800	0.060	9.289	9.300
30	7.330	0.448	0.140	0.150	0.105	0.800	0.060	9.033	9.100
31	7.116	0.456	0.140	0.150	0.105	0.800	0.060	8.827	8.900
32	7.072	0.438	0.140	0.150	0.105	0.800	0.060	8.765	8.800
33	7.107	0.435	0.140	0.150	0.105	0.800	0.060	8.797	8.800
34	7.235	0.440	0.140	0.150	0.105	0.800	0.060	8.930	9.000
35	7.233	0.438	0.140	0.150	0.105	0.800	0.060	8.926	9.000
36	7.447	0.443	0.140	0.150	0.105	0.800	0.060	9.145	9.200
37	7.746	0.502	0.140	0.150	0.105	0.800	0.060	9.503	9.600
38	7.325	0.447	0.140	0.150	0.105	0.800	0.060	9.027	9.100
39	7.159	0.442	0.140	0.150	0.105	0.800	0.060	8.856	8.900
40	7.075	0.434	0.140	0.150	0.105	0.800	0.060	8.764	8.800
41	7.081	0.442	0.140	0.150	0.105	0.800	0.060	8.778	8.800
42	7.173	0.459	0.140	0.150	0.105	0.800	0.060	8.887	8.900
43	7.171	0.455	0.140	0.150	0.105	0.800	0.060	8.881	8.900
44	7.350	0.472	0.140	0.150	0.105	0.800	0.060	9.077	9.100
45	7.610	0.540	0.140	0.150	0.105	0.800	0.060	9.405	9.500
46	7.467	0.488	0.140	0.150	0.105	0.800	0.060	9.210	9.300
47	7.250	0.466	0.140	0.150	0.105	0.800	0.060	8.971	9.000
48	7.113	0.453	0.140	0.150	0.105	0.800	0.060	8.821	8.900
49	7.067	0.438	0.140	0.150	0.105	0.800	0.060	8.760	8.800
50	7.065	0.437	0.140	0.150	0.105	0.800	0.060	8.757	8.800
51	7.106	0.433	0.140	0.150	0.105	0.800	0.060	8.794	8.800
52	7.228	0.436	0.140	0.150	0.105	0.800	0.060	8.919	9.000
53	7.440	0.442	0.140	0.150	0.105	0.800	0.060	9.137	9.200
54	7.738	0.500	0.140	0.150	0.105	0.800	0.060	9.493	9.500
55	7.581	0.452	0.140	0.150	0.105	0.800	0.060	9.288	9.300
56	7.322	0.443	0.140	0.150	0.105	0.800	0.060	9.020	9.100
57	7.157	0.438	0.140	0.150	0.105	0.800	0.060	8.850	8.900
58	7.152	0.437	0.140	0.150	0.105	0.800	0.060	8.844	8.900

Strand No.	South Anchorage								
	AWC Anchor Length ¹ (m)	CL Anchor Plate to Bearing Block ² (m)	Coupling Nut Length (m)	Bearing Block (m)	Nut and Washer ³ (m)	Adjustment (m)	Tapped End (m)	Required Rod Length (m)	Adjusted Rod Length (m)
59	7.073	0.433	0.140	0.150	0.105	0.800	0.060	8.761	8.800
60	7.079	0.441	0.140	0.150	0.105	0.800	0.060	8.775	8.800
61	7.167	0.454	0.140	0.150	0.105	0.800	0.060	8.876	8.900
62	7.344	0.470	0.140	0.150	0.105	0.800	0.060	9.069	9.100
63	7.439	0.440	0.140	0.150	0.105	0.800	0.060	9.134	9.200
64	7.736	0.499	0.140	0.150	0.105	0.800	0.060	9.490	9.500
65	7.464	0.485	0.140	0.150	0.105	0.800	0.060	9.204	9.300
66	7.247	0.468	0.140	0.150	0.105	0.800	0.060	8.970	9.000
67	7.242	0.468	0.140	0.150	0.105	0.800	0.060	8.965	9.000
68	7.111	0.452	0.140	0.150	0.105	0.800	0.060	8.818	8.900
69	7.062	0.434	0.140	0.150	0.105	0.800	0.060	8.751	8.800
70	7.102	0.433	0.140	0.150	0.105	0.800	0.060	8.790	8.800
71	7.166	0.452	0.140	0.150	0.105	0.800	0.060	8.873	8.900
72	7.342	0.469	0.140	0.150	0.105	0.800	0.060	9.066	9.100
73	7.604	0.539	0.140	0.150	0.105	0.800	0.060	9.398	9.400
74	7.579	0.449	0.140	0.150	0.105	0.800	0.060	9.283	9.300
75	7.572	0.447	0.140	0.150	0.105	0.800	0.060	9.274	9.300
76	7.321	0.442	0.140	0.150	0.105	0.800	0.060	9.018	9.100
77	7.151	0.435	0.140	0.150	0.105	0.800	0.060	8.841	8.900
78	7.070	0.430	0.140	0.150	0.105	0.800	0.060	8.755	8.800
79	7.076	0.440	0.140	0.150	0.105	0.800	0.060	8.771	8.800
80	7.076	0.436	0.140	0.150	0.105	0.800	0.060	8.767	8.800
81	7.226	0.434	0.140	0.150	0.105	0.800	0.060	8.915	9.000
82	7.435	0.438	0.140	0.150	0.105	0.800	0.060	9.128	9.200
83	7.731	0.497	0.140	0.150	0.105	0.800	0.060	9.483	9.500
84	7.766	0.507	0.140	0.150	0.105	0.800	0.060	9.528	9.600
85	7.463	0.486	0.140	0.150	0.105	0.800	0.060	9.204	9.300
86	7.319	0.440	0.140	0.150	0.105	0.800	0.060	9.014	9.100
87	7.110	0.450	0.140	0.150	0.105	0.800	0.060	8.815	8.900
88	7.109	0.449	0.140	0.150	0.105	0.800	0.060	8.813	8.900
89	7.063	0.433	0.140	0.150	0.105	0.800	0.060	8.751	8.800
90	7.102	0.429	0.140	0.150	0.105	0.800	0.060	8.786	8.800
91	7.226	0.433	0.140	0.150	0.105	0.800	0.060	8.914	9.000
92	7.601	0.537	0.140	0.150	0.105	0.800	0.060	9.393	9.400
93	7.763	0.500	0.140	0.150	0.105	0.800	0.060	9.518	9.600
94	7.461	0.483	0.140	0.150	0.105	0.800	0.060	9.199	9.200
95	7.243	0.467	0.140	0.150	0.105	0.800	0.060	8.965	9.000
96	7.151	0.433	0.140	0.150	0.105	0.800	0.060	8.839	8.900
97	7.071	0.429	0.140	0.150	0.105	0.800	0.060	8.755	8.800
98	7.075	0.435	0.140	0.150	0.105	0.800	0.060	8.765	8.800
99	7.166	0.451	0.140	0.150	0.105	0.800	0.060	8.872	8.900
100	7.433	0.437	0.140	0.150	0.105	0.800	0.060	9.125	9.200
101	7.911	0.451	0.140	0.150	0.105	0.800	0.060	9.617	9.700
102	7.574	0.445	0.140	0.150	0.105	0.800	0.060	9.274	9.300
103	7.460	0.482	0.140	0.150	0.105	0.800	0.060	9.197	9.200
104	7.242	0.465	0.140	0.150	0.105	0.800	0.060	8.962	9.000
105	7.109	0.448	0.140	0.150	0.105	0.800	0.060	8.812	8.900
106	7.063	0.432	0.140	0.150	0.105	0.800	0.060	8.750	8.800
107	7.101	0.428	0.140	0.150	0.105	0.800	0.060	8.784	8.800
108	7.338	0.468	0.140	0.150	0.105	0.800	0.060	9.061	9.100
109	7.723	0.496	0.140	0.150	0.105	0.800	0.060	9.474	9.500
110	7.910	0.450	0.140	0.150	0.105	0.800	0.060	9.615	9.700
111	7.573	0.444	0.140	0.150	0.105	0.800	0.060	9.272	9.300
112	7.320	0.439	0.140	0.150	0.105	0.800	0.060	9.014	9.100
113	7.242	0.464	0.140	0.150	0.105	0.800	0.060	8.961	9.000
114	7.072	0.427	0.140	0.150	0.105	0.800	0.060	8.754	8.800
115	7.076	0.435	0.140	0.150	0.105	0.800	0.060	8.766	8.800
116	7.224	0.432	0.140	0.150	0.105	0.800	0.060	8.911	9.000
117	7.594	0.539	0.140	0.150	0.105	0.800	0.060	9.388	9.400
118	7.767	0.499	0.140	0.150	0.105	0.800	0.060	9.521	9.600
119	7.573	0.443	0.140	0.150	0.105	0.800	0.060	9.271	9.300

Strand No.	South Anchorage								
	AWC Anchor Length ¹ (m)	CL Anchor Plate to Bearing Block ² (m)	Coupling Nut Length (m)	Bearing Block (m)	Nut and Washer ⁴ (m)	Adjustment (m)	Tapped End (m)	Required Rod Length (m)	Adjusted Rod Length (m)
120	7.321	0.437	0.140	0.150	0.105	0.800	0.060	9.013	9.100
121	7.155	0.432	0.140	0.150	0.105	0.800	0.060	8.842	8.900
122	7.112	0.447	0.140	0.150	0.105	0.800	0.060	8.814	8.900
123	7.102	0.426	0.140	0.150	0.105	0.800	0.060	8.783	8.800
124	7.337	0.467	0.140	0.150	0.105	0.800	0.060	9.059	9.100
125	7.911	0.449	0.140	0.150	0.105	0.800	0.060	9.615	9.700
126	7.464	0.481	0.140	0.150	0.105	0.800	0.060	9.200	9.200
127	7.572	0.442	0.140	0.150	0.105	0.800	0.060	9.269	9.300
128	7.245	0.464	0.140	0.150	0.105	0.800	0.060	8.964	9.000
129	7.074	0.426	0.140	0.150	0.105	0.800	0.060	8.755	8.800
130	7.164	0.451	0.140	0.150	0.105	0.800	0.060	8.870	8.900
131	7.768	0.498	0.140	0.150	0.105	0.800	0.060	9.521	9.600
132	7.909	0.448	0.140	0.150	0.105	0.800	0.060	9.612	9.700
133	7.463	0.481	0.140	0.150	0.105	0.800	0.060	9.199	9.200
134	7.157	0.431	0.140	0.150	0.105	0.800	0.060	8.843	8.900
135	7.066	0.431	0.140	0.150	0.105	0.800	0.060	8.752	8.800
136	7.766	0.499	0.140	0.150	0.105	0.800	0.060	9.520	9.600
137	7.324	0.436	0.140	0.150	0.105	0.800	0.060	9.015	9.100

Notes:

1. Anchor rod lengths are based on the lengths provided in Ammann & Whitney Cable Strand Length calculations dated April 1, 2009. These lengths have been adjusted to provide +/-800mm of adjustment at each anchor rod.
2. The anchor plate stiffener lengths are based upon approved shop drawings.
3. Strand numbers correspond to ABFJV's erection sequence numbers as defined in ABF-RFI-000712R02.
4. The length of the anchor rod nut and washer is in accordance with the spherical nut and washer approved in ABF-RFI-001644R04.

DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES

Office of Structural Materials

Quality Assurance and Source Inspection



Bay Area Branch
 690 Walnut Ave. St. 150
 Vallejo, CA 94592-1133
 (707) 649-5453
 (707) 649-5493

Contract #: 04-0120F4Cty: SF/ALA Rte: 80 PM: 13.2/13.9File #: 765**SOURCE INSPECTION REPORT****Resident Engineer:** Siegenthaler, Peter**Address:** 333 Burma Road**City:** Oakland, CA 94607**Report No:** SIR-003294**Date Inspected:** 19-May-2011**Project Name:** SAS Superstructure**OSM Arrival Time:** 800**Prime Contractor:** American Bridge/Fluor Enterprises, a JV**OSM Departure Time:** 1630**Contractor:** Dyson Corp. & Subs**Location:** Painesville, OH

Quality Control Contact: Russell Welsh
Material transfer: Yes No N/A
Stock Transfer: Yes No N/A
Rebar Test Witness: Yes No N/A

Quality Control Present: Yes No
Sampled Items: Yes No N/A
OK to Cut: Yes No N/A
Delayed/Cancelled: Yes No N/A

Other:**Bridge No:** 34-0006**Component:** Main Cable Anchor Rods**Bid Item:** 66**Lot No:****Summary of Items Observed:**

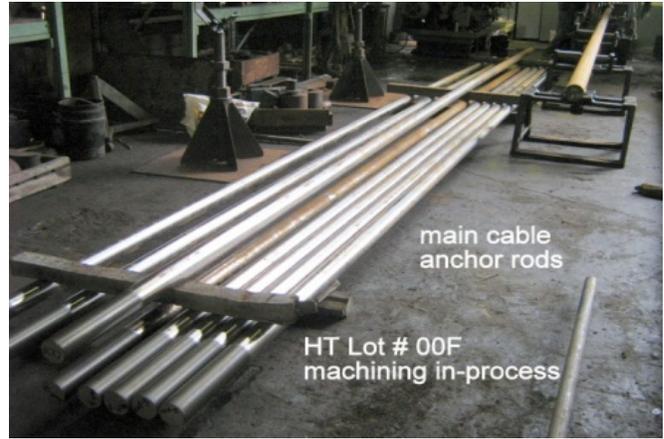
On this date, Quality Assurance Inspector Fred Edmondson was present at Dyson Corporation in Painesville, OH, as requested, to monitor the fabrication of the main cable PWS anchor rods for the San Francisco Oakland Bay Bridge (SFOBB) project.

QA inspector met with Dyson QC Manager Russell Welsh and Dyson Sales Manager Pat Sheffield who accompanied this QA inspector to the location where machining of main cable anchor rods was in-process.

This QA inspector observed the in-process machining of main cable anchor rods. This QA inspector verified the rods comply with ASTM A354 Grade BD. The heat number of the Lot of 42 rods is 4M76368. Dyson assigned Lot No.00F to this Lot. The Dyson Lot Numbers are assigned per Heat Treatment Lot per contract document requirements.

SOURCE INSPECTION REPORT

(Continued Page 2 of 2)



Summary of Conversations:

This QA inspector discussed the sampling requirements (Attachment: State Letter 05.03.01-002360-14July2008) and the magnetic particle testing (MT) requirements (CC0 991) with QC Manager Welsh and Sales Manager Sheffield. This QA inspector agreed with QC Manager Welsh and Sales Manager Sheffield's request to sample the rods and select the rods to be tested by MT after each heat treatment Lot is machined.

Comments

This report is for the purpose of determining conformance with the contract documents and is not for the purpose of making repair or fit for purpose recommendations. Should you require recommendations concerning repairs or remedial efforts please contact Nina Choy 510-385-5910, who represents the Office of Structural Materials for your project.

Inspected By:	Edmondson,Fred	Quality Assurance Inspector
Reviewed By:	Levell,Bill	QA Reviewer

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Contract #: 04-0120F4Cty: SF/ALA Rte: 80 PM: 13.2/13.9File #: 76.15**SOURCE INSPECTION REPORT****Resident Engineer:** Siegenthaler, Peter**Address:** 333 Burma Road**City:** Oakland, CA 94607**Report No:** SIR-003305**Date Inspected:** 24-May-2011**Project Name:** SAS Superstructure**Prime Contractor:** American Bridge/Fluor Enterprises, a JV**Contractor:** Dyson Corp. & Subs**OSM Arrival Time:** 800**OSM Departure Time:** 1630**Location:** Painesville, OH**Quality Control Contact:****Material transfer:** Yes No N/A**Stock Transfer:** Yes No N/A**Rebar Test Witness:** Yes No N/A**Other:****Bridge No:** 34-0006**Bid Item:** 66**Quality Control Present:** Yes No**Sampled Items:** Yes No N/A**OK to Cut:** Yes No N/A**Delayed/Cancelled:** Yes No N/A**Component:** main cable anchor rods**Lot No:** B305-017-11**Summary of Items Observed:**

On this date, Quality Assurance Inspector Fred Edmondson was present at Dyson Corporation in Painesville, OH as requested to monitor the fabrication of various high strength rods, bolts and washers for the San Francisco Oakland Bay Bridge (SFOBB) project.

This (QA) Inspector met with Dyson Corporation Quality Control (QC) Manager Mr. Russell Welsh and accompanied QC Manager Welsh to the location where machining activities were in-process. The items in-process were 3.5 inch main cable anchor rods. This QA inspector performed a random visual inspection of the anchor rods and selected one anchor rod for sampling. The frequency of sampling was in conformance with contract documents and included one 1200mm finished (threaded) section and two 300mm raw round stock from the selected rod.

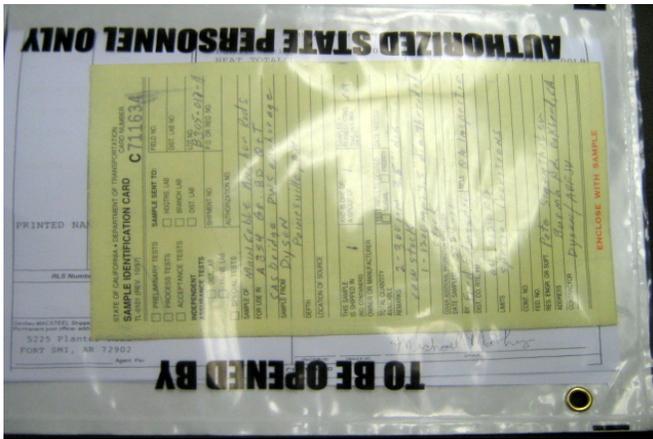
This QA inspector reviewed the supporting documentation and verified that the anchor rod material conformed to A354 Gr. BD quench & tempered round stock. The heat number of this lot is 4M76368 and the Dyson (per heat treatment) Lot Number is 00F.

The sampled coupons were placed in a cardboard box. The box was closed-up and attached to a wooden pallet with steel bands for shipment to the Caltrans translab.

A TL 101 with supporting documentation was placed into a pouch and attached to the box. This QA inspector assigned Lot No. B305-017-11 this sample shipment.

SOURCE INSPECTION REPORT

(Continued Page 2 of 2)



Summary of Conversations:

Conversation fundamental to completion of the task at hand occurred between this QA inspector and Dyson Personnel.

Comments

This report is for the purpose of determining conformance with the contract documents and is not for the purpose of making repair or fit for purpose recommendations. Should you require recommendations concerning repairs or remedial efforts please contact Nina Choy 510-385-5910, who represents the Office of Structural Materials for your project.

Inspected By: Edmondson, Fred

Quality Assurance Inspector

Reviewed By: Levell, Bill

QA Reviewer

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(707) 649-5453
(707) 649-5493

Contract #: 04-0120F4Cty: SF/ALA Rte: 80 PM: 13.2/13.9File #: 76.15**SOURCE INSPECTION REPORT****Resident Engineer:** Siegenthaler, Peter**Address:** 333 Burma Road**City:** Oakland, CA 94607**Report No:** SIR-003350**Date Inspected:** 03-Jun-2011**Project Name:** SAS Superstructure**Prime Contractor:** American Bridge/Fluor Enterprises, a JV**Contractor:** Dyson Corp. & Subs**OSM Arrival Time:** 800**OSM Departure Time:** 1630**Location:** Painesville, Ohio

Quality Control Contact: Russel Welch
Material transfer: Yes No N/A
Stock Transfer: Yes No N/A
Rebar Test Witness: Yes No N/A

Quality Control Present: Yes No
Sampled Items: Yes No N/A
OK to Cut: Yes No N/A
Delayed/Cancelled: Yes No N/A

Other:**Bridge No:** 34-0006**Bid Item:** 68**Component:** High Strength Fasteners**Lot No:** B337-004-11**Summary of Items Observed:**

On this date, Quality Assurance Inspector (QAI) Dustyn Broening was present at Dyson Corporation in Painesville, Ohio as requested to monitor the fabrication of various high strength rods, bolts and washers for the San Francisco Oakland Bay Bridge (SFOBB) project.

This QAI met with Dyson Corporation Quality Control Manager (QCM) Mr. Russell Welsh and accompanied QC Manager Welsh to the location where machining activities were in-process. The items in-process were 3.5 inch main cable anchor rods. This QA inspector performed a random visual inspection of the anchor rods and selected one anchor rod for sampling. The frequency of sampling was in conformance with contract documents and included one 1200mm finished (threaded) section and two 300mm raw round stock from the selected rod.

This QA inspector reviewed the supporting documentation and verified that the anchor rod material conformed to A354 Gr. BD quench & tempered round stock. The heat number of this lot is 4M76368 and the Dyson (per heat treatment) Lot Number is 00H.

The sampled coupons were placed in a cardboard box. The box was closed-up and attached to a wooden pallet with steel bands for shipment to the Caltrans translab.

A TL 101 with supporting documentation was placed into a pouch and attached to the box. This QA inspector assigned Lot No. B337-004-11 to this sample shipment.

This QAI also randomly selected four anchor rods from each of the heat treat lots #00F and 00H. The QCM has

SOURCE INSPECTION REPORT

(Continued Page 2 of 3)

tagged these rods to be set aside and to be prepared for fluorescent Magnetic Particle testing (MT). MT testing is to be performed on the evening of 6/06/11. See attached photos.



3.5" diameter ASTM A354 Grade BD, Q&T Anchor Rods
Samples for MT testing for Heat #4M76368, Heat treat lot #00H
(1) Sample within Photo. A total of (4) selected per ASTM F1470-09 Table 3.



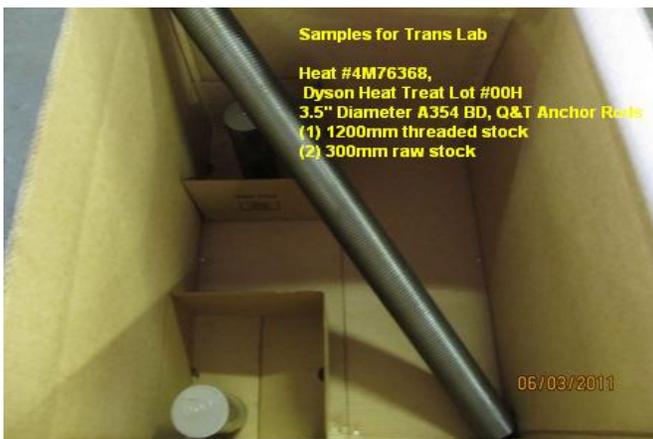
3.5" Diameter ASTM A354 Grade BD, Q&T Anchor Rod
Sample for MT testing for Heat #4M76368,
Heat Treat lot #00H
(1) Sample within Photo. A total of (4) selected per ASTM F1470-09, Table 3.



3.5" Diameter ASTM A354 grade BD, Q&T Anchor Rods
Sample for MT Testing for Heat #4M76368, Heat Treat Lot #00H
(1) Sample selected and within photo per ASTM F1470-09, Table 3.



3.5" Diameter ASTM A354 Grade BD, Q&T Anchor Rods
Sample for MT Testing for Heat #4M76368, Heat Treat Lot #00H
(1) Sample selected and within photo per ASTM F1470-09, Table 3.



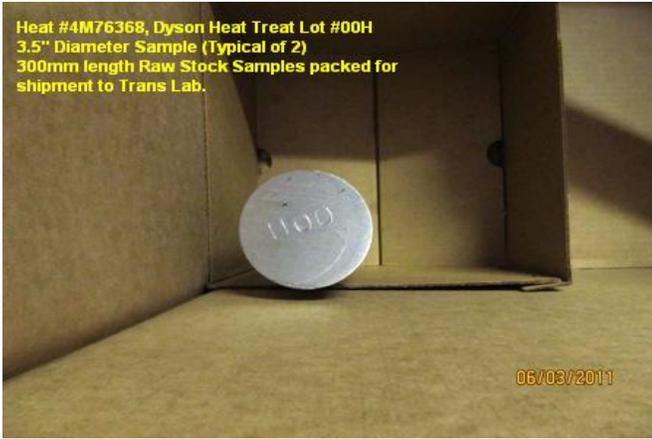
Samples for Trans Lab
Heat #4M76368,
Dyson Heat Treat Lot #00H
3.5" Diameter A354 BD, Q&T Anchor Rods
(1) 1200mm threaded stock
(2) 300mm raw stock



Samples for Trans Lab
Heat #4M76368,
Dyson Heat Treat Lot #00H
3.5" Diameter A354 BD, Q&T Anchor Rods
(1) 1200mm threaded stock
(2) 300mm raw stock

SOURCE INSPECTION REPORT

(Continued Page 3 of 3)



Summary of Conversations:

Conversation fundamental to completion of the task at hand occurred between this QA inspector and Dyson personnel.

Comments

This report is for the purpose of determining conformance with the contract documents and is not for the purpose of making repair or fit for purpose recommendations. Should you require recommendations concerning repairs or remedial efforts please contact Nina Choy 510-385-5910, who represents the Office of Structural Materials for your project.

Inspected By:	Broening,Dustyn	Quality Assurance Inspector
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Reviewed By:	Levell,Bill	QA Reviewer
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DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES

Office of Structural Materials

Quality Assurance and Source Inspection



Bay Area Branch
690 Walnut Ave. St. 150
Vallejo, CA 94592-1133
(707) 649-5453
(707) 649-5493

Contract #: 04-0120F4Cty: SF/ALA Rte: 80 PM: 13.2/13.9File #: 76.15**SOURCE INSPECTION REPORT****Resident Engineer:** Siegenthaler, Peter**Address:** 333 Burma Road**City:** Oakland, CA 94607**Report No:** SIR-003356**Date Inspected:** 06-Jun-2011**Project Name:** SAS Superstructure**OSM Arrival Time:** 1900**Prime Contractor:** American Bridge/Fluor Enterprises, a JV**OSM Departure Time:** 330**Contractor:** Dyson Corp. & Subs**Location:** Painesville, OH

Quality Control Contact: Russel Welch
Material transfer: Yes No N/A
Stock Transfer: Yes No N/A
Rebar Test Witness: Yes No N/A

Quality Control Present: Yes No
Sampled Items: Yes No N/A
OK to Cut: Yes No N/A
Delayed/Cancelled: Yes No N/A

Other:**Bridge No:** 34-0006**Component:** Main cable anchor rods**Bid Item:** 66**Lot No:****Summary of Items Observed:**

On this date, Quality Assurance Inspector (QAI) Dustyn Broening was present at Dyson Corporation in Painesville, OH as requested to monitor the MT testing of various high strength rods, bolts and washers for the San Francisco Oakland Bay Bridge (SFOBB) project.

This QAI met with Dyson Corporation Quality Control Manager (QCM) Mr. Russell Welsh and Stork Herron Testing Laboratories NDT manager Level III (NDT tech), Matt Novak. This QAI accompanied QCM and NDT tech to the location where Fluorescent MT testing was to be performed. The items to be tested were 3.5 inch main cable anchor rods, a quantity of (4 ea) from each heat treat lots #00F and #00H which were selected by this QAI on 6/3/11.

This QAI observed NDT tech, perform MT testing and noted that Yoke used was a model DA 400 serial No. 3005 and magnetizing current was DC. The wet fluorescent MT particles were 14AM Magnaflo Prepared bath, part No. 01-0145-79, lot No. 09D02K. NDT tech has not provided this QAI copies of equipment calibration that was used, NDT certification of technician or MT procedure. Dyson QCM and NDT tech relayed to that copies will be forwarded to Dyson QCM, and that QCM will forward that information to this QAI as soon as possible.

MT inspection was observed to be performed by the NDT tech in accordance with ASTM E709, ASTM A490 and was observed to be in accordance with visual acceptance standards of ASTM Specification F788.

Summary of Conversations:

SOURCE INSPECTION REPORT

(Continued Page 2 of 2)

As noted in the body of the report above. Other basic communication was performed between this QAI and the QCM during this visit.

Comments

This report is for the purpose of determining conformance with the contract documents and is not for the purpose of making repair or fit for purpose recommendations. Should you require recommendations concerning repairs or remedial efforts please contact Nina Choy 510-385-5910, who represents the Office of Structural Materials for your project.

Inspected By:	Broening,Dustyn	Quality Assurance Inspector
Reviewed By:	Levell,Bill	QA Reviewer

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 (707) 649-5493

Contract #: 04-0120F4Cty: SF/ALA Rte: 80 PM: 13.2/13.9File #: 76.15**SOURCE INSPECTION REPORT****Resident Engineer:** Siegenthaler, Peter**Address:** 333 Burma Road**City:** Oakland, CA 94607**Report No:** SIR-003370**Date Inspected:** 09-Jun-2011**Project Name:** SAS Superstructure**Prime Contractor:** American Bridge/Fluor Enterprises, a JV**Contractor:** Dyson Corp. & Subs**OSM Arrival Time:** 800**OSM Departure Time:** 1630**Location:** Painesville, Ohio

Quality Control Contact: Russel Welch
Material transfer: Yes No N/A
Stock Transfer: Yes No N/A
Rebar Test Witness: Yes No N/A

Quality Control Present: Yes No
Sampled Items: Yes No N/A
OK to Cut: Yes No N/A
Delayed/Cancelled: Yes No N/A

Other:**Bridge No:** 34-0006**Bid Item:** 66**Component:** Main Cable Anchor Rods PWS**Lot No:****Summary of Items Observed:**

On this date, Quality Assurance Inspector (QAI) Dustyn Broening was present at Dyson Corporation in Painesville, OH, as requested, to monitor the fabrication of the main cable PWS anchor rods for the San Francisco Oakland Bay Bridge (SFOBB) project.

This QAI met with Dyson QC Manager (QCM) Russel Welsh who accompanied this QAI to the location where machining of main cable anchor rods was in-process.

This QAI observed the in-process machining of main cable anchor rods. This QA inspector verified the rods comply with ASTM A354 Grade BD. The heat number of the Lot of 41 rods is 4M76368. Dyson assigned Lot No. 00H to this Lot. The Dyson Lot Numbers are assigned per Heat Treatment Lot per contract document requirements.

SOURCE INSPECTION REPORT

(Continued Page 2 of 2)



Summary of Conversations:

The QCM relayed that the main cable anchor rods will be ready to ship to the galvanizing facility on Tuesday 6/14/11. QCM stated that a quantity of (29ea) from Dyson heat treat lot #00H, and (25ea) from #00F will be ready on this date. This QAI agreed with QCM to return to Dyson to review the supporting documents and observe the rods to be green tagged. This QAI also has not received copies of equipment calibration that was used, NDT certification of the technician or MT procedure for the MT inspection that was performed on 6/06/11. QCM said that he is in the process of collecting these NDT documents but has not received them at this time, but will forward to this QAI as soon as he receives them.

Comments

This report is for the purpose of determining conformance with the contract documents and is not for the purpose of making repair or fit for purpose recommendations. Should you require recommendations concerning repairs or remedial efforts please contact Nina Choy 510-385-5910, who represents the Office of Structural Materials for your project.

Inspected By:	Broening,Dustyn	Quality Assurance Inspector
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Reviewed By:	Levell,Bill	QA Reviewer
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State of California
Department of Transportation

Structural Materials Testing Laboratory
5900 Folsom Boulevard, Sacramento, CA 95819



TEST REPORT



CERTIFICATE NO. 2364.01

Remarks

ref: ASTM A354 Grade BD, TM 03. Heat #4M76368. Sample FAILS - Thread Pitch Diameter is Undersize.

Sample No: SM-11-0469
Date Sampled: 05/24/11 **Date Rec'd:** 06/02/11 **Date Reported:** 06/14/11
Lot No: B30501711 **TL-101 / SIC No:** C711634
Contract/Permit No: 04-0120F4
Material: 3.5"x 1200mm A354 Grade BD Main Cable Anchor Rods
Manufacturer: Dyson
Sampler: Fred Edmondson

6-14

Results: SAMPLE SUBMITTED DOES NOT COMPLY WITH SPECIFICATIONS.

SOURCE	DISTRICT	E.A.	SUB JOB	SPECIAL DESIGNATION	OBJECT
59318	04	0120F3			1270

11-0469

6-2

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION
SAMPLE IDENTIFICATION CARD
 TL-10101 (REV. 10/97) CARD NUMBER **C711634**

PRELIMINARY TESTS
 PROCESS TESTS ACCEPTANCE TESTS
 INDEPENDENT ASSURANCE TESTS

SAMPLE SENT TO:
 HDQTRS. LAB BRANCH LAB DIST. LAB
 SHIPMENT NO. _____ AUTHORIZATION NO. _____

FIELD NO. _____ **DIST. LAB. NO.** _____
LOT NO. B305-017-11 **P.O. OR REQ. NO.** _____

SAMPLE OF: Main Cable Anchor Rods
FOR USE IN: A354 Gr. BD P.T.
SAMPLE FROM: Dyson
 Painesville, OH

DEPTH: _____ **LOCATION OF SOURCE:** _____

THIS SAMPLE IS SHIPPED IN (NO. CONTAINERS) 1 **AND IS ONE OF A GROUP OF** 1 **SAMPLES REPRESENTING (TONS, GALS, BBLs, STA, ETC.)** ea

OWNER OR MANUFACTURER: _____ **DATE NEEDED:** _____

TOTAL QUANTITY AVAILABLE: _____ **TEST RESULTS DESIRED:** NORMAL PRIORITY

REMARKS: 2-300mm 3.5" dia new stock
 1-1200mm 3.5" dia threaded stock

COVER ADDITIONAL INFORMATION WITH LETTER
DATE SAMPLED: 5-24-11 **TITLE:** RA Inspector
BY: Fred Edmondson **DIST. CO. RTE. PM:** _____

LIMITS: 04-0120F4
 special provisions

CONT. NO.: _____ **FED. NO.:** _____

RES. ENGR. OR SUPT.: Pete Sigenthaler
ADDRESS: Burma Rd. Oakland, CA
CONTRACTOR: Dyson/AF2 JV

Lab Manager

Print

Quality Manager

ENCLOSE WITH SAMPLE

.505 SAMPLES



Department of Transportation
Structural Materials Testing Laboratory
UTM: BALDWIN 60 Kip

SM Number = 11-0469

Temperature _____

Sample	Heat Number	Diameter (in)	Area (in ²)	Stress at Offset (psi)	Tensile Strength (psi)	Elongation in 4 x d (%)	Tested By
368A	4M76368	0.501	0.1971	132477	155600	13.7	FSaylor
368B	4M76368	0.499	0.1956	135038	156460	16.3	FSaylor

14% min
13.7
16.3
AVG.
OK

OK

Fails - Pitch Diameter

FASTENER ASSEMBLY WORKSHEET

QUALITY MANAGER
Angelo H. Mantz

SM Number	11-0469	Lot Number	B2050711	Date Received	6/2/11
Contract Number	04-0120F4	TL-0101 Number	C711634	Date Tested	6/10/11
Lab Technician	FRED			Page <u>1</u> of <u>1</u>	

BOLTS: A354 GRADE BD

Sample No.	1A						
Heat / Mfg. Lot No.	4M76368						
Product Markings							
Size	3 1/2"						
Pitch Diameter	3.321 - 3.301						
Bolt Length							
Ring Gage Go/No-Go							
Zinc Coating Thick.							
Hardness: R_c / R_b	34.33	✓					
Spacing	✓	✓					
.500 Wedge Tensile							

*FAIL - Min. P.D. is 3.323
P.D. is tapered from 3.321 on one end to 3.301 at the other end.*

NUTS:

Sample No.							
Mfg. Lot No.							
Product Markings							
Size							
Plug Gage Go/No-Go							
Zinc Coating Thick.							
Hardness: R_c / R_b							
Spacing							
Nut Proof Load							

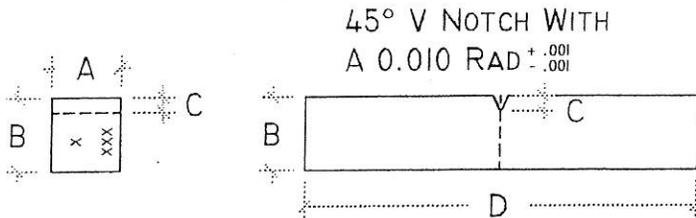
WASHER:

Sample No.							
Mfg. Lot No.							
Product Markings							
Zinc Coating Thick.							
Hardness: R_c / R_b							
Spacing							

Specimen Preparation Information

SM # 11-0469
EA # _____
HEAT # 368
PREPARED BY MA
DATE 6-8-11

Charpy Impact Specimens



MATERIAL SURFACE
SPEC #

x

HEAT #

xxx

NOTCH ORIENTATION

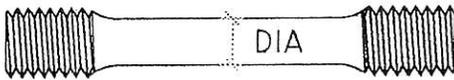
OK	
1	
2	
3	

SPC #	A	B	C	D
	NOTE #2	0.394 $\pm .001$ $- .001$	0.079 $\pm .001$ $- .001$	2.165 $\pm .000$ $- .100$
1				
2				
3				

NOTE:

- ALL MEASUREMENTS IN INCHES
- MEASUREMENT "A" 0.394, 0.295, 0.197, 0.098
TOLERANCE $\pm .001$
- SPECIMENS ARE TO BE SURFACE GROUND

Reduced Tensile Round Specimens



SPC #	DIA
A	.503
B	.500

NOTE: SPECIMEN DIA

- 0.500 $\pm .010$
 $- .010$
- 0.350 $\pm .007$
 $- .007$

Reduced Tensile Flat Specimens



SPC #	WIDTH
A	
B	

NOTE: SPECIMEN WIDTH

- 0.500 $\pm .010$

APPROVED FOR USE BY SMTL
QUALITY MANAGER
Agile B. Mantz



Master B/L NUMBER	
B/L NUMBER	302762
CUSTOMER P.O.	31637
ORDER NUMBER	142993
CUSTOMER NUMBER	205600

Page	1
DATE SHIPPED	3/23/11
LOADER	SCRF
<small>Subject to Section 2 of contract applicable bill of lading. If the shipment is to be delivered to the consignee without receipt, the consignee, the consignee shall sign the following statement. The carrier shall not make delivery of this shipment without payment of freight and all other lawful charges.</small>	
<small>Shippers interest in lieu of some other part of bill of lading approved by the Interstate Commerce Commission.</small>	
<small>If the shipment moves between two ports by either by water, the law requires that the bill of lading shall state whether it is "Carriage or Shipper's Weight". Note: Where the rate is dependent on value, shippers are required to state specifically in writing the agreed or declared value of the property. The agreed or declared value of the property is, however, specifically stated by the shipper to be not exceeding.</small>	
Signature of Consignor	
Per #3	to
<small>Apply in prepayment of the charges on the property described hereon.</small>	
Agent or Cashier	
Per	Per
<small>(The signature here acknowledges only the amount prepaid)</small>	<small>It charges are to be prepaid or stamp here "To Be Prepaid"</small>

This Memorandum is an acknowledgment that a Bill of Lading has been issued and is not the Original Bill of Lading. A copy or duplicate covering the property named herein and is intended solely for filing or record.

RECEIVED, subject to classifications and lawfully filed tariffs in effect on the date of the receipt by the carrier of the property described in the Original Bill of Lading.

The property described below, in apparent good order, as set forth as noted in contents and condition of contents of packages (unknown) marked, consigned and destined as indicated below, which said carrier (the word carrier being understood throughout this contract as meaning any person or corporation in possession of the property under the contract) agrees to carry to its usual place of delivery at said destination, if on its route, otherwise to deliver to another carrier on the route to said destination. It is mutually agreed as to each carrier of all or any of said property over all or any portion of said route to destination, and as each party at any time interested in all or any of said property, that every service to be performed hereunder shall be subject to all the terms and conditions of the Uniform Domestic Freight Bill of Lading (1917) in Official, Southern, Western and Basin Freight Classification in effect on the date hereof, if this is a rail or road water shipment or (2) in the applicable motor carrier classification or tariff if this is a motor carrier shipment. Shipper hereby certifies that he is familiar with all terms and conditions of the said bill of lading, including those on the back thereof, and that the classification or tariff which governs the transportation of this shipment and the said terms and conditions are hereby agreed to by the shipper and accepted for him and his agent.

SOLD TO SHIP TO (CONSIGNEE TO)

TURRET STEEL IND. INC. TURRET STEEL
 105 PINE STREET PICK UP AT MILL

IMPERIAL PA 15126-1142

CARRIER NAME	TRAILER/CAR NUMBER	SUPPLIER NUMBER
CPU	W0147	
ROUTING	F.O.B. POINT	FREIGHT
T FORT SMITH, AR	FORT SMITH	COLLECT
CUSTOMER SPEC.	CUSTOMER PART NUMBER	
ASTM A354-07 GRADE BD; Q&T; AIM RC 35 / 37; TSI-130 4/13/07		
SEE C.T.R. COMMENTS; HUNTINGTON HT. IS AWARE OF THIS JOB		

COLOR CODE	NONE	CERTIFICATION WITH SHIPMENT	YES
------------	------	-----------------------------	-----

HEAT NUMBER	GRADE	SIZE	LENGTH	UNITS	QTY/UNIT	TOTAL PIECES	WEIGHT
4M76368	4140	3.52000"	32' "	7	6	42	44184.00LB
DUE DATE:	3/14/11						
		Bundle #:	0001693962	0001693963	0001693964	0001693965	0001693965
			0001693966	0001693967	0001693968		
		Bundle Weight=	6312.00 LBS				
		HEAT TOTALS		7		42	44184.00LB
		44184.00LBS OF	109918LBS SHIPPED				

42 BARS

PRINTED NAME Andrew M. Wilson SIGNATURE Andrew M. Wilson DATE 3/23/11

RLS Number	PAGE TOTALS
	B/L TOTALS
	7 42 44184.00LB



GERDAU MACSTEEL Shipper. Per
 Permanent post officer address of shipper
 5225 Planter Road
 FORT SMI, AR 72902
 Agent Per

GOODS COVERED BY THIS B/L HAVE BEEN PLACED ON TRUCK SPECIFICALLY UNDER DRIVERS INSTRUCTIONS AND LOADED TO HIS SATISFACTION. THIS B/L MAY BE EXECUTED BY ELECTRONIC OR FACSIMILE SIGNATURE AND IN ANY NUMBER OF COUNTERPARTS, EACH SUCH COUNTERPART TO BE DEEMED AN ORIGINAL INSTRUMENT.

Michael Mathis
 DRIVER

CODE 00F

CERTIFIED MATERIAL TEST REPORT

CUSTOMER ORDER NUMBER 31637	CUSTOMER PART NUMBER	HEAT NUMBER 4M76368	WORK ORDER NUMBER 142993 102	DATE 3/23/11
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REPORT TO

TURRET STEEL IND. INC.
105 PINE STREET

SHIP TO

TURRET STEEL
PICK UP AT MILL

IMPERIAL , PA 15126-1142

ORDERED

GRADE 4140	SIZE 3.52"	LENGTH 32'
---------------	---------------	---------------

CUSTOMER SPECIFICATIONS

ASTM A354-07 GRADE BD; Q&T; AIM RC 35 / 37; TSI-130 4/13/07

CHEMICAL ANALYSIS

C	Mn	P	S	Si	Ni	Cr	Mo	Cu	Sn	Al
0.42	0.97	0.014	0.030	0.20	0.09	1.04	0.17	0.18	0.010	0.023
V	Cb	Ca	N2							
0.003	0.002	0.0013	0.0060							

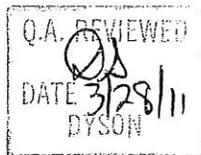
GRAIN SIZE SPECIFICATION ASTM E112 (5-8)

% OF GRAIN 5-8 AVG

M 100 7.0

HARDNESS SPECIFICATION Q&T (AIM 35-37RC)

CENTER	MID RADIUS	SURFACE	AVERAGE
32.0	35.9	38.7	35.5 HRC



We certify that these data are correct and in compliance with specified requirements.

CODE 00F

CERTIFIED MATERIAL TEST REPORT

CUSTOMER ORDER NUMBER 31637	CUSTOMER PART NUMBER	HEAT NUMBER 4M76368	WORK ORDER NUMBER 142993 102	DATE 3/23/11
--------------------------------	----------------------	------------------------	---------------------------------	-----------------

REPORT TO

TURRET STEEL IND. INC.
105 PINE STREET

SHIP TO

TURRET STEEL
PICK UP AT MILL

IMPERIAL , PA 15126-1142

ORDERED

GRADE 4140	SIZE 3.52"	LENGTH 32'
---------------	---------------	---------------

CUSTOMER SPECIFICATIONS
ASTM A354-07 GRADE BD; Q&T; AIM RC 35 / 37; TSI-130 4/13/07

HARDENABILITY SPECIFICATION ASTM A304

ACTUAL

J1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	18	20	22	24	26	28	30	32	34
57	56	56	56	55	54	54	54	53	52	51	51	49	49	47	46	45	43	41	40	39	38	38	37	

MACROCLEANLINESS SPECIFICATION ASTM E381 (S3-R2-C2)

PLATE I

PLATE II

	S	R	C	
AVERAGE	1	1	1	NONE

PHYSICALS SPECIFICATION ASTM A434

02.0 IN

TENSILE (KSI)	YIELD (KSI)	% ELONGATION	REDUCTION OF AREA
158.0	139.0	14.9	52.0

DI CALCULATION SPECIFICATION REPORT

5.706

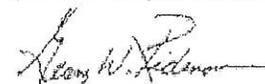
AUTO ULTRASONIC SPECIFICATION 100%



PAGE 2

We certify that these data are correct and in compliance with specified requirements.

Gerdau MacSteel Arkansas
5225 Planter Road
Fort Smith, AR 72902



Geary W. Ridenour

Quality Assurance Representative

CODE 00F

CERTIFIED MATERIAL TEST REPORT

CUSTOMER ORDER NUMBER 31637	CUSTOMER PART NUMBER	HEAT NUMBER 4M76368	WORK ORDER NUMBER 142993 102	DATE 3/23/11
--------------------------------	----------------------	------------------------	---------------------------------	-----------------

REPORT TO

SHIP TO

TURRET STEEL IND. INC.
105 PINE STREET

TURRET STEEL
PICK UP AT MILL

IMPERIAL , PA 15126-1142

ORDERED

GRADE 4140	SIZE 3.52"	LENGTH 32'
---------------	---------------	---------------

CUSTOMER SPECIFICATIONS
ASTM A354-07 GRADE BD; Q&T; AIM RC 35 / 37; TSI-130 4/13/07

MATERIAL ULTRASONIC TESTED FOR INTERNAL SOUNDNESS.

QUENCH TIME, TEMP, ME SPECIFICATION REPORT

TREATMENT	TEMP F	TIME (MIN.)	MEDIA
AUSTENIZE	1650	8.30	
QUENCH	0		WATER
TEMPER	1090	8.30	

REDUCTION RATIO

RATIO= 7.1 TO 1.0

CIRCOGRAPH..... SPECIFICATION 100%

CIRCOGRAPH TESTED FOR SURFACE IMPERFECTIONS

** MATERIAL 100% MELTED AND MANUFACTURED IN THE U.S.A. BY THE ELECTRIC ARC FURNACE AND CONTINUOUS CASTING METHOD. THE PRODUCT HAS NOT BEEN REPAIRED BY WELDING AND THIS MATERIAL HAS NOT BEEN EXPOSED TO MERCURY OR TO ANY OTHER METAL ALLOY THAT IS LIQUID AT AMBIENT TEMPERATURES DURING PROCESSING OR WHILE IN OUR POSSESSION. GERDAU MACSTEEL MONITORS ALL INCOMING SCRAP AND ALL HEATS OF STEEL TO ENSURE THAT PRODUCTS SHIPPED ARE FREE OF RADIOACTIVE MATERIAL.



PAGE 3 OF 3

We certify that these data are correct and in compliance with specified requirements.

Gerdau MacSteel Arkansas
5225 Planter Road
Fort Smith, AR 72902



Geary W. Ridenour

Quality Assurance Representative

DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES

Office of Structural Materials

Quality Assurance and Source Inspection



Bay Area Branch
690 Walnut Ave. St. 150
Vallejo, CA 94592-1133
(707) 649-5453
(707) 649-5493

Contract #: 04-0120F4Cty: SF/ALA Rte: 80 PM: 13.2/13.9File #: 76.15**SOURCE INSPECTION REPORT****Resident Engineer:** Siegenthaler, Peter**Address:** 333 Burma Road**City:** Oakland, CA 94607**Report No:** SIR-003390**Date Inspected:** 14-Jun-2011**Project Name:** SAS Superstructure**OSM Arrival Time:** 800**Prime Contractor:** American Bridge/Fluor Enterprises, a JV**OSM Departure Time:** 1630**Contractor:** Dyson Corp. & Subs**Location:** Painesville, OH**Quality Control Contact:** Russ Welsh**Quality Control Present:** Yes No**Material transfer:** Yes No N/A**Sampled Items:** Yes No N/A**Stock Transfer:** Yes No N/A**OK to Cut:** Yes No N/A**Rebar Test Witness:** Yes No N/A**Delayed/Cancelled:** Yes No N/A**Other:****Bridge No:** 34-0006**Component:** Main Cable Anchor Rods**Bid Item:** 66**Lot No:****Summary of Items Observed:**

On this date, Quality Assurance Inspector (QAI) Dustyn Broening was present at Dyson Corporation in Painesville, OH, as requested, to green tag release main cable PWS anchor rods from heat treat lot #OOH and #OOF to be sent to the galvanizing facility Monnig Industries Inc. for the San Francisco Oakland Bay Bridge (SFOBB) project.

This QAI met with Dyson QC Manager (QCM) Russell Welsh who accompanied this QAI to the location where main cable anchor rods were being staged for shipment.

This QAI reviewed Certificates of Compliances and Certified Material Test Reports of main cable anchor rods for a quantity of (15ea) from heat #4M76368, heat treat lot #OOH and (29ea) from heat #4M76368, heat treat lot #OOF which are to be shipped to the galvanizing facility. This QA inspector verified the rods comply with ASTM A354 Grade BD. The Dyson Lot Numbers are assigned per Heat Treatment Lot per contract document requirements. These items were not able to be green tagged due to failed test results for heat treat lot #OOF and no test results for OOH. Dyson QCM was made aware by this QAI that shipment would be at Dyson's risk. This QAI also relayed that an RFI accepting the as is condition would be required of the heat treat lot #OOF, and that acceptable test results are required for heat treat lot #OOH prior to green tagging of these items.

This QAI has received copies from the QCM of Stork Herron Testing Lab for the equipment calibration that was used, and NDT certification of the technician and reports for the MT inspection that was performed on 6/06/11.

The QCM has also provided this QAI copies of Material Test Reports of main cable anchor rods for ASTM

SOURCE INSPECTION REPORT

(Continued Page 2 of 2)

A354-07 Grade BD, Q&T, 3.5" diameter main cable PWS anchor rods from heat #3M75738, Dyson assigned heat treat lot #OPY a quantity of (104ea), and heat #4M76368, Dyson assigned heat treat lot #OTD. This QAI randomly selected (3ea) from heat treat lot #OTD and (6ea) from heat treat lot #OPY to be MT tested per ASTM F1470, Table 3 requirements. This test is to be performed on Thursday, 6/16/11.

Summary of Conversations:

As noted in the body of the report above. Other basic communication was performed between this QAI and the QCM during this visit.

Comments

This report is for the purpose of determining conformance with the contract documents and is not for the purpose of making repair or fit for purpose recommendations. Should you require recommendations concerning repairs or remedial efforts please contact Nina Choy 510-385-5910, who represents the Office of Structural Materials for your project.

Inspected By:	Broening,Dustyn	Quality Assurance Inspector
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Reviewed By:	Levell,Bill	QA Reviewer
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DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES

Office of Structural Materials

Quality Assurance and Source Inspection



Bay Area Branch
690 Walnut Ave. St. 150
Vallejo, CA 94592-1133
(707) 649-5453
(707) 649-5493

Contract #: 04-0120F4Cty: SF/ALA Rte: 80 PM: 13.2/13.9File #: 76.15**SOURCE INSPECTION REPORT****Resident Engineer:** Siegenthaler, Peter**Address:** 333 Burma Road**City:** Oakland, CA 94607**Report No:** SIR-003401**Date Inspected:** 16-Jun-2011**Project Name:** SAS Superstructure**OSM Arrival Time:** 800**Prime Contractor:** American Bridge/Fluor Enterprises, a JV**OSM Departure Time:** 1630**Contractor:** Dyson Corp. & Subs**Location:** Painesville, OH

Quality Control Contact: Russ Wesh
Material transfer: Yes No N/A
Stock Transfer: Yes No N/A
Rebar Test Witness: Yes No N/A

Quality Control Present: Yes No
Sampled Items: Yes No N/A
OK to Cut: Yes No N/A
Delayed/Cancelled: Yes No N/A

Other:**Bridge No:** 34-0006**Component:** Main Cable Anchor Rods**Bid Item:** 66**Lot No:** B337-006-11**Summary of Items Observed:**

On this date, Quality Assurance Inspector (QAI) Dustyn Broening was present at Dyson Corporation in Painesville, OH, as requested, to monitor the fabrication main cable PWS anchor rods for the San Francisco Oakland Bay Bridge (SFOBB) project.

This QAI met with Dyson QC Manager (QCM) Russell Welsh who accompanied this QAI to the location where main cable anchor rods where machining activities were in-process.

This QAI received and reviewed calibration records of Internal and Ring Go and No-Go gauges that are used for the 3.5" diameter main cable anchor rods (PWS). The 2.500-4 UNC 2B Internal Go gauge, serial #243B and Internal No-Go gauge, serial #242A calibrations are due 11/13/11. The 3.500-4 UN-2A External Ring Go gauge, serial #R356 and External Ring No-Go gauge, serial #357 calibrations are due on 12/08/11. No obvious wearing was observed on these gauges. A few accessible threaded rods from lot #OOF and #OOH were checked using these gauges and was found to be within tolerance.

This QAI performed a random visual inspection of the anchor rods and selected one anchor rod for sampling from heat #4M76368, Dyson heat treat lot #OTD. The frequency of sampling was in conformance with contract documents and included one 1200mm finished (threaded) section and two 300mm raw round stock from the selected rod.

This QA inspector reviewed the supporting documentation and verified that the anchor rod material conformed to A354 Gr. BD quench & tempered round stock. The heat number of this lot is 4M76368 and the Dyson (per heat

SOURCE INSPECTION REPORT

(Continued Page 2 of 3)

treatment) Lot Number is OTD.

The sampled coupons were placed in a cardboard box. The box was closed-up and attached to a wooden pallet with steel bands for shipment to the Caltrans translab.

A TL 101 with supporting documentation was placed into a pouch and attached to the box. This QA inspector assigned Lot No. B337-006-11 to this sample shipment.

This QAI randomly observed Stork Herron Testing Laboratories NDT manager Level III (NDT tech), Matt Novak, perform wet fluorescent MT testing on a quantity of three anchor rods from heat #4M76368, heat treat lot #OTD. Quantity of rods tested is in accordance with ASTM 1470, table 3.

MT inspection was randomly observed by this QAI to be performed by the NDT tech in accordance with ASTM E709, ASTM A490. Note that each rod that was evaluated took approximately 45 minutes to 1 hour to evaluate. Dyson QCM and NDT tech relayed to this QAI that copies of completed MT test reports will be forwarded to Dyson QCM, and that QCM will forward that information to this QAI as soon as possible.



SOURCE INSPECTION REPORT

(Continued Page 3 of 3)

Summary of Conversations:

As noted in the body of the report above. Other basic communication was performed between this QAI and the QCM during this visit.

Comments

This report is for the purpose of determining conformance with the contract documents and is not for the purpose of making repair or fit for purpose recommendations. Should you require recommendations concerning repairs or remedial efforts please contact Nina Choy 510-385-5910, who represents the Office of Structural Materials for your project.

Inspected By:	Broening,Dustyn	Quality Assurance Inspector
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Reviewed By:	Levell,Bill	QA Reviewer
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DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES

Office of Structural Materials

Quality Assurance and Source Inspection



Bay Area Branch
690 Walnut Ave. St. 150
Vallejo, CA 94592-1133
(707) 649-5453
(707) 649-5493

Contract #: 04-0120F4Cty: SF/ALA Rte: 80 PM: 13.2/13.9File #: 76.15**SOURCE INSPECTION REPORT****Resident Engineer:** Siegenthaler, Peter**Address:** 333 Burma Road**City:** Oakland, CA 94607**Report No:** SIR-003409**Date Inspected:** 21-Jun-2011**Project Name:** SAS Superstructure**OSM Arrival Time:** 800**Prime Contractor:** American Bridge/Fluor Enterprises, a JV**OSM Departure Time:** 1630**Contractor:** Dyson Corp. & Subs**Location:** Painesville, OH**Quality Control Contact:** Russ Welsh**Quality Control Present:** Yes No**Material transfer:** Yes No N/A**Sampled Items:** Yes No N/A**Stock Transfer:** Yes No N/A**OK to Cut:** Yes No N/A**Rebar Test Witness:** Yes No N/A**Delayed/Cancelled:** Yes No N/A**Other:****Bridge No:** 34-0006**Component:** Main Cable Anchor Rods**Bid Item:** 66**Lot No:** B337-007-11**Summary of Items Observed:**

On this date, Quality Assurance Inspector (QAI) Dustyn Broening was present at Dyson Corporation in Painesville, OH, as requested, to monitor the fabrication main cable PWS anchor rods for the San Francisco Oakland Bay Bridge (SFOBB) project.

This QAI met with Dyson QC Manager (QCM) Russell Welsh who accompanied this QAI to the location where main cable anchor rods where machining activities were in-process.

The QCM relayed to this QAI that the 3.5" diameter Main Cable Anchor Rod sample that was to be sent to the Trans Lab from heat #4M76368, Dyson heat treat lot #OTD and CA lot #B337-006-11 would not be sent to the lab due to previously noted discrepancies from prior samples.

This QAI received and reviewed MTR's for 7" diameter 4UNC 2A X 3.50"-4UNC 2B hex coupling nuts, ASTM A194 grade 7 which are to be sent to The Art Galvanizing Works Inc. at 3935 Valley Rd, Cleveland OH for galvanizing process. The coupling nuts heat number is K5109 and Dyson heat treat lot number OKS was assigned per Heat Treatment Lot per contract document requirements. These Coupling nuts (103ea) were green tagged and lot number B337-007-11 was assigned.

This QAI attached a Green Tag with Lot No. B337-007-11 and MTR to the material to be shipped. (Reference attached photos and this QAI's 6011 report dated 6-21-11).

The QCM relayed to this QAI that he believes that they have worked out the details to produce these rods to

SOURCE INSPECTION REPORT

(Continued Page 2 of 3)

Caltrans specification. This QAI observed QC perform random thread gauge checks using External Ring Go and No-Go gauges, Internal Go and No-Go gauges and a Pitch Micrometer on the 3.5" diameter Main Cable Anchor Rods for heat #4M76368, Dyson heat treat lot #OTD. The randomly checked threaded rods were found to be satisfactory. (See attached photos).



SOURCE INSPECTION REPORT

(Continued Page 3 of 3)



Summary of Conversations:

As noted in the body of the report above. Other basic communication was performed between this QAI and the QCM during this visit.

Comments

This report is for the purpose of determining conformance with the contract documents and is not for the purpose of making repair or fit for purpose recommendations. Should you require recommendations concerning repairs or remedial efforts please contact Nina Choy 510-385-5910, who represents the Office of Structural Materials for your project.

Inspected By: Broening,Dustyn

Quality Assurance Inspector

Reviewed By: Levell,Bill

QA Reviewer

State of California
Department of Transportation

Structural Materials Testing Laboratory
5900 Folsom Boulevard, Sacramento, CA 95819



CERTIFICATE NO. 2364.01

Remarks

ref: ASTM A354-BD, TM03. Lot #00H; Heat #4M76368 FAILS Thread Pitch Diameter - P.D. is undersize and has .020" of taper. Material Meets Strength Requirements.

Sample No: SM-11-0508
Date Sampled: 06/03/11 Date Rec'd: 06/08/11 Date Reported: 06/27/11
Lot No: B33700411 TL-101 / SIC No: C539336
Contract/Permit No: 04-0120F4
Material: 3.5"x 1200mm A354 Grade BD Main Cable Anchor Rods
Manufacturer: Dyson
Sampler: Dustyn Broening

6-27

Results: SAMPLES SUBMITTED DO NOT COMPLY WITH SPECIFICATIONS

SOURCE 59318 DISTRICT 04 E.A. 0120F3 SUB JOB SPECIAL DESIGNATION OBJECT 1270

6-8
11-0508
STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION
SAMPLE IDENTIFICATION CARD
TL-0101 (REV. 10/97)
CARD NUMBER
C539336

PRELIMINARY TESTS
 PROCESS TESTS
 ACCEPTANCE TESTS
 INDEPENDENT ASSURANCE TESTS

SAMPLE SENT TO:
 HDQTRS. LAB
 BRANCH LAB
 DIST. LAB

FIELD NO. _____
 DIST. LAB NO. _____
 LOT NO. B337-004-11
 P.O. OR REQ. NO. _____

SHIPMENT NO. _____
 AUTHORIZATION NO. _____

SPECIAL TESTS

SAMPLE OF Main Cable Anchor Rods
 FOR USE IN A354 Grade BD, QAT
 SAMPLE FROM SAS Bridge PWS Anchorage
Dyson
Painesville, Ohio

DEPTH _____
 LOCATION OF SOURCE _____

THIS SAMPLE IS SHIPPED IN _____ AND IS ONE OF _____ A GROUP OF _____
 (NO. CONTAINERS) _____
 OWNER OR MANUFACTURER _____

TOTAL QUANTITY AVAILABLE _____ TEST RESULTS DESIRED _____ DATE NEEDED _____
 NORMAL PRIORITY

REMARKS
 (2) 300mm 3.5"Ø raw stock
 (1) 1200mm 3.5"Ø threaded stock
 Heat # 4M76368 / lot # 00H

COVER ADDITIONAL INFORMATION WITH LETTER
 DATE SAMPLED 6/3/11 TITLE QA Inspector
 BY Dustyn Broening DIST. CO. RTE, FM _____

LIMITS 04-0120F4
Special Provisions

CONT. NO. _____
 FED. NO. _____
 RES. ENGR. OR SUPT. Pete Siegenthaler
 ADDRESS 333 Burma Rd
 CONTRACTOR ABF / Dyson

Lab Manager

Print

Quality Manager

MAIL TO SAME DESTINATION AS SAMPLE

.505 SAMPLES



Department of Transportation
Structural Materials Testing Laboratory
UTM: BALDWIN 60 Kip

SM Number = 11-0508

Temperature _____

Sample	Heat Number	Diameter (in)	Area (in ²)	Stress at Offset (psi)	Tensile Strength (psi)	Elongation in 4 x d (%)	Tested By
368A	4M76368	0.509	0.2035	146893	166690	15.8	FSaylor
368B	4M76368	0.51	0.2043	138989 <i>OK</i>	160430 <i>OK</i>	15.7 <i>OK</i>	FSaylor

TEST SPECIMEN PREPARATION
AND RECORD

APPROVED FOR USE BY SMTL
QUALITY MANAGER: *[Signature]*

SM No.
11-0508

Contract No.
04-0120F4

Requesting Lab Technician
Glen

Date Needed
ASAP

TL-0101 No.
C539336

E.A./Spec. Desg./Object
0400000018 3

Date Received
6-8-11

Date Tested/Provided

Machine Shop Work Requested
 standard round tension test specimen, circle one: 0.500
 standard rectangular tension test specimen, circle one: 18" long, 8" gage length
 Charpy, circle one: 10mm x 10mm x 7.5mm
 hardness measurement sample (fasteners)
 weld nugget
 chemistry slug
 other: _____
 see instructions →

Bolt Slug (3.5")
Heat # 4M76368
2 ea. 505's

Chemistry Lab type of material:
 Work Requested
 neoprene verification
 oil swell
 zinc coating weight
 steel chemistry analysis
 other: _____
 see instructions
 Other (explain)

Comments or further instructions

The received service is acceptable

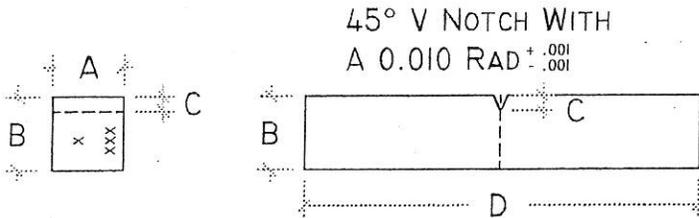
[Signature]
 Receiving Lab Technician

6/24/11
 Date

Specimen Preparation Information

SM # 11-0508
EA # _____
HEAT # 368
PREPARED BY ML
DATE 6-16-11

Charpy Impact Specimens



MATERIAL SURFACE
SPEC #

x
xxx

HEAT #

xxx

NOTCH ORIENTATION

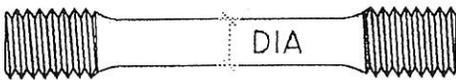
	OK
1	
2	
3	

SPC #	A	B	C	D
	NOTE #2	0.394 $\pm .001$ $-.001$	0.079 $\pm .001$ $-.001$	2.165 $\pm .000$ $-.100$
1				
2				
3				

NOTE:

- ALL MEASUREMENTS IN INCHES
- MEASUREMENT "A" 0.394, 0.295, 0.197, 0.098
TOLERANCE $\pm .001$
- SPECIMENS ARE TO BE SURFACE GROUND

Reduced Tensile Round Specimens



SPC #	DIA
A	.509
B	.510

NOTE: SPECIMEN DIA

- 0.500 $\pm .010$
 $-.010$
- 0.350 $\pm .007$
 $-.007$

Reduced Tensile Flat Specimens



SPC #	WIDTH
A	
B	

NOTE: SPECIMEN WIDTH

- 0.500 $\pm .010$

APPROVED FOR USE BY SMTL
QUALITY MANAGER
Agela B. Mantz

APPROVED FOR USE BY SMTL
QUALITY MANAGER
Angela B. Mantz

FASTENER ASSEMBLY WORKSHEET

SM Number	11-0508	Lot Number	B33700411	Date Received	6-8-11
Contract Number	04-0120F4	TL-0101 Number	C539336	Date Tested	
Lab Technician				Page	1 of 1

BOLTS:

Sample No.	1A						
Heat / Mfg. Lot No.	4M76368						
Product Markings	00H						
Size	3.5"						
Pitch Diameter	3.312/3.331 Fail - 1 end undersize $\pm .019"$ of Taper						
Bolt Length	1200mm						
Ring Gage Go/No-Go	_____						
Zinc Coating Thick.	_____						
Hardness: Rc / Rb							
Spacing							
505 Wedge Tensile							

NUTS:

Sample No.							
Mfg. Lot No.							
Product Markings							
Size							
Plug Gage Go/No-Go							
Zinc Coating Thick.							
Hardness: Rc / Rb							
Spacing							
Nut Proof Load							

WASHER:

Sample No.							
Mfg. Lot No.							
Product Markings							
Zinc Coating Thick.							
Hardness: Rc / Rb							
Spacing							



Master B/L NUMBER		DATE SHIPPED	3/23/11
B/L NUMBER	302771	LOADER	MFRF
CUSTOMER P.O.	31637	Subject to Section 7 of conditions applicable bill of lading if this shipment is to be delivered to the consignee without recourse on the consignee the consignee shall sign the following statement: The carrier shall not make delivery of this shipment without payment of freight and all other lawful charges.	
ORDER NUMBER	142993	Signature of Consignor	
CUSTOMER NUMBER	205600	Per	

This Memorandum is an acknowledgment that a Bill of Lading has been issued and is not the Original Bill of Lading nor a copy or duplicate covering the property named herein and is subordinate to the Original Bill of Lading.

RECEIVED, subject to classifications and lawfully filed tariffs in effect on the date of the receipt by the carrier of the property described in the Original Bill of Lading.

The property described below in apparent good order, except as noted in contents and condition of contents of packages (unknown), marked, consigned, and destined as indicated below, which said carrier (the work carrier being understood throughout that contact of making any person or corporation in possession of the property under the contract agrees to carry to its usual place of delivery as said destination. If on its route, otherwise to deliver to another carrier on the route to said destination. It is mutually agreed, as to each carrier of all or any portion of said property over all or any portion of said route to destination, and as to each party at any time interested in all or any of said property, that every service to be performed hereunder shall be subject to all the terms and conditions of the Uniform Domestic Straight Bill of Lading set forth (1) in Official Southern Western and Union Freight Classification Book in the effect on the date hereof, if this is a rail or rail water shipment or (2) in the applicable motor carrier classification or tariff if this is a motor carrier shipment. Shipper hereby certifies that he is familiar with all terms and conditions of the said bill of lading, including those on the back thereof, set forth in the classification or tariff which governs the transportation of this shipment, and the said terms and conditions are hereby agreed to by the shipper and to represent the terms and conditions.

SOLD TO
 TURRET STEEL IND. INC.
 105 PINE STREET

SHIP TO (CONSIGNEE TO)
 TURRET STEEL
 PICK UP AT MILL

IMPERIAL PA 15126-1142

CARRIER NAME	TRAILER/CAR NUMBER	SUPPLIER NUMBER
CPU	W0216	
ROUTING	F.O.B. POINT	FREIGHT
T FORT SMITH, AR	FORT SMITH	COLLECT
CUSTOMER SPEC.	CUSTOMER PART NUMBER	
ASTM A354-07 GRADE BD; Q&T; AIM RC 35 / 37; TSI-130 4/13/07 SEE C.T.R. COMMENTS; HUNTINGTON HT. IS AWARE OF THIS JOB		

HEAT NUMBER	GRADE	SIZE	LENGTH	UNITS	QTY/UNIT	TOTAL PIECES	WEIGHT
4M76368 DUE DATE: 3/14/11	4140	3.52000"	32'	1	5	5	5260.00LB
4M76368 DUE DATE: 3/14/11	4140	3.52000"	32'	1	6	6	6312.00LB
4M76368 DUE DATE: 3/14/11	4140	3.52000"	32'	5	6	30	31860.00LB
Bundle #: 0001694012							
Bundle #: 0001693969							
Bundle #: 0001694013				0001694014	0001694015	0001694016	
Bundle #: 0001694017							
Bundle Weight = 6372.00 LBS							
HEAT TOTALS				7		41	43432.00LB
43432.00LBS OF 109918LBS SHIPPED							

41 BARS

Code 00H

PRINTED NAME Antoine MAPSON SIGNATURE Antoine Mapson DATE 3/25/11

RLS Number	PAGE TOTALS
	B/L TOTALS 7 41 43432.00LB

GERDAU MACSTEEL Shipper, Per
 Permanent post office address of Shipper
 5225 Planter Road
 FORT SMI, AR 72902
 Agent, Per

GOODS COVERED BY THIS BILL HAVE BEEN PLACED ON TRUCK SPECIFICALLY UNDER DRIVERS INSTRUCTIONS AND LOADED TO HIS SATISFACTION THIS BILL MAY BE EXECUTED BY ELECTRONIC OR FACSIMILE SIGNATURE AND IN ANY NUMBER OF COUNTERPARTS, EACH SUCH COUNTERPART TO BE DEEMED AN ORIGINAL INSTRUMENT

CERTIFIED MATERIAL TEST REPORT **CODE 00H**

CUSTOMER ORDER NUMBER 31637	CUSTOMER PART NUMBER	HEAT NUMBER 4M76368	WORK ORDER NUMBER 142993 103	DATE 3/23/11
---------------------------------------	-----------------------------	-------------------------------	--	------------------------

REPORT TO

TURRET STEEL IND. INC.
105 PINE STREET

SHIP TO

TURRET STEEL
PICK UP AT MILL

IMPERIAL , PA 15126-1142

ORDERED

GRADE 4140	SIZE 3.52"	LENGTH 32'
----------------------	----------------------	----------------------

CUSTOMER SPECIFICATIONS
ASTM A354-07 GRADE BD; Q&T; AIM RC 35 / 37; TSI-130 4/13/07

CHEMICAL ANALYSIS

C	Mn	P	S	Si	Ni	Cr	Mo	Cu	Sn	Al
0.42	0.97	0.014	0.030	0.20	0.09	1.04	0.17	0.18	0.010	0.023
V	Cb	Ca	N2							
0.003	0.002	0.0013	0.0060							

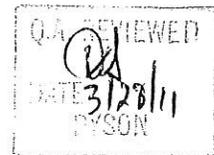
GRAIN SIZE SPECIFICATION ASTM E112 (5-8)

% OF GRAIN 5-8 AVG

M 100 7.0

HARDNESS SPECIFICATION Q&T (AIM 35-37RC)

CENTER	MID RADIUS	SURFACE	AVERAGE
32.9	35.4	38.2	35.5 HRC



We certify that these data are correct and in compliance with specified requirements.

CERTIFIED MATERIAL TEST REPORT

CODE 004

CUSTOMER ORDER NUMBER 31637	CUSTOMER PART NUMBER	HEAT NUMBER 4M76368	WORK ORDER NUMBER 142993 103	DATE 3/23/11
--------------------------------	----------------------	------------------------	---------------------------------	-----------------

REPORT TO

SHIP TO

TURRET STEEL IND. INC.
105 PINE STREET

TURRET STEEL
PICK UP AT MILL

IMPERIAL , PA 15126-1142

ORDERED

GRADE 4140	SIZE 3.52"	LENGTH 32'
---------------	---------------	---------------

CUSTOMER SPECIFICATIONS
ASTM A354-07 GRADE BD; Q&T; AIM RC 35 / 37; TSI-130 4/13/07

HARDENABILITY SPECIFICATION ASTM A304

ACTUAL

J1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	18	20	22	24	26	28	30	32	34
57	56	56	56	55	54	54	54	53	52	51	51	49	49	47	46	45	43	41	40	39	38	38	37	

MACROCLEANLINESS SPECIFICATION ASTM E381 (S3-R2-C2)

PLATE I

PLATE II

	S	R	C	
AVERAGE	1	1	1	NONE

PHYSICALS SPECIFICATION ASTM A434

02.0 IN

TENSILE (KSI)	YIELD (KSI)	% ELONGATION	REDUCTION OF AREA
150.0	130.0	16.5	48.0

DI CALCULATION SPECIFICATION REPORT

5.706

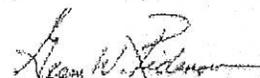
AUTO ULTRASONIC SPECIFICATION 100%

Q.A. REVIEWED
DATE 3/28/11
BY SON

PAGE 2

We certify that these data are correct and in compliance with specified requirements.

Gerdau MacSteel Arkansas
5225 Planter Road
Fort Smith, AR 72902


Geary W. Ridenour
Quality Assurance Representative

CERTIFIED MATERIAL TEST REPORT

CODE 004

CUSTOMER ORDER NUMBER 31637	CUSTOMER PART NUMBER	HEAT NUMBER 4M76368	WORK ORDER NUMBER 142993 103	DATE 3/23/11
--------------------------------	----------------------	------------------------	---------------------------------	-----------------

REPORT TO

SHIP TO

TURRET STEEL IND. INC.
105 PINE STREET

TURRET STEEL
PICK UP AT MILL

IMPERIAL , PA 15126-1142

ORDERED

GRADE 4140	SIZE 3.52"	LENGTH 32'
---------------	---------------	---------------

CUSTOMER SPECIFICATIONS
ASTM A354-07 GRADE BD; Q&T; AIM RC 35 / 37; TSI-130 4/13/07

MATERIAL ULTRASONIC TESTED FOR INTERNAL SOUNDNESS.

QUENCH TIME, TEMP, ME SPECIFICATION REPORT

TREATMENT	TEMP F	TIME(MIN.)	MEDIA
AUSTENIZE	1650	8.30	
QUENCH	0		WATER
TEMPER	1090	8.30	

REDUCTION RATIO

RATIO= 7.1 TO 1.0

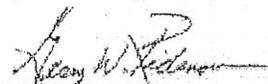
CIRCOGRAPH..... SPECIFICATION 100%

CIRCOGRAPH TESTED FOR SURFACE IMPERFECTIONS

** MATERIAL 100% MELTED AND MANUFACTURED IN THE U.S.A. BY THE ELECTRIC ARC FURNACE AND CONTINUOUS CASTING METHOD. THE PRODUCT HAS NOT BEEN REPAIRED BY WELDING AND THIS MATERIAL HAS NOT BEEN EXPOSED TO MERCURY OR TO ANY OTHER METAL ALLOY THAT IS LIQUID AT AMBIENT TEMPERATURES DURING PROCESSING OR WHILE IN OUR POSSESSION. GERDAU MACSTEEL MONITORS ALL INCOMING SCRAP AND ALL HEATS OF STEEL TO ENSURE THAT PRODUCTS SHIPPED ARE FREE OF RADIOACTIVE MATERIAL.

QA REVIEWED
DATE
DYSON

We certify that these data are correct and in compliance with specified requirements.



FORM STRAIGHT BILL OF LADING - ORIGINAL - NOT NEGOTIABLE

ISSUED, subject to the classifications and tariffs in effect on the date of the issue of this Bill of Lading.

Shipper's No. **31579**

Company Painesville, Ohio (SCAC) Date 6/3/11 From THE DYSON CORPORATION & DOMESTIC NUT DIVISION Agent's No. _____

Parties described below, in apparent good order, except as noted (contents and condition of contents of packages unknown) marked, consigned, and destined as shown below, which said carrier agrees to carry to destination, if on its route, or otherwise to deliver to another carrier on the destination. Every service to be performed hereunder shall be subject to all the conditions not prohibited by law, whether printed or written, herein contained, including the conditions on the back hereof, which are hereby agreed to by the shipper and accepted for himself and his assigns.

Consigned to Caltrans office of testing & Technology Services 5900 Folsom Blvd (Mail or Street Address of Consignee—for purposes of notification only)

Destination Sacramento State CA County 95819

Site _____ Delivery Address† _____
 (†To be filled in only when shipper desires and governing tariffs provide for delivery thereat.)

Operating Carrier Conway Car or Vehicle Initials _____ No. _____

Additional Shipment Information

No. of Packages	* HM	Kind of Package, Description of Articles, Special Marks, and Exceptions	Weight (Sub. to Cor.)	Class or Rate	Check Column	Freight charges are <u>PREPAID</u> unless marked collect. CHECK BOX IF COLLECT <input type="checkbox"/>
<u>1</u>		<u>STEEL BOLTS & NUTS I/S 104520</u>	<u>243 #</u>	<u>50</u>		FOR FREIGHT COLLECT SHIPMENTS: If this shipment is to be delivered to the consignee, without recourse on the consignor, the consignor shall sign the following statement: The carrier may decline to make delivery of this shipment without payment of freight and all other lawful charges. THE DYSON CORPORATION _____ (Signature of Consignor)
		<u>ROUGH STEEL FORGINGS 104780</u>				
		<u>STEEL BARS I/S 104340</u>				
		<u>P.O. # 660110-SA-017 CO 022</u>				
		<u>Attn: Glen Weldon</u>				
		<u>(916)-227-7251</u>				
						Collect On Delivery \$ _____ and remit to _____ C. O. D. Charge to be paid by { Shipper <input type="checkbox"/> Consignee <input type="checkbox"/>

TE (1) Where the rate is dependent on value, shippers are required to state specifically in writing the agreed or declared value of the property as follows:
 The agreed or declared value of the property is specifically stated by the shipper to be not exceeding _____ per _____."

TE (2) Liability Limitation for loss or damage on this shipment may be applicable. See 49 U.S.C. § 14706(c)(1)(A) and (B).

TE (3) Commodities requiring special or additional care or attention in handling or stowing must be so marked and packaged as to insure safe transportation with ordinary care. See Sec. 2(e) or NMFC Item 360.

Notify if problem enroute or at delivery _____ (for informational purposes only)
 Name _____ Fax No. _____ Tel. No. _____

Send freight bill to: _____
 Company Name _____ City _____ Street _____ State _____ Zip _____

Operator _____ Carrier _____
 Per _____ Per _____ Date _____

Shipper Certification: I certify that the above named materials are properly classified, aged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the DOT. Date 6/3/11

Carrier Certification: Carrier acknowledges receipt of packages and required placards. Carrier certifies emergency response information was made available and/or carrier has the DOT emergency response guidebook or equivalent document in the vehicle. Per _____ Package Nos. _____ Date _____

THE DYSON CORPORATION
 13 Freedom Rd., Painesville, OH 44077

THE DYSON CORPORATION

53 Freedom Road
Painesville, Ohio 44077
440.946.3500 / fax 440.352.2700

PACKING SLIP



PO Number 660110-SA-017 CO 022 Date 6/3/2011 Salesperson Pat Sheffield

S American Bridge / Fluor JV
O
L 375 Burma Road
D Oakland
CA 94607 USA
T
O Buyer:

S Caltrans Office of Testing & Technology Services
H Attn: Glen Weldon (916) - 227-7251
I 5900 Folsom Blvd.
P Sacramento
CA 95819 USA
T
O

Shipment No. 302110 Ship Via CONWAY Freight PPD & Allow Dyson Rep Bill of Lading 31579 Terms Net 30

Item	Description	Job No	Est. Delivery	Quantity	Shipped	Weight (lbs)
39	CALTRANS SAMPLE MATERIALS CONSISTING OF: (1) 3.50" - 4UNC 2B x 1200mm (47.25") Lg. Double End Stud w/ 300mm (11.81") of Thread, Both Ends, PLUS + (2) Pieces of 3.50" Dia. x 12.00" Lg. Blank Material (To be selected from each Heat Treat Lot for 9200mm -9700mm Rods)	L 112088	7/15/11	2 sets	3	153

Test Reports / T-NC-OMC

Order No: L 112088
 Division: Dyson
 Printed: 6/3/2011
 Received: 1/11/2011
 Promised: 7/15/2011
 Prom. Adj: 7/15/2011
 Shipped:
 Estimate No: 50877
 Estimator: Pat Sheffield
 Entered By: Pat Sheffield
 Salesperson: Pat Sheffield

DYSON INTERNAL JOB FORM

(shop copy - law 11/98)

Purchase Order No 660110-SA-017 CO 022
 Item N 39 of 4

Nom Dia Lgth: Part Type Config
 3.500 Rod Double End N/A

Sold To Address ID: AMER42.3
 American Bridge / Fluor JV

-----Thread Information-----
 Pitch Length Type Dir Form
 4 69.000 Standard RH Landis

375 Burma Road
 Oakland
 CA 94607 USA

Shank OAL Forging OAL Drawing No Coating
 31'-9.89" 31'-9.89" Plain

Ship Via Freight
 N/A N/A

Mfg From	Forge Type	Specification	Spec Gr
Bar Stk (no forging)	None	A354	BD
RAW MAT'L DATA	Extra Material	WEIGHT DATA	
Matl: Alloy	/Pc: 0.063	Cut Wgt: 1,041.1	
AISI Gr: 4140	/Bar:	Frg Wgt: 0.0	
Mult Lgth: 381.952	/Job:	Fin Wgt: 1,039.2	
		Total Wgt: 2,093.3	
Bar Dia	Shape	Surf	OAL(in) Pcs/Bar # of Bars Lot Code
3.500	Round	HR	384.000 1.01 2.00

Inventory Cost	Purch	Qty	Lot Code
	<input type="checkbox"/>		
Certifications	Std Part No		
T-NC-OMC			

Job Qty: 2
 Extra Qty: 0
 Open Qty: 2
 Job Status:

Item Description

CALTRANS SAMPLE MATERIALS CONSISTING OF:
 (1) 3.50" - 4UNC 2B x 1200mm (47.25") Lg. Double End Stud w/ 300mm (11.81") of Thread, Both Ends, PLUS +
 (2) Pieces of 3.50" Dia. x 12.00" Lg. Blank Material
 (To be selected from each Heat Treat Lot for 9200mm -9700mm Rods)

Misc Cost

MAT'L: Material on order with Turret Steel
 QC: Caltrans Inspection Required
 MFG: Saw Cut, Landis 1st End, Landis 2nd End, Send to Monnig Ind. for HDG (1 per H/T Lot)
 Saw Cut 2 Pieces 12.00" Lg. (2 per H/T Lot)
 SHIP:
 BILL:

Tot Labor Hrs: 0.6

Mfg Operation Description	S.U. Hrs	Pcs /Hr	Qty	Cost %	Comp Date	Other Vendor	Machine Name	Crew	Dept	Type
Sawcut		13.7	1	100			Lg Band Saw - man. feed	1	Cut	B
Thread 11.812 " Both Ends		4.8	1	100			Lg Landis Threader	2	Thread	B
HDG			128.50	100					Coating	

THE DYSON CORPORATION

53 Freedom Road
Painesville, Ohio 44077
440.946.3500 / fax 440.352.2700

PACKING SLIP



PO Number 660110-SA-017 CO 022

Date 6/3/2011

Salesperson Pat Sheffield

S American Bridge / Fluor JV

O
L 375 Burma Road

D Oakland
CA 94607 USA

T
O Buyer:

S Caltrans Office of Testing & Technology Services

H Attn: Glen Weldon (916) - 227-7251

I 5900 Folsom Blvd.

P Sacramento
CA 95819 USA

T
O

Shipment No.
302110

Ship Via
CONWAY

Freight
PPD & Allow

Dyson Rep

Bill of Lading
31579

Terms
Net 30

Item	Description	Job No	Est. Delivery	Quantity	Shipped	Weight (lbs)
39	CALTRANS SAMPLE MATERIALS CONSISTING OF: (1) 3.50" - 4UNC 2B x 1200mm (47.25") Lg. Double End Stud w/ 300mm (11.81") of Thread, Both Ends, PLUS + (2) Pieces of 3.50" Dia. x 12.00" Lg. Blank Material (To be selected from each Heat Treat Lot for 9200mm -9700mm Rods)	L 112088	7/15/11	2 sets	3	153

Test Reports / T-NC-OMC

DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES

Office of Structural Materials

Quality Assurance and Source Inspection



Bay Area Branch
690 Walnut Ave. St. 150
Vallejo, CA 94592-1133
(707) 649-5453
(707) 649-5493

Contract #: 04-0120F4Cty: SF/ALA Rte: 80 PM: 13.2/13.9File #: 76.15**SOURCE INSPECTION REPORT****Resident Engineer:** Siegenthaler, Peter**Address:** 333 Burma Road**City:** Oakland, CA 94607**Report No:** SIR-003439**Date Inspected:** 29-Jun-2011**Project Name:** SAS Superstructure**Prime Contractor:** American Bridge/Fluor Enterprises, a JV**Contractor:** Dyson Corp. & Subs**OSM Arrival Time:** 800**OSM Departure Time:** 1630**Location:** Painesville, OH

Quality Control Contact: Russ Welsh
Material transfer: Yes No N/A
Stock Transfer: Yes No N/A
Rebar Test Witness: Yes No N/A

Quality Control Present: Yes No
Sampled Items: Yes No N/A
OK to Cut: Yes No N/A
Delayed/Cancelled: Yes No N/A

Other:**Bridge No:** 34-0006**Bid Item:** 66**Component:** Main Cable Anchor Rods**Lot No:** B337-008-11**Summary of Items Observed:**

On this date, Quality Assurance Inspector (QAI) Dustyn Broening was present at Dyson Corporation in Painesville, OH, as requested, to monitor the fabrication main cable PWS anchor rods for the San Francisco Oakland Bay Bridge (SFOBB) project.

This QAI met with Dyson QC Manager (QCM) Russell Welsh who accompanied this QAI to the location where main cable anchor rod machining activities were in-process.

This QAI performed a random visual inspection of the anchor rods and selected one anchor rod for sampling from heat #4M76368, Dyson heat treat lot #OTD and heat #3M75738, Dyson assigned heat treat lot #OPY. The frequency of sampling was in conformance with contract documents and included two 300mm raw round stock from the selected rod. Note that the 1200mm threaded stock has not been provided at this time for lot #OTD due to pending acceptance of threaded rods for production pieces with heightened inspection. Also not provided was 1200mm threaded stock from lot #OPY, this sample is to be provided at a later date.

This QA inspector reviewed the supporting documentation and verified that the anchor rod material conformed to A354 Gr. BD quench & tempered round stock.

The sampled coupons were placed in a cardboard box. The box was closed-up and attached to a wooden pallet with steel bands for shipment to the Caltrans translab.

A TL 101 with supporting documentation was placed into a pouch and attached to the box. This QA inspector

SOURCE INSPECTION REPORT

(Continued Page 2 of 2)

assigned Lot No. B337-008-11 to this sample shipment. (See attached photos).

This QAI also accompanied ABF representative and Dyson QC representative and traveled to Bertin Steel Processing Inc. in Wickliffe, OH to confirm the capability of this facility to rough turn for roll threading of the Main Cable Anchor Rods. When we arrived at Bertin Steel Processing Inc., we met Mr. Denny Perrino, Vice President. Large diameter threading is the primary business at this location and Dyson QC personnel are to perform QC functions and monitor threading process within this facility per Dysons' Quality Control Plan.

Dyson is currently in the process of preparing Main Cable Anchor Rods to be shipped to Monnig Ind. galvanizing facility. Dyson is selecting rods from lot #OOF, OOH, OTD and OPY that have been deemed acceptable and per specification. These rods are to be shipped at Dysons' own risk per Sales Manager Pat Sheffield due to no results from Caltrans Translab for lot #OPY and OTD and failed results from OOF and OOH.



Summary of Conversations:

As noted in the body of the report above. Other basic communication was performed between this QAI and the QCM during this visit.

Comments

This report is for the purpose of determining conformance with the contract documents and is not for the purpose of making repair or fit for purpose recommendations. Should you require recommendations concerning repairs or remedial efforts please contact Nina Choy 510-385-5910, who represents the Office of Structural Materials for your project.

Inspected By:	Broening,Dustyn	Quality Assurance Inspector
Reviewed By:	Edmondson,Fred	QA Reviewer

DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES

Office of Structural Materials

Quality Assurance and Source Inspection



Bay Area Branch
690 Walnut Ave. St. 150
Vallejo, CA 94592-1133
(707) 649-5453
(707) 649-5493

Contract #: 04-0120F4Cty: SF/ALA Rte: 80 PM: 13.2/13.9File #: 76.15**SOURCE INSPECTION REPORT****Resident Engineer:** Siegenthaler, Peter**Address:** 333 Burma Road**City:** Oakland, CA 94607**Report No:** SIR-003437**Date Inspected:** 30-Jun-2011**Project Name:** SAS Superstructure**OSM Arrival Time:** 800**Prime Contractor:** American Bridge/Fluor Enterprises, a JV**OSM Departure Time:** 1630**Contractor:** Dyson Corp. & Subs**Location:** Painesville, OH**Quality Control Contact:** Russ Welsh**Quality Control Present:** Yes No**Material transfer:** Yes No N/A**Sampled Items:** Yes No N/A**Stock Transfer:** Yes No N/A**OK to Cut:** Yes No N/A**Rebar Test Witness:** Yes No N/A**Delayed/Cancelled:** Yes No N/A**Other:****Bridge No:** 34-0006**Component:** Main Cable Anchor Rods**Bid Item:** 66**Lot No:** B337-009-11**Summary of Items Observed:**

On this date, Quality Assurance Inspector (QAI) Dustyn Broening was present at Dyson Corporation in Painesville, OH, as requested, to monitor the fabrication main cable PWS anchor rods for the San Francisco Oakland Bay Bridge (SFOBB) project.

This QAI met with Dyson QC Manager (QCM) Russell Welsh who accompanied this QAI to the location where main cable anchor rod machining activities were in-process.

This QAI randomly observed QC personnel perform external threading pitch micrometer and External No-Go gauge inspection of the anchor rods to verify results and to ensure that the pitch diameter was in accordance with ASME B1.1, Table 3A for nominal size and threads/in row, 3 1/2-4 2A. This QAI observed anchor rods marked OPY2-19, OPY2-18, OPY2-17, OPY2-16, OPY2-20, OPY2-21 and OPY2-22. Of these rods, OPY2-19, OPY2-17 and OPY2-16 were found to be deficient (did not meet minimum of 3.3233" per ASME B1.1, Table 3A). These rods that were found to be deficient were set aside. Rods that were found to be acceptable are included in list below to be shipped to Monnig Ind. galvanizing facility.

Dyson has prepared (32ea) Main Cable Anchor Rods to be shipped to Monnig Ind. galvanizing facility. Dyson is selecting rods from lot #OOF, OOH, OTD and OPY that have been deemed acceptable and per specification or pending acceptance for oversized threads. These rods are to be shipped at Dysons' own risk per Sales Manager Pat Sheffield due to no results from Caltrans Translab for lot #OPY and OTD and failed results from OOF and OOH.

The main cable anchor rods that are to be shipped at Dysons' own risk are as follows:

- First bundle consists of OPY-2-23, OPY-2-22, OPY-2-24, OPY-2-18, OPY-2-20 and OPY-2-21.

SOURCE INSPECTION REPORT

(Continued Page 2 of 3)

- Second bundle consists of OPY2-9, OPY2-25, OPY2-11, OPY-2-26, OPY2-4 and OPY2-10.
- Third bundle consists of OTD-18, OTD-17, OTD-5, OTD-4 and OTD-16.
- Fourth bundle consists of OOF4-8, OOF3-4, OOF4-9, OOF5-2, OOF5-4 and OOF5-1.
- Fifth bundle consists of OPY3-7, OPY3-2, OPY3-1, OPY3-9 and OPY3-6.
- Sixth bundle consists of OOF2-1, OOH2-22, OOH2-6 and OOF-4-3.

This QAI received and reviewed MTR's for 3.5" diameter X 30' long ASTM A354 grade BD, Q&T main cable anchor rods which are to be sent to Bertin Steel Processing Inc. in Wickliffe, OH to be rough turned for roll threading. The anchor rods heat number is 3M75738 and Dyson heat treat lot number OPY was assigned per Heat Treatment Lot per contract document requirements. These main cable anchor rods (49ea) were green tagged and lot number B337-009-11 was assigned.

This QAI attached a Green Tag with Lot No. B337-009-11 and MTR to the material to be shipped. (Reference attached photos and this QAI's 6011 report dated 6-30-11).



Summary of Conversations:

As noted in the body of the report above. Other basic communication was performed between this QAI and the QCM during this visit.

SOURCE INSPECTION REPORT

(Continued Page 3 of 3)

Comments

This report is for the purpose of determining conformance with the contract documents and is not for the purpose of making repair or fit for purpose recommendations. Should you require recommendations concerning repairs or remedial efforts please contact Nina Choy 510-385-5910, who represents the Office of Structural Materials for your project.

Inspected By:	Broening,Dustyn	Quality Assurance Inspector
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Reviewed By:	Edmondson,Fred	QA Reviewer
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DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES

Office of Structural Materials

Quality Assurance and Source Inspection



Bay Area Branch
 690 Walnut Ave. St. 150
 Vallejo, CA 94592-1133
 (707) 649-5453
 (707) 649-5493

Contract #: 04-0120F4Cty: SF/ALA Rte: 80 PM: 13.2/13.9File #: 76.8**COMPONENT MATERIAL INSPECTION REPORT****Resident Engineer:** Siegenthaler, Peter**Address:** 333 Burma Road**City:** Oakland, CA 94607**Report No:** CMI-000361**Date Inspected:** 30-Jun-2011**Contractor:** Dyson Corp. & Subs**Location:** Painesville, OH**Bridge No.:** 34-0006**OSM Arrival Time:** 800**OSM Departure Time:** 1630**Component:#** Main Cable Anchor Rods

The following material has been inspected in accordance with Section 6 of the Standard Specifications at the above location. At this point in the fabrication process it appears to comply with contract plans and specifications.

To be shipped to the following vendor or locations: Bertin Steel Processing Inc. 1271 E. 289th St. Wickliffe, OH

Lot #	Bid Item #	Quantity	Material Description
B337-009-11	66	49 ea	3.5" diameter ASTM A354 Grade BD, Q&T Main Cable Anchor Rods, Lot #OPY, Heat #3M75738

Identification:**Summary of Items Observed:**

On this date, Quality Assurance Inspector (QAI) Dustyn Broening was present at Dyson Corporation in Painesville, OH, as requested, to monitor the fabrication main cable PWS anchor rods for the San Francisco Oakland Bay Bridge (SFOBB) project.

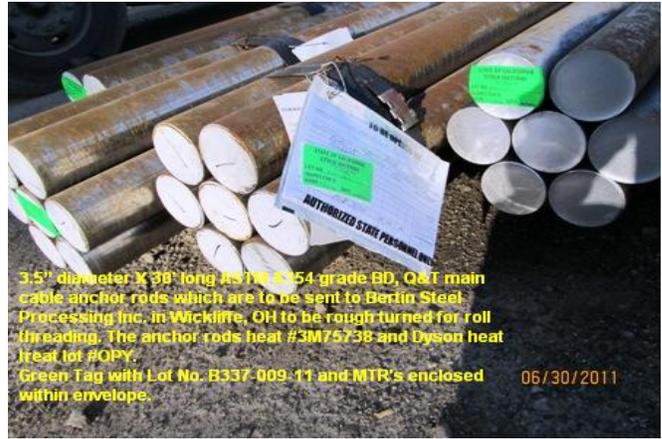
This QAI met with Dyson QC Manager (QCM) Russell Welsh who accompanied this QAI to the location where main cable anchor rods where machining activities were in-process.

This QAI received and reviewed MTR's for 3.5" diameter X 30' long ASTM A354 grade BD, Q&T main cable anchor rods which are to be sent to Bertin Steel Processing Inc. in Wickliffe, OH to be rough turned for roll threading. The anchor rods heat number is 3M75738 and Dyson heat treat lot number OPY was assigned per Heat Treatment Lot per contract document requirements. These main cable anchor rods (49ea) were green tagged and lot number B337-009-11 was assigned.

This QAI attached a Green Tag with Lot No. B337-009-11 and MTR to the material to be shipped. (Reference attached photos and this QAI's 6034 report dated 6-30-11).

COMPONENT MATERIAL INSPECTION REPORT

(Continued Page 2 of 2)



Summary of Conversations:

As noted in the body of the report above. Other basic communication was performed between this QAI and the QCM during this visit.

Comments

This report is for the purpose of determining conformance with the contract documents and is not for the purpose of making repair or fit for purpose recommendations. Should you require recommendations concerning repairs or remedial efforts please contact Nina Choy 510-385-5910, who represents the Office of Structural Materials for your project.

Inspected By: Broening, Dustyn

Quality Assurance Inspector

Reviewed By: Edmondson, Fred

QA Reviewer

DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES

Office of Structural Materials

Quality Assurance and Source Inspection



Bay Area Branch
690 Walnut Ave. St. 150
Vallejo, CA 94592-1133
(707) 649-5453
(707) 649-5493

Contract #: 04-0120F4Cty: SF/ALA Rte: 80 PM: 13.2/13.9File #: 76.15**SOURCE INSPECTION REPORT****Resident Engineer:** Siegenthaler, Peter**Address:** 333 Burma Road**City:** Oakland, CA 94607**Report No:** SIR-003449**Date Inspected:** 12-Jul-2011**Project Name:** SAS Superstructure**Prime Contractor:** American Bridge/Fluor Enterprises, a JV**Contractor:** Dyson Corp. & Subs**OSM Arrival Time:** 800**OSM Departure Time:** 1630**Location:** Painesville, OH**Quality Control Contact:** Russ Welsh**Quality Control Present:** Yes No**Material transfer:** Yes No N/A**Sampled Items:** Yes No N/A**Stock Transfer:** Yes No N/A**OK to Cut:** Yes No N/A**Rebar Test Witness:** Yes No N/A**Delayed/Cancelled:** Yes No N/A**Other:****Bridge No:** 34-0006**Component:** Main Cable Anchor Rods**Bid Item:** 66**Lot No:** B337-012-11**Summary of Items Observed:**

On this date, Quality Assurance Inspector (QAI) Dustyn Broening was present at Dyson Corporation in Painesville, OH, as requested, to monitor the fabrication main cable PWS anchor rods for the San Francisco Oakland Bay Bridge (SFOBB) project.

This QAI met with Dyson QC Manager (QCM) Russell Welsh who accompanied this QAI to the location where main cable anchor rod machining activities were in-process.

This QAI received MTR's for A354 grade BD, Q&T main cable anchor rods, heat #4M76367, Dyson heat treat lot #OQX (quantity of 106ea). This QAI randomly selected (6ea) from this lot to be MT tested per ASTM F1470, Table 3 requirements. Also selected were (6ea) from heat #3M75738, Dyson lot #OPY (104ea total within this lot) to be MT tested per ASTM F1470, Table 3 requirements. These rods selected were identified by a green spray paint mark and are to be set aside after threading has been completed and accepted by QC.

This QAI randomly observed QC personnel perform External Go Gauge and No-Go gauge inspection of the anchor rods identified as OPY3-25, OPY3-17 and OPY3-18. Of these rods OPY3-17 and OPY3-18 were found to be acceptable and OPY3-25 was deficient and was set aside for rework. Pitch Micrometer mapping of these rods still needs to be performed.

No threading operations were performed during this visit due to damage of the roll threading dies. Dyson is awaiting repairs but expects to be back in production by 7/14/11.

SOURCE INSPECTION REPORT

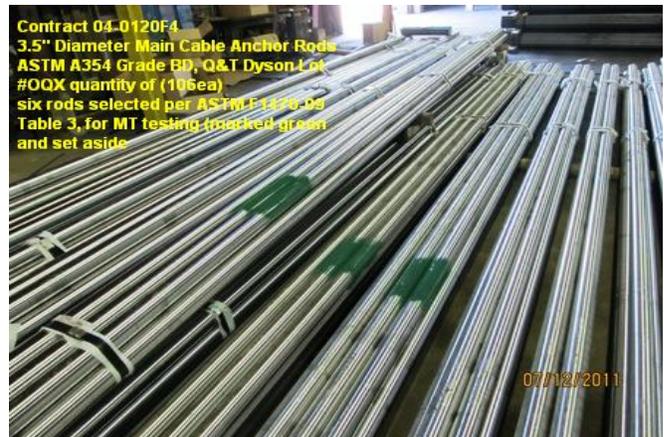
(Continued Page 2 of 3)

This QAI selected one anchor rod for sampling from heat #3M75738, Dyson assigned heat treat lot #OPY. The frequency of sampling was in conformance with contract documents and included one 1200mm threaded stock. Note that raw stock was sent on 6/29/11 from this heat and lot.

This QA inspector reviewed the supporting documentation and verified that the anchor rod material conformed to A354 Gr. BD quench & tempered round stock.

The sampled coupon was placed in a cardboard box. The box was closed-up and attached to a wooden pallet with steel bands for shipment to the Caltrans translab.

A TL 101 with supporting documentation was placed into a pouch and attached to the box. This QA inspector assigned Lot No. B337-012-11 to this sample shipment. (See attached photos).



SOURCE INSPECTION REPORT

(Continued Page 3 of 3)



Summary of Conversations:

As noted in the body of the report above. Other basic communication was performed between this QAI and the QCM during this visit.

Comments

This report is for the purpose of determining conformance with the contract documents and is not for the purpose of making repair or fit for purpose recommendations. Should you require recommendations concerning repairs or remedial efforts please contact Nina Choy 510-385-5910, who represents the Office of Structural Materials for your project.

Inspected By:	Broening,Dustyn	Quality Assurance Inspector
Reviewed By:	Edmondson,Fred	QA Reviewer

REQUEST FOR INFORMATION (RFI)

RFI No.: ABF-RFI-002502R00 Submitted By: Baltzer, Karsten Pages: 2
 RFI Date: 06-July-2011 Contact Name: Baltzer, Karsten Phone No. 510-808-4598
 Pages Attached: 1

Subject: Cable: PWS Anchor Rods	
References:	
Sub/Sup: DYS	Sub RFI #:
Response Required by: 13-July-2011	Response affects critical path activity? Yes

Description:

Please see attached proposed thread acceptance criteria in accordance with working campus discussions.

Please review and approve.

Contractor Disposition:

This RFI is being submitted for:

The Cost and Time Impact from this RFI is: Not selected

Response:

Agreed Ext. Due Date:

Pages: 2
 Pages Attached: 1

The proposal is acceptable with the following modifications, as also shown in the attached redline:

The Pitch Diameter readings must not be less than 3.323 inches, per ANSI B1.1.

Verifying the free assembly of a production nut onto each rod after galvanizing may be used as part of the acceptance criteria provided the nut and rod will be shipped and maintained as a matched pair.

Administrative Action:

This response resolves the RFI.

Date: 13-July-2011	Respondent: Brignano, Bob	Phone No.: 510-286-0503
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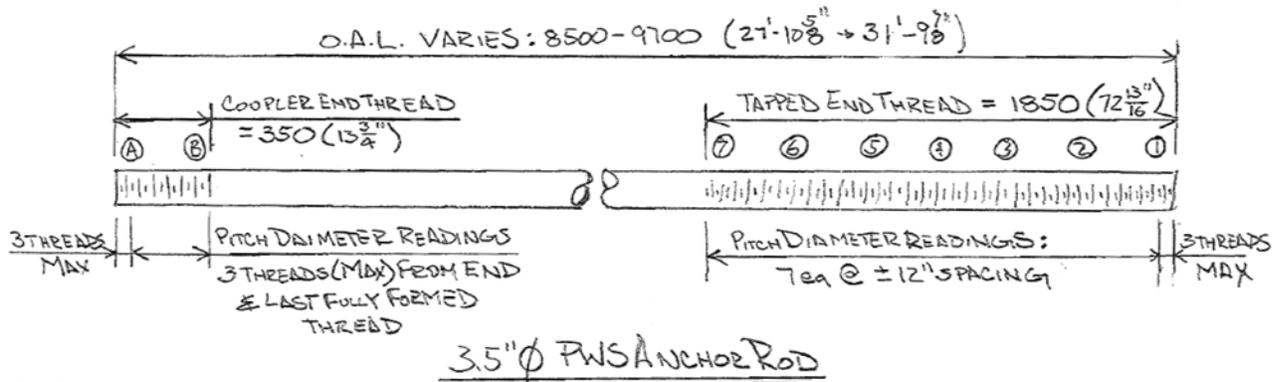
ABF-RFI-002502R00 - Caltrans Response Attachment

June 24, 2011

**SUBJECT: SUPPLY AGREEMENT NO. 660110-SA-017
3.5" Ø PWS ANCHOR ROD THREAD ACCEPTANCE CRITERIA**

After Threading the following shall be performed on the threads at BOTH ends of the PWS Anchor Rods:

1. Verify that No Go Gage will not pass further than three (3) threads onto the bar.
2. Measure the pitch diameter at the maximum engagement of the No Go Gage and every 12"± to the last fully formed thread. A total of seven (7) measurements on the "tapped" end and two (2) measurements on the "coupler" end are required. Reference the sketch below.



All Data shall be recorded in the following format:

Description		COUPLER END			TAPPED END							
		No Go	Pitch Diameter (in.)		No Go	Pitch Diameter (in.)						
Bar I.D.	Length	Pass/ Fail	A	B	Pass/ Fail	1	2	3	4	5	6	7

Provided that the No Go Gage results are acceptable and no Pitch Diameter readings are ~~found to be less~~ less than 3.323 inches than the reading taken at the maximum engagement of the No Go Gage the rods will be considered acceptable from a threading standpoint.

Go Gage readings will not be required.

After galvanizing a production nut will be threaded onto each thread and runs down, by hand, to the end of the thread to confirm that no assembly problems exist. If this can be accomplished the rods will be considered acceptable for use on the project from a threading standpoint. The nut and rod will be shipped to the site as a matched pair.

All other Caltrans QA testing will still be performed and considered to determine ultimate acceptance.

REQUEST FOR INFORMATION (RFI)

RFI No.: ABF-RFI-002513R00 Submitted By: Baltzer, Karsten Pages: 8
 RFI Date: 14-July-2011 Contact Name: Baltzer, Karsten Phone No. 510-808-4598
 Pages Attached: 7

Subject: Cable: PWS Anchor Rods - Turning at Bertin Steel Processing	
References:	
Sub/Sup: DYS	Sub RFI #:
Response Required by: 21-July-2011	Response affects critical path activity? Yes

Description:

Dyson is requesting the use of Bertin Steel Processing to convert the PWS Anchor Rod stock to PD bar. Dyson has a long standing relationship with Bertin Steel Processing. All machining will be witnessed by Dyson Quality Control department.

Bertin Steel Processing will turn the PWS Anchor Rod to a diameter from 3.332" to 3.334".

- 1) Dyson QC Approval Letter. Please see the attached letter dated 9/17/2010 for this data. Dyson have maintained Bertin on our Approved Supplier List since August 2007.
- 2) Quality Manual. Dyson was unsuccessful in obtain a copy of the current Bertin QA/QC Manual. Due to the voluminous nature of the three-part quality system manual, Bertin 's policy is to allow on-site review of the entire program. Dyson was able to obtain the documents which are attached which Bertin provided in order to demonstrate their process control and to provide an overview of the content of their quality programs.
- 3) ISO Cert. Bertin's current ISO certificate is attached.
- 4) Bertin Brochure. Bertin does not currently have a brochure to hand out and instead refer to their website for more information about their facility, capabilities, and personnel. <http://www.bertinsteel.com/>

Please review and approve.

Contractor Disposition:

This RFI is being submitted for:
 The Cost and Time Impact from this RFI is: Not selected

Response:	Agreed Ext. Due Date:
	Pages: 2
	Pages Attached: 0

Per Working Drawing Campus (WDC) discussions, it is understood that this RFI has been submitted to request an audit waiver for the Bertin Steel Processing (BSP) facility. Dyson Corporation will use the B.S.P. facility to machine the PWS Rods to a diameter suitable for machining rolled threads.

Pursuant to section 8-4 "Audits" of the Contract Special Provisions, the Department waives the MFSQA and Audit requirements for B.S.P. to machine the PWS Rods based on the details provided above, the site visit by the Engineer's representative verifying these details and the limited scope of the operation.

REQUEST FOR INFORMATION (RFI)

Administrative Action:

This response resolves the RFI.

Date: 21-July-2011	Respondent: Collins, Warren	Phone No.: 510-622-5661
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THE DYSON CORPORATION

53 Freedom Road
Painesville, OH 44077

440.946.3500

800.680.3600

Fax 440.352.2700

www.dysoncorp.com

September 17, 2010

Bertin Steel Processing, Inc
1271 E. 289th St
Wickliffe, OH 44092

Attn: William Posey

Subject: Quality Assurance Survey of your plant conducted September 15, 2010

Dear Bill,

As a result of the audit performed at your facility on this date, Bertin Steel Processing, Inc has been retained on Dyson's approved vendor list as a supplier of bar processing services for commercial, military, and nuclear applications. This approval is applicable for the following Q.A. programs: MIL-I-45208, ISO 9001, 10CFR50 Appendix B, and ASME NCA 3800. Please note that all services required of your company must be performed in-house, no subcontracting to another supplier is allowed.

Re-audit of your facilities will be triennially, unless we find that you are performing in a sub-standard fashion, at which time you will be immediately re-audited. Note that in between the interval for re-audit, Dyson will maintain performance assessments & historical data of your facilities for compliance to the applicable requirements of Dyson's purchase orders.

Where required by the Dyson purchase order, certification for work performed must include a statement substantially conforming to the following: "This material was processed in accordance with the Bertin Steel Processing, Inc. Quality Program Revision#2 dated 6/1/09"

There were no findings as a result of the audit. Thank you for your cooperation in making your facilities and records available for the audit.

Sincerely,

Steve Marsh
Quality Assurance Manager

cc: Bertin Steel Processing, Inc. Audit File

BERTIN STEEL PROCESSING, INC.

QUALITY ASSURANCE MANUAL

SECTION: QAM 001

CONTROLLED COPY

DATE: 06/01/2009

PAGE NUMBER: Page 1 of 2

REVISION NUMBER: 2

SUBJECT: TABLE OF CONTENTS

<u>ISO 9001</u> <u>REF.</u>	<u>QAM</u> <u>NUM.</u>	<u>PROCEDURE</u>	<u>REVISION</u> <u>NUM.</u>	<u>EFFECTIVE</u> <u>DATE</u>
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	003	QAM Introduction	0	08/01/2005
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4.1, 4.2.1, 4.2.2 5.4.2, 7.1	2.0	Quality System	1	05/29/2006
5.2, 7.2.1, 7.2.2 7.2.3	3.0	Contract Review	1	06/20/2006
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7.5.3	7.0	Control Customer-Supplied Product	0	08/01/2005
6.3, 6.4, 7.5.1 7.5.2	8.0	Product I.D. and Traceability	0	08/01/2005
7.1, 7.4.3, 7.5.3 8.1, 8.2.4	9.0	Process Control	0	08/01/2005
7.6	10.0	Inspection and Testing	0	08/01/2005
	11.0	Control of Inspection, Measuring and Test Equipment	0	08/01/2005
7.5.3	12.0	Inspection and Test Status	0	08/01/2005
8.3	13.0	Control of Nonconforming Product	0	08/01/2005
8.5.2, 8.5.3	14.0	Corrective and Preventive Action	0	08/01/2005
7.5.1, 7.5.5	15.0	Product Handling, Storage, Packaging, Preservation, and Delivery	0	08/01/2005
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8.2.2, 8.2.3	17.0	Internal Audits	1	07/12/2006
6.2.2	18.0	Training	1	06/12/2006
7.5.1	19.0	Servicing-See QAM 9.0 & 15.0	0	08/01/2005
8.1, 8.2.3, 8.2.4 8.4	20.0	Statistical Techniques	0	08/01/2005
Not Applicable	21.0	Customer Specific Requirements	0	08/01/2005

Approved by: James Connolly,

Q.A. Manager

BERTIN STEEL PROCESSING, INC.

QUALITY CONTROL PROCEDURE

SECTION: QCP 001

CONTROLLED COPY

DATE: 06/01/2009

PAGE NUMBER: Page 1 of 2

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8.5.1	1.2	Customer Satisfaction	2	06/01/2009
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	2.2	Continual Improvement	1	07/14/2006
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7.4.1, 7.4.2, 7.4.3	6.0	Purchasing	0	09/30/2005
7.5.4	7.0	Control of Cust. Supplied Product	1	08/19/2008
7.5.3	8.0	Product Ident. & Traceability	0	09/30/2005
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7.1, 7.4.3, 7.5.3	10.0	Inspection & Testing	0	09/30/2005
8.1, 8.2.4				
7.6	11.0	Control of Inspection, Measuring And Test Equipment	0	09/30/2005
	12.0	Blank	0	00/00/00
8.3	13.0	Control of Nonconforming Product	0	09/30/2005
8.5.2, 8.5.3	14.0	Corrective & Preventative Action	1	07/11/2006
7.5.1, 7.5.5	15.0	Handling, Storage, Packaging, Preservation & Delivery	1	10/31/2007
4.2.4	16.0	Control of Quality Records	0	09/30/2005
8.2.2, 8.2.3	17.0	Internal Quality Audits	1	07/12/2006
6.2.2	18.0	Training	2	06/01/2009
7.5.1	19.0	Servicing-See QCP 9.0, 15.0	0	09/30/2005
8.1, 8.2.3, 8.2.4, 8.4	20.0	Statistical Techniques	0	09/30/2005

Approved by: James Connolly, Q.A. Manager

BERTIN STEEL PROCESSING, INC.

STANDARD OPERATING PROCEDURES

SECTION: SOP 001

CONTROLLED COPY

DATE: 01/14/2009

PAGE NUMBER: Page 1 of 1

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9.1.10	No. 4 Hetran Bar Turner	0	09/15/2005
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Approved by: *James Connolly, Q.A. Manager*

BERTIN STEEL PROCESSING, INC.

QUALITY ASSURANCE MANUAL

SECTION: QAM 2.0

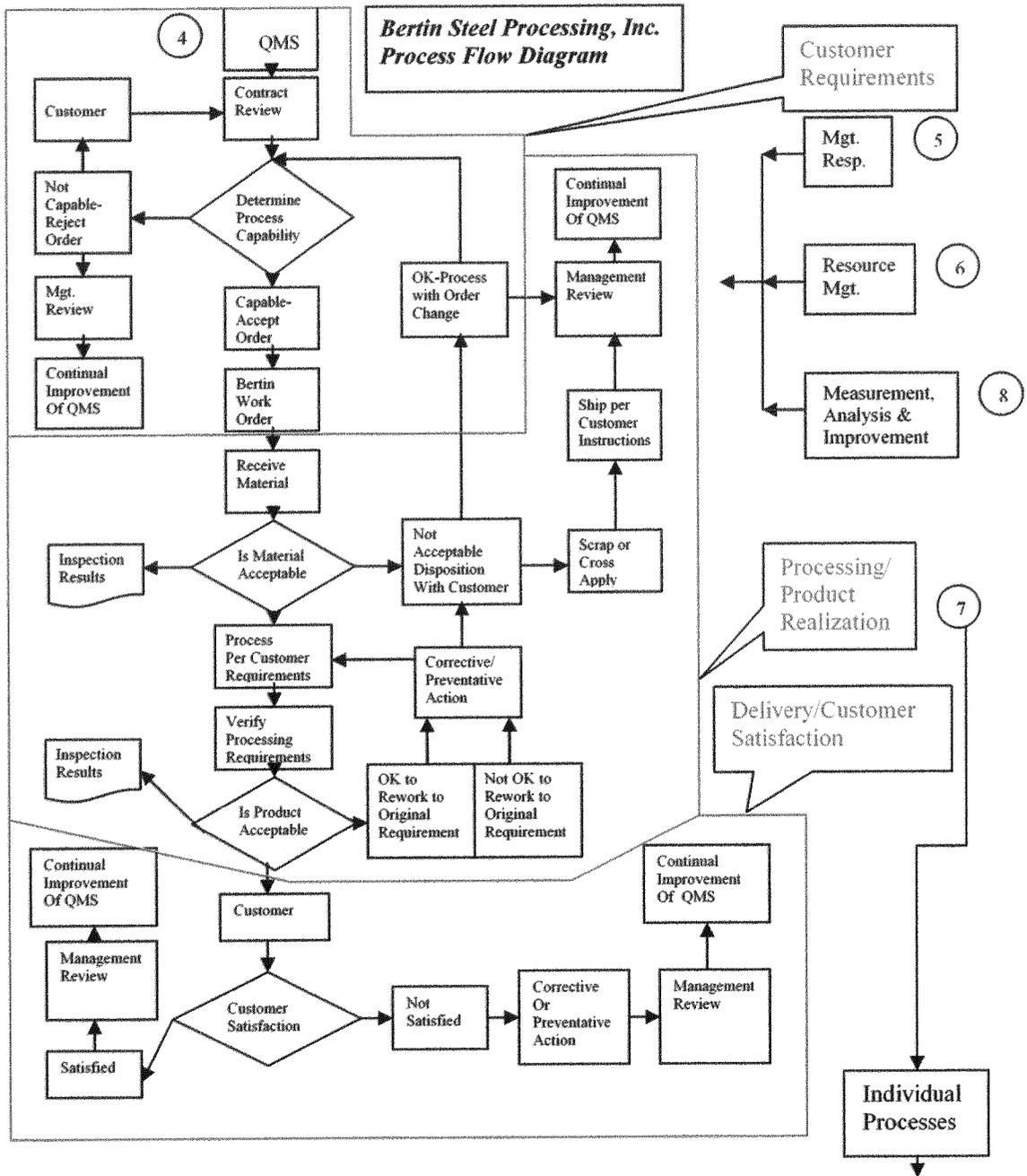
DATE: 05/29/2006

PAGE NUMBER: Page 4 of 5

REVISION NUMBER: 1

SUBJECT: QUALITY SYSTEM

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Approved by: James Connolly,

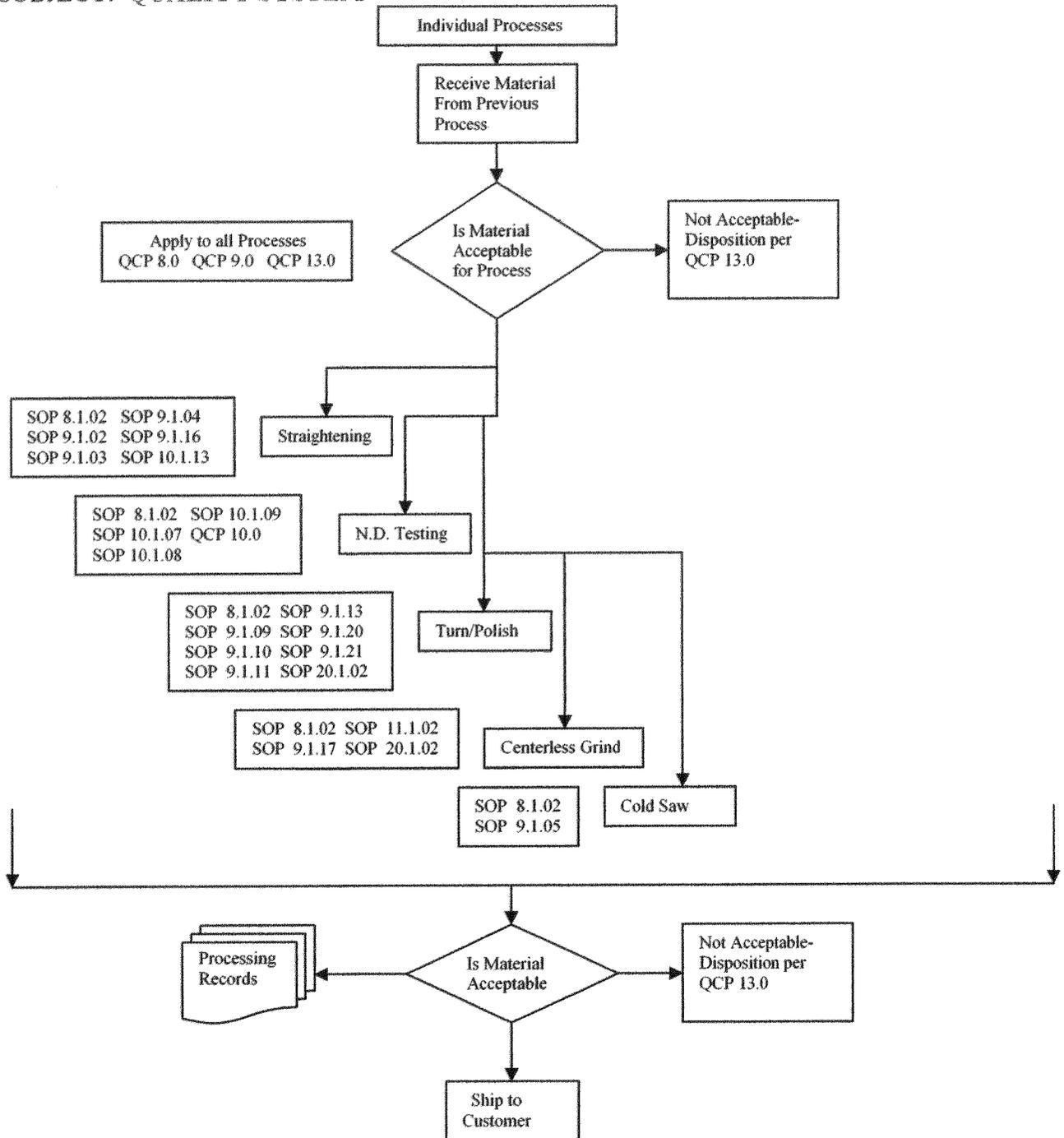
Q.A. Manager

BERTIN STEEL PROCESSING, INC.

QUALITY ASSURANCE MANUAL

SECTION: QAM 2.0
DATE: 05/29/2006
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SUBJECT: QUALITY SYSTEM

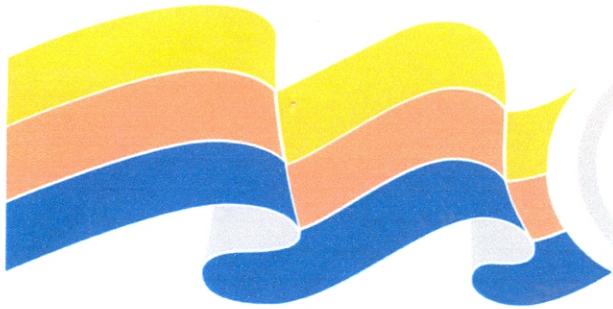
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Approved by: James Connolly,

Q.A. Manager

CERTIFICATE OF REGISTRATION



**Quality
System
Registrar**



Having been audited in accordance with requirements of

ISO 9001:2008 – ANSI/ISO/ASQ Q9001-2008

SRI Quality System Registrar, Seven Fields, Pennsylvania, USA, hereby grants to:

Bertin Steel Processing, Inc.

Registration of the management system at its location:

**1271 East 289th Street
Wickliffe, Ohio, USA**

The conditions for maintaining this certificate of registration are set forth in the SRI registration agreements R20.3 and R20.4. Further clarifications regarding the scope of this certificate and the applicability of ISO 9001:2008 requirements may be obtained by consulting the organization.

Scope of ISO 9001:2008 registration: "Processing and distribution of steel products."

Exclusions: Design and Development

Initial SRI registration date: October 3, 2006

Current registration period: October 2, 2009 through October 1, 2012

Signed for SRI:



Christopher H. Lake, President & COO

Certificate Date: October 2, 2009
Certificate Number: 008329
Registration Number: 2507-01



DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES

Office of Structural Materials

Quality Assurance and Source Inspection



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Contract #: 04-0120F4Cty: SF/ALA Rte: 80 PM: 13.2/13.9File #: 99.15**SOURCE INSPECTION REPORT****Resident Engineer:** Siegenthaler, Peter**Address:** 333 Burma Road**City:** Oakland, CA 94607**Report No:** SIR-003452**Date Inspected:** 14-Jul-2011**Project Name:** SAS Superstructure**OSM Arrival Time:** 800**Prime Contractor:** American Bridge/Fluor Enterprises, a JV**OSM Departure Time:** 1800**Contractor:** Monning Industries Inc.**Location:** Glasgow, MO**Quality Control Contact:** Ryan Monning**Quality Control Present:** Yes No**Material transfer:** Yes No N/A**Sampled Items:** Yes No N/A**Stock Transfer:** Yes No N/A**OK to Cut:** Yes No N/A**Rebar Test Witness:** Yes No N/A**Delayed/Cancelled:** Yes No N/A**Other:****Bridge No:** 34-0006**Component:** PWS High Strength Rods**Bid Item:** 66**Lot No:** N/A**Summary of Items Observed:**

This Quality Assurance (QA) Inspector, Craig Hager, was present at Monning Industries Inc. in Glasgow, MO as requested to monitor the galvanizing of Parallel Wire Strand (PWS) High Strength Rods from Dyson Corporation for use on the San Francisco / Oakland / Bay Bridge (SFOBB), Self Anchored Suspension (SAS) project.

This QA Inspector met with American Bridge/Fluor (ABF) Quality Control Manager (QCM) Chuck Kanapicki at Monning Industries to observe the galvanizing process and threading of the nuts onto the high strength rods.

This QA Inspector and QCM Chuck Kanapicki met with Monning Industries General Manager Ryan Monning and were informed that 4 of the high strength rods were staged to start the galvanizing process. Ryan Monning escorted us to the shop area and informed us the process started with an Ammonium Chloride dip. This QA Inspector and QCM Chuck Kanapicki observed the 4 rods being dipped into the Ammonium Chloride bath. The rods were then dipped, 2 at a time, into the galvanizing tank covering approximately 75% of the surface area. The rods were dipped twice into the galvanizing bath to provide full coverage. Immediately after being removed from the galvanizing tank two Monning employees were observed cleaning the excess galvanizing material from the threaded ends with a fiber bristle brush being dipped in water for cooling purposes. The rods were then set on a rack for cooling.

This QA Inspector and QCM Chuck Kanapicki were informed that 16 of the 32 rods shipped to Monning had already been galvanized and that the nuts had been threaded on each end. This QA Inspector and QCM Chuck Kanapicki observed the 16 rods setting on racks. QCM Chuck Kanapicki threaded one of the rods with a nut by hand, this QA Inspector observed the nut appeared to thread onto the rods with little effort. This QA Inspector and QCM Chuck Kanapicki also observed a Monning employee using a deep well socket attached to an air powered

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drill motor to thread the nuts. QCM Chuck Kanapicki informed Monning General Manager Ryan Monning that a Spherical Nut was to be threaded onto the long threaded end of each rod. Ryan Monning informed QCM Chuck Kanapicki that he was not aware there were different types of nuts. QCM Chuck Kanapicki requested the side of the box containing the nuts be removed, which exposed several layers of nuts. The spherical nuts were out of sight, below the plain nuts. Ryan Monning stated he would put the spherical nuts on the long threaded ends as requested. Ryan Monning asked QCM Chuck Kanapicki which way the spherical end of the nut was to be orientated; spherical end towards the shaft or away from the shaft. QCM Chuck Kanapicki stated he was not sure but that he would confirm the correct orientation of the nut.

While visually observing the rods it was noted by both this QA Inspector and QCM Chuck Kanapicki the identification stamps on the ends of the rods were not legible on the vast majority due to being filled with the galvanizing material. Ryan Monning observed this and used a hand held drill motor with a small wire brush attached to remove the galvanizing from the area to expose the marking.

This QA Inspector and QCM Chuck Kanapicki went to an adjacent building where Phoenix Blasting was performing the blasting of the rods and were informed by the person performing the blasting that the last 5 of the 32 rods were currently being blasted and would be done in approximately one hour. QCM Chuck Kanapicki asked Ryan Monning who performed the visual inspection of the blasting and was informed it was performed by Monning but the visual comparison charts were missing. Ryan Monning stated that a new SSPC comparison chart would be ordered. QCM Chuck Kanapicki informed Ryan Monning and this QA Inspector he would issue an Incident Report regarding this and asked Monning to expedite the process of obtaining the required charts.

Later this date this QA Inspector and QCM Chuck Kanapicki observed the 5 rods from the blasting area arrived at the front of the galvanizing station and a Monning employee spraying the threaded end of the rods with "Brake Parts Cleaner" according to the label on the spray cans. QCM Chuck Kanapicki informed Ryan Monning that applying Brake Parts Cleaner was not listed in the approved process procedure. Ryan Monning stated they had an email from Dyson Corporation stating it was acceptable but when requested to provide a copy of the email by QCM Chuck Kanapicki he was informed they could not due to a recent computer issue. QCM Chuck Kanapicki requested that Monning did not use the product until approval was provided. Ryan Monning stated the brake parts cleaner would not be used. At this time QCM Chuck Kanapicki also requested that processing (galvanizing) of the last 5 rods be delayed until the SSPC blast comparison charts had arrived. Ryan Monning stated no more galvanizing would be performed until the charts had arrived.

This QA Inspector asked Ryan Monning what paperwork had arrived with the rods and was informed that Andrew Monning could provide a copy of all the documents. This QA Inspector received a copy of a purchase order and an itemized list of rods. This QA Inspector observed the rods had not been Green Tag released from Dyson Corporation to Monning Industries. This QA Inspector called Structural Material Representative (SMR) Kittric Guest of this observation. SMR Kittric Guest and this QA Inspector reviewed the list and observed at least 2 of the rods appeared to have undersized threads, SMR Kittric Guest informed this QA Inspector that they should not have been shipped from Dyson for galvanizing. This QA Inspector informed QCM Chuck Kanapicki of this issue. This QA Inspector informed Andrew Monning that a Certificate Of Compliance (COC) from Dyson Corporation along with other documents such as a COC from Monning were part of the documents required prior to shipment of any parts. This QA Inspector was informed that Monning was not ready to ship any of the parts, that 32 rods only a partial shipments and that Dyson makes all the shipping arrangements and that additional rods would be

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included.

This QA Inspector and QCM Chuck Kanapicki had a conversation regarding the observations noted above and this QA Inspector was informed an Incident Report would be issue to the applicable contractor addressing the following issues and what immediate action had been taken by QCM Chuck Kanapicki. The following is a list of the issues and action taken to date.

1. A visual inspection of the blasting on 27 of the 32 rods had not been performed after blasting using the required SSPC comparison charts. QCM Chuck Kanapicki instructed Monning not to process any more material (the last 5) until the applicable charts were on site for use.
2. The use of “Brake Parts Cleaner” without approval. QCM Chuck Kanapicki instructed Monning not to use the product any more.
3. The identification of rods. QCM Chuck Kanapicki stated the use of the wire brush appeared to solve the problem and instructed Monning to use this method to allow identification of the rods.
4. The shipment of “undersized” material. QCM Chuck Kanapicki stated Dyson would be contacted and that a list of undersized/oversized and correctly threaded material would be used to sort out any material not acceptable for the project.

This QA Inspector took photos of the galvanizing process and of several of the issues observed above, please see below.

Summary of Conversations:

This QA Inspector had general conversations with QCM Chuck Kanapicki, Monning General Manager Ryan Monning and other Monning personnel. Except as described above there were no notable conversations.



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Comments

This report is for the purpose of determining conformance with the contract documents and is not for the purpose of making repair or fit for purpose recommendations. Should you require recommendations concerning repairs or remedial efforts please contact , who represents the Office of Structural Materials for your project.

Inspected By: Hager,Craig

Quality Assurance Inspector

Reviewed By: Levell,Bill

QA Reviewer