Rea, Peter

From: Ian Smith [Ian.Smith@cox.com.au]
Sent: Thursday, 4 October 2012 11:28 AM
To:
Cc: Chris Purdon; Maginness, Ron; 'gsutton@dialight.com.au'; Rajesh Valera; Mitch Halley (Mitch@affinityelectrical.com.au); Brendan Read (brendan@affinityelectrical.com.au); Rea, Peter; Don Gilson; Akbar, Ali; McNulty, Hamish
Subject: RE: ActewAGL Approval for Substation Enclosure at Manuka Oval

Thanks

Mitch, I hope this is sufficient. If the certifier wants a letter on letter head with reference tot eh drawing please contact directly.

IS.

Ian Smith - Director

COX

Cox Architecture
22 Jardine Street, Kingston ACT 2604 Australia
E: Ian.Smith@cox.com.au | T: +61 2 6239 6255 | M: +61 437 037 981 | W: coxarchitecture.com.au | Disclaimer

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From: [mailto: @actewagl.com.au]
Sent: Thursday, 4 October 2012 11:13 AM
To: Ian Smith;
Cc: Chris Purdon; Maginness, Ron; 'gsutton@dialight.com.au'; Rajesh Valera; Mitch Halley (Mitch@affinityelectrical.com.au); Brendan Read (brendan@affinityelectrical.com.au); Rea, Peter; Don Gilson; Akbar, Ali; McNulty, Hamish
Subject: ActewAGL Approval for Substation Enclosure at Manuka Oval

Ian,

ActewAGL support the construction of the substation enclosure at the Manuka Oval for the Sports Lighting project as shown in the attached drawing.

Regards,

ActewAGL Distribution Ltd

Ph: (02) | **F:** (02)

E-mail: @actewagl.com.au

ActewAGL
GPO Box 366
Canberra ACT 2601

www.actewagl.com.au

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From: Ian Smith [mailto:Ian.Smith@cox.com.au]
Sent: Thursday, 4 October 2012 10:59 AM
To: [redacted]
Cc: Chris Purdon; Maginness, Ron; 'gsutton@dialight.com.au'; Rajesh Valera; Mitch Halley (Mitch@affinityelectrical.com.au); Brendan Read (brendan@affinityelectrical.com.au); Rea, Peter; Don Gilson; Akbar, Ali; McNulty, Hamish
Subject: RE: Actew AGL Approval

Raul,

Independent of any DA process I am requesting you to provide a letter endorsing the sub arrangement and enclosure as per the attached drawing. It is apparently required for the BA process.

Could you do this for us please?

Regards,

IS.

Ian Smith - Director

COX

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Rea, Peter

From: Ian Smith [Ian.Smith@cox.com.au]
Sent: Thursday, 4 October 2012 11:47 AM
To: Mitch Halley
Cc: 'gsutton@dialight.com.au'; Rajesh Valera; Don Gilson; Maginness, Ron; McNulty, Hamish; Brendan Read; Rea, Peter
Subject: RE: Actew Drawing?

Great!

IS.

Ian Smith - Director

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2 Jardine Street, Kingston ACT 2604 Australia
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From: Mitch Halley [mailto:Mitch@affinityelectrical.com.au]
Sent: Thursday, 4 October 2012 11:45 AM
To: Ian Smith
Cc: 'gsutton@dialight.com.au'; Rajesh Valera; Don Gilson; Maginness, Ron; McNulty, Hamish; Brendan Read; Rea, Peter
Subject: RE: Actew Drawing?

Thanks Ian,

Yes I have received the drawing from Actew,

I have also spoken to our civil contractor in regards change in design for the original meeting with John Garvin.

I have been advised that my civil contractor will be able to do the work without have to change his price.

NDD will be starting the conduit on Tuesday the 9th.

Regards,

Mitch
Affinity Electrical
0423 383 272

From: Ian Smith [Ian.Smith@cox.com.au]
Sent: Thursday, 4 October 2012 10:42 AM
To: Mitch Halley
Cc: 'gsutton@dialight.com.au'; Rajesh Valera; Don Gilson; Maginness, Ron; McNulty, Hamish; Brendan Read; Rea, Peter
Subject: Actew Drawing?

Hi Mitch,

I gather at the last site meeting Don was adviced that you were awaiting a drawing from Actew on the conduit configuration for the sub. Have you received the info you need and agreed with Actew? If not would it assist if Iron took it up with John Garvin?

Please advise,

IS.

Ian Smith - Director

COX

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Rea, Peter

From: Ian Smith [Ian.Smith@cox.com.au]
Sent: Thursday, 4 October 2012 11:03 AM
To: 'gsutton@dialight.com.au'
Cc: Rajesh Valera; Mitch Halley (Mitch@affinityelectrical.com.au); Brendan Read (brendan@affinityelectrical.com.au); Tony Staten; Maginness, Ron; McNulty, Hamish; Don Gilson; Rea, Peter; cwelbourn@AbacusLighting.com
Subject: Manuka - Program
Attachments: Microsoft Project - Manuka Floodlight program Rev 2.pdf; 120903 _Construction_program_-_Rev_1.pdf; Manuka_Floodlight_critical_path_items_pdf.pdf

Dear Greg,

At Tuesday's site meeting we'll naturally want to review planned program and your progress against this. Ahead of this could I request that you provide an update on this so I can review? Tony provided the attached document to Hamish this morning, but it does not necessarily align with site works and of course requires your endorsement. A single current program which integrates Abacus tasks and site works, and indicates how this all relates to the original baseline program (Abacus and Mitch's - also attached) would be most useful. Particular attention to the following would be appreciated:

- Arrival of remaining bolt assemblies
- Cable reticulation
- Completion of pile caps to allow for sufficient curing before tower erection
- Pole shipping and arrival dates
- Sub installation and enclosure

Cheers,

IS.

Ian Smith - Director

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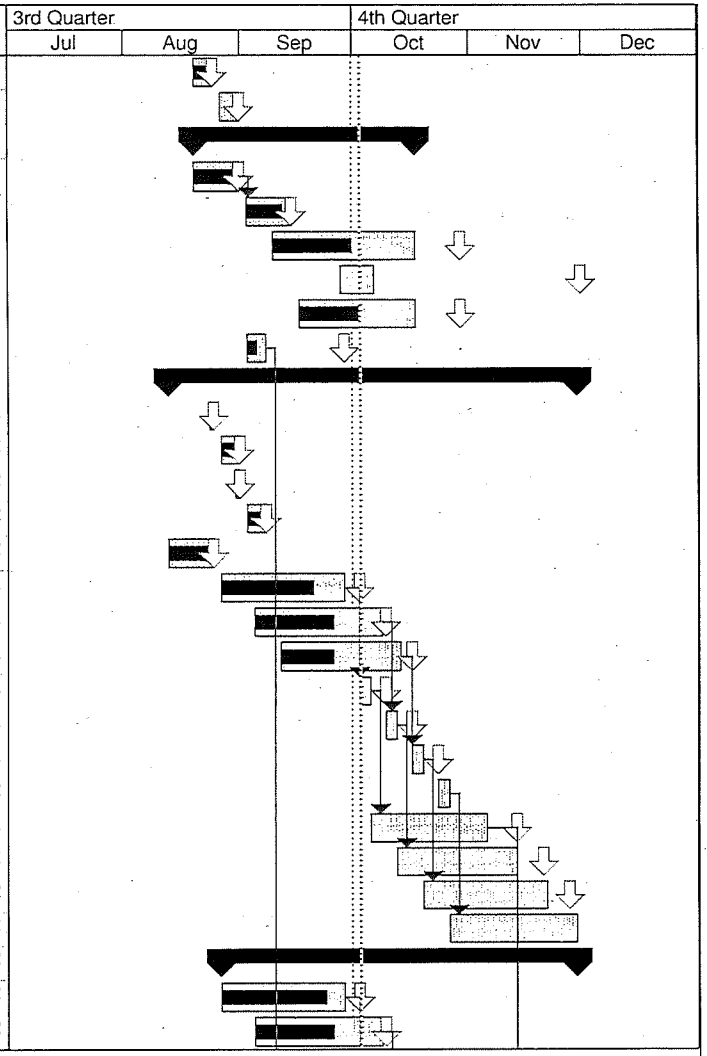
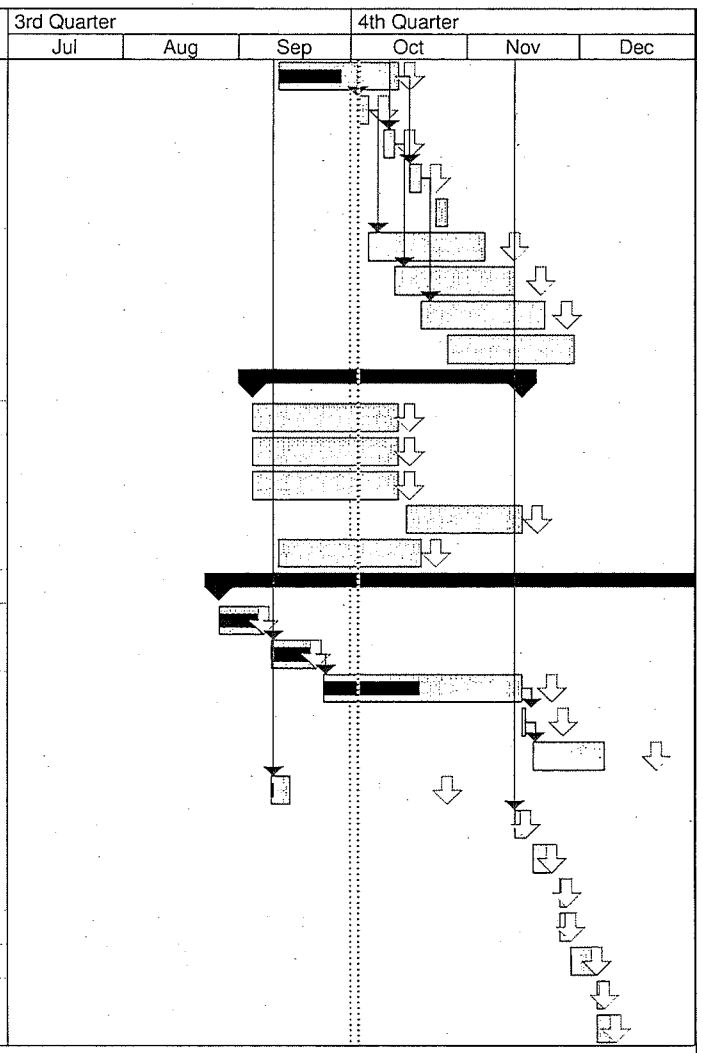
ID	Task Name	Duration	Start	Finish
1	**Survey site set out mast locations**	1 wk	Mon 20/08/12	Fri 24/08/12
2	**Site establishment**	1 wk	Mon 27/08/12	Fri 31/08/12
3	**Foundations**	**45 days**	**Mon 20/08/12**	**Wed 17/10/12**
4	Manufacture foundations bolts	2 wks	Mon 20/08/12	Fri 31/08/12
5	Deliver foundations bolts to site	2 wks	Mon 03/09/12	Fri 14/09/12
6	Construct piles & piles caps	6 wks	Mon 10/09/12	Wed 17/10/12
7	Cast pads for cabinet	7 days	Fri 28/09/12	Sat 06/10/12
8	Trenching & cable laying	5 wks	Mon 17/09/12	Wed 17/10/12
9	Construct sub-station slab	1 wk	Mon 03/09/12	Fri 07/09/12
10	**Masts**	**83 days**	**Mon 13/08/12**	**Thu 29/11/12**
11	Issue 3D model drawing	1 day	Fri 24/08/12	Fri 24/08/12
12	Cox to review and respond	1 wk	Mon 27/08/12	Fri 31/08/12
13	Issue shop drawings	1 day	Fri 31/08/12	Fri 31/08/12
14	Cox to review and respond	1 wk	Mon 03/09/12	Fri 07/09/12
15	Order steel for masts	2 wks	Mon 13/08/12	Fri 24/08/12
16	Manufacture Masts T5 & T6	5 wks	Mon 27/08/12	**Fri 28/09/12**
17	Manufacture Masts T4 & T1	5 wks	Wed 05/09/12	**Mon 08/10/12**
18	Manufacture Masts T2 & T3	5 wks	Wed 12/09/12	**Sat 13/10/12**
19	Load & despatch masts T5	3 days	Wed 03/10/12	**Fri 05/10/12**
20	Load & despatch masts T6 & T4 to port	3 days	Wed 10/10/12	**Fri 12/10/12**
21	Load & despatch masts T1 & T2 to port	3 days	Wed 17/10/12	**Fri 19/10/12**
22	Load & despatch masts T3	3 days	Wed 24/10/12	Fri 26/10/12
23	Sail & deliver masts T5 to site	5 wks	Sat 06/10/12	Mon 05/11/12
24	Sail & deliver masts T6 & T4 to site	5 wks	Sat 13/10/12	Tue 13/11/12
25	Sail & deliver masts T1 & t2 to site	5 wks	Sat 20/10/12	Wed 21/11/12
26	Sail & deliver masts T3 to site	5 wks	Sat 27/10/12	Thu 29/11/12
27	**Headframes**	**73 days**	**Mon 27/08/12**	**Thu 29/11/12**
28	Manufacture H/frames T5 & T6	5 wks	Mon 27/08/12	**Fri 28/09/12**
29	Manufacture H/frames T4 & T1	5 wks	Wed 05/09/12	**Mon 08/10/12**



Project: Manuka Tender Floodlight Prc
Date: Wed 03/10/12

Task
Split
Progress
Milestone
Summary
Rolled Up Task
Rolled Up Split
Rolled Up Milestone
Rolled Up Progress
External Tasks
Project Summary
External Milestone
Deadline

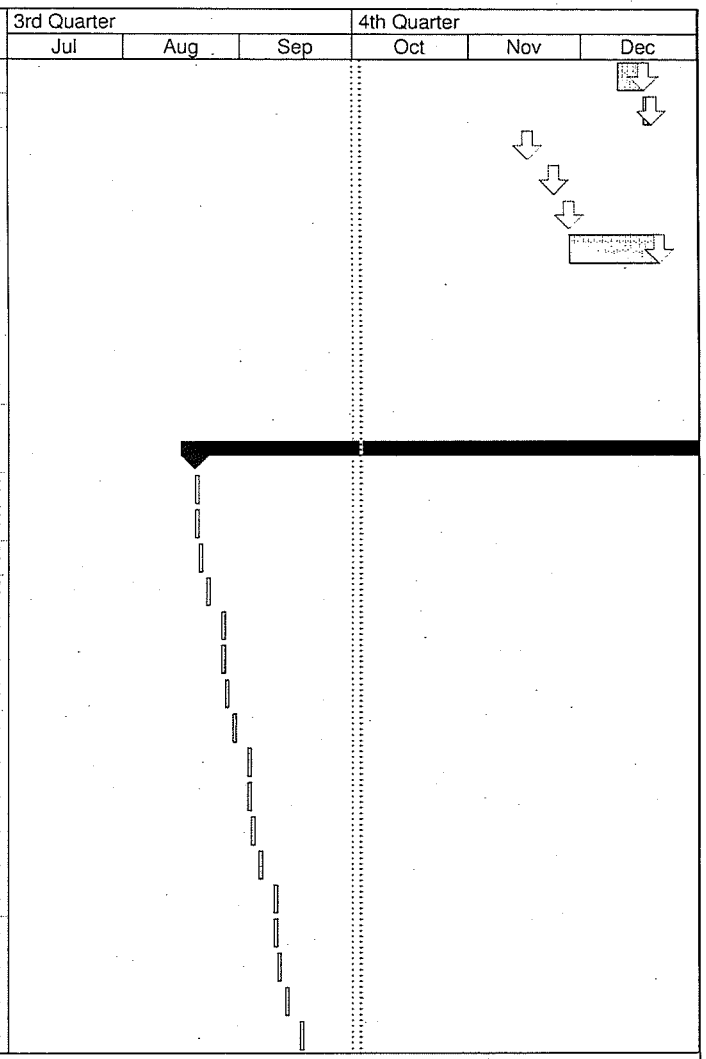
ID	Task Name	Duration	Start	Finish
30	Manufacture H/frames T2 & T3	5 wks	Wed 12/09/12	**Sat 13/10/12**
31	*Load & despatch H/frames T5 to port*	3 days	Wed 03/10/12	**Fri 05/10/12**
32	*Load & despatch H/frames T6 & T4 to port*	3 days	Wed 10/10/12	**Fri 12/10/12**
33	*Load & despatch H/frames T1 & T2 to port*	3 days	Wed 17/10/12	**Fri 19/10/12**
34	*Load & despatch H/frames T3 to port*	3 days	Wed 24/10/12	Fri 26/10/12
35	*Sail & deliver H/frames T5 to site*	5 wks	Sat 06/10/12	**Mon 05/11/12**
36	*Sail & deliver H/frames T6 & T4 to site*	5 wks	Sat 13/10/12	**Tue 13/11/12**
37	*Sail & deliver H/frames T1 & T2 to site*	5 wks	Sat 20/10/12	**Wed 21/11/12**
38	*Sail & deliver H/frames T3 to site*	5 wks	Sat 27/10/12	Thu 29/11/12
39	**Floodlights**	**56 days**	**Wed 05/09/12**	**Thu 15/11/12**
40	Manufacture 178 Nr. AL5911 Floodlights	6 wks	Wed 05/09/12	**Sat 13/10/12**
41	Manufacture 306 Nr. AL5911 Floodlights	6 wks	Wed 05/09/12	**Sat 13/10/12**
42	Manufacture 80 Nr. AL5913 Floodlights	6 wks	Wed 05/09/12	**Sat 13/10/12**
43	Deliver floodlights to site	5 wks	Tue 16/10/12	Thu 15/11/12
44	Depatch floodlight gear & lamps	6 wks	Wed 12/09/12	Fri 19/10/12
45	**Construction Australia**	**102 days**	**Mon 27/08/12**	**Thu 17/01/13**
46	Design gear and distribution cubicles	2 wks	Mon 27/08/12	Fri 07/09/12
47	Switchboard approval	2 wks	Mon 10/09/12	Fri 21/09/12
48	Manufacture switchboards	43 days	Mon 24/09/12	Thu 15/11/12
49	Deliver switchboards to site	1 day	Fri 16/11/12	Fri 16/11/12
50	Install cabinets and connect	3 wks	Mon 19/11/12	Fri 07/12/12
51	Construct sub-station	1 wk	Mon 10/09/12	Fri 14/09/12
52	*Lay out and preassemble mast T5*	3 days	Wed 14/11/12	Fri 16/11/12
53	*Assemble h/frame and fit to mast T5*	5 days	Mon 19/11/12	Fri 23/11/12
54	*Lift mast T 5*	2 days	Mon 26/11/12	Tue 27/11/12
55	*Lay out and preassemble masts T6 & T4*	3 days	Mon 26/11/12	Wed 28/11/12
56	*Assemble h/frame and fit to masts T6 & T4*	5 days	Thu 29/11/12	Wed 05/12/12
57	*Lift masts T6 & T4*	2 days	Thu 06/12/12	Fri 07/12/12
58	*Lay out and preassemble masts T1 & T2*	3 days	Thu 06/12/12	Mon 10/12/12



Project: Manuka Tender Floodlight Prc
Date: Wed 03/10/12

Task
Split
Progress
Milestone
Summary
Rolled Up Task
Rolled Up Split
Rolled Up Milestone
Rolled Up Progress
External Tasks
Project Summary
External Milestone
Deadline

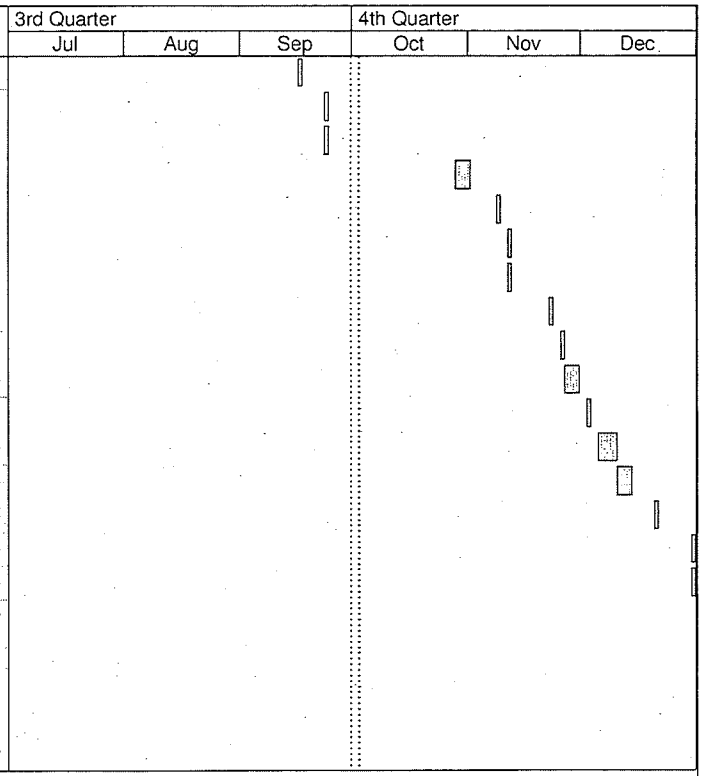
ID	Task Name	Duration	Start	Finish
59	*Assemble h/frame and fit to masts T1 & T2*	5 days	Tue 11/12/12	Mon 17/12/12
60	*Lift masts T1 & T2*	2 days	Tue 18/12/12	Wed 19/12/12
61	*Lay out and preassemble mast T3*	3 days	Wed 02/01/13	Fri 04/01/13
62	*Assemble h/frame and fit to mast T3*	4 days	Mon 07/01/13	Thu 10/01/13
63	*Lift mast T 3*	1 day	Fri 11/01/13	Fri 11/01/13
64	Connect masts to cabinets	18 days	Wed 28/11/12	Fri 21/12/12
65	Energize boards	1 day	Wed 02/01/13	Wed 02/01/13
66	Aim lights & check light levels night access	9 days	Mon 07/01/13	Thu 17/01/13
67	Inspection and testing	9 days	Mon 07/01/13	Thu 17/01/13
68	Drawings and manuals	9 days	Mon 07/01/13	Thu 17/01/13
69				
70	**Event at Manuka**	**121 days**	**Mon 20/08/12**	**Wed 06/02/13**
71	GWS v Melbourne	1 day	Mon 20/08/12	Mon 20/08/12
72	E'lake v H'Eagles	1 day	Mon 20/08/12	Mon 20/08/12
73	AFL Umpires	1 day	Tue 21/08/12	Tue 21/08/12
74	AFL Umpires	1 day	Thu 23/08/12	Thu 23/08/12
75	Bel v Tugg + 3 games	1 day	Mon 27/08/12	Mon 27/08/12
76	Eastlake v Gung + 3 games	1 day	Mon 27/08/12	Mon 27/08/12
77	AFL Umpires	1 day	Tue 28/08/12	Tue 28/08/12
78	AFL Umpires	1 day	Thu 30/08/12	Thu 30/08/12
79	Semi finals	1 day	Mon 03/09/12	Mon 03/09/12
80	Semi finals	1 day	Mon 03/09/12	Mon 03/09/12
81	AFL Umpires	1 day	Tue 04/09/12	Tue 04/09/12
82	AFL Umpires	1 day	Thu 06/09/12	Thu 06/09/12
83	Prelim finals	1 day	Mon 10/09/12	Mon 10/09/12
84	Womens G'final	1 day	Mon 10/09/12	Mon 10/09/12
85	AFL Umpires	1 day	Tue 11/09/12	Tue 11/09/12
86	AFL Umpires	1 day	Thu 13/09/12	Thu 13/09/12
87	Junior AFL finals	1 day	Mon 17/09/12	Mon 17/09/12



Project: Manuka Tender Floodlight Pr
Date: Wed 03/10/12

Task
Split
Progress
Milestone
Summary
Rolled Up Task
Rolled Up Split
Rolled Up Milestone
Rolled Up Progress
External Tasks
Project Summary
External Milestone
Deadline

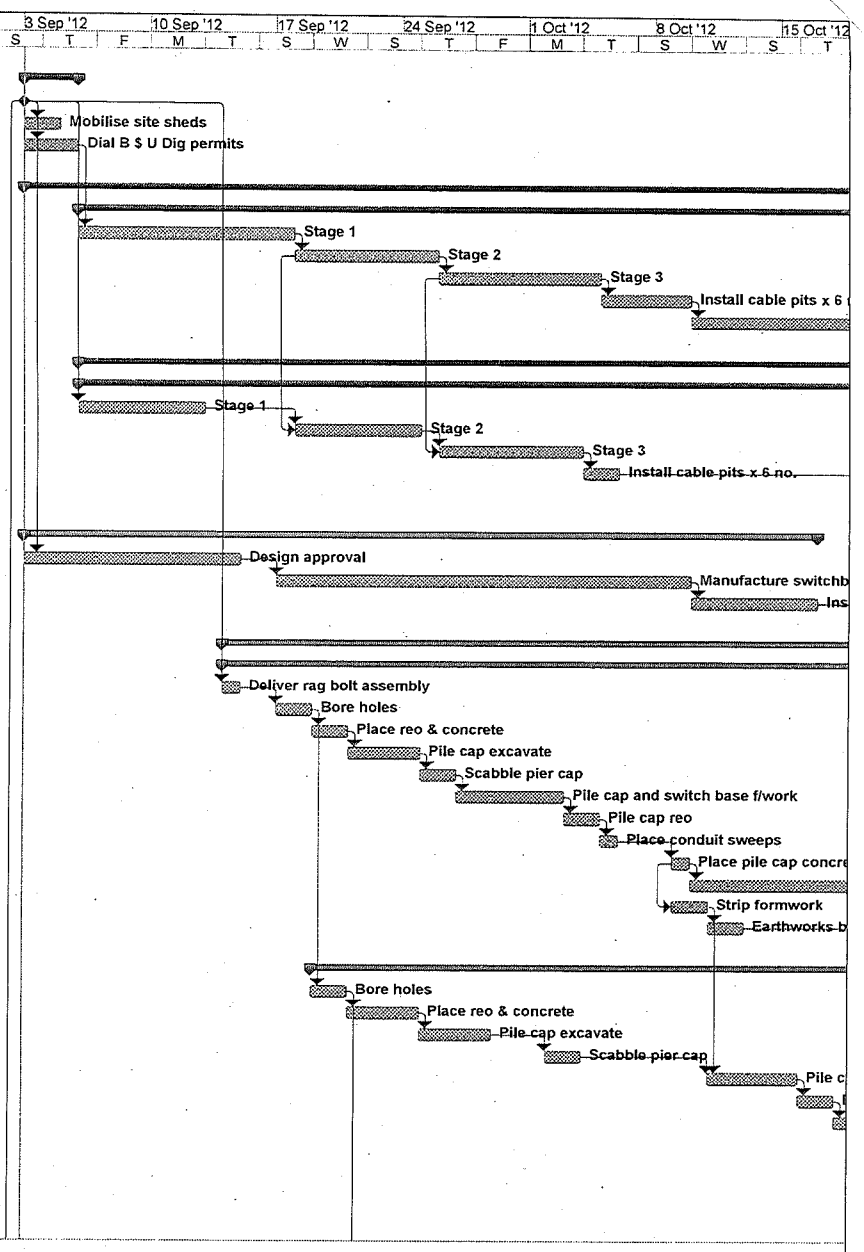
ID	Task Name	Duration	Start	Finish
88	Conference final	1 day	Mon 17/09/12	Mon 17/09/12
89	NEAFL Final (TBC)	1 day	Mon 24/09/12	Mon 24/09/12
90	NEAFL Final (TBC)	1 day	Mon 24/09/12	Mon 24/09/12
91	Comets v NSW	4 days	Mon 29/10/12	Thu 01/11/12
92	Meteors 20/20	1 day	Fri 09/11/12	Fri 09/11/12
93	Meteors 50 overs	1 day	Mon 12/11/12	Mon 12/11/12
94	Meteors 20/20	1 day	Mon 12/11/12	Mon 12/11/12
95	IDCC Finals	1 day	Fri 23/11/12	Fri 23/11/12
96	IDCC v ACA Masters	1 day	Mon 26/11/12	Mon 26/11/12
97	Sheffield Shield	4 days	Tue 27/11/12	Fri 30/11/12
98	Ryobi Cup	1 day	Mon 03/12/12	Mon 03/12/12
99	Chairmans XI	3 days	Thu 06/12/12	Mon 10/12/12
100	Comets v SA	4 days	Tue 11/12/12	Fri 14/12/12
101	Meteors 20/20	1 day	Fri 21/12/12	Fri 21/12/12
102	Meteors 50 overs	1 day	Mon 31/12/12	Mon 31/12/12
103	Meteors 20/20	1 day	Mon 31/12/12	Mon 31/12/12
104	Meteors 20/20	1 day	Fri 04/01/13	Fri 04/01/13
105	Meteors 50 overs	1 day	Mon 07/01/13	Mon 07/01/13
106	Meteors 20/20	1 day	Mon 07/01/13	Mon 07/01/13
107	PM's v W'Indies	1 day	Tue 29/01/13	Tue 29/01/13
108	ODI - AUST V W'INDIES	1 day	Wed 06/02/13	Wed 06/02/13



Project: Manuka Tender Floodlight Pr
Date: Wed 03/10/12

Task
Split
Progress
Milestone
Summary
Rolled Up Task
Rolled Up Split
Rolled Up Milestone
Rolled Up Progress
External Tasks
Project Summary
External Milestone
Deadline

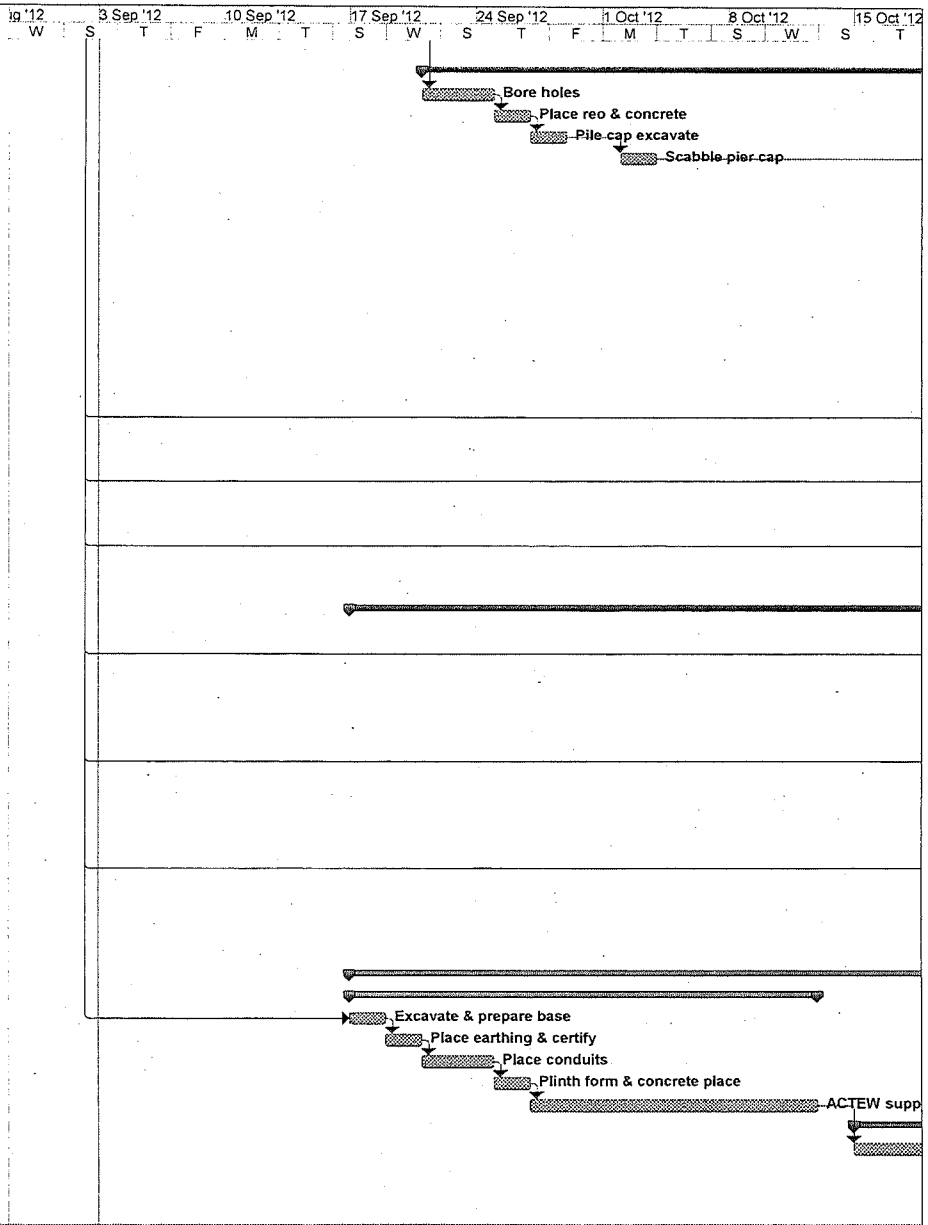
ID	Task Name	Duration	Start	Finish	Predecessors	Resource Names
1						
2	**Site establishment**	**3 days**	**Mon 3/09/12**	**Wed 5/09/12**		
3	Site possesion	0 days	Mon 3/09/12	Mon 3/09/12		
4	Mobilise site sheds	2 days	Mon 3/09/12	Tue 4/09/12	3	
5	Dial B $ U Dig permits	3 days	Mon 3/09/12	Wed 5/09/12	3	
6						
7	**Electrical conduits**	**38 days**	**Mon 3/09/12**	**Fri 26/10/12**		
8	**Directional boring & conduits installation**	**32 days**	**Thu 6/09/12**	**Tue 23/10/12**		
9	Stage 1	8 days	Thu 6/09/12	Mon 17/09/12	5	
10	Stage 2	6 days	Tue 18/09/12	Tue 25/09/12	9	
11	Stage 3	6 days	Wed 26/09/12	Thu 4/10/12	10	
12	Install cable pits x 6 no.	2 days	Fri 5/10/12	Tue 9/10/12	11	
13	Cables installation	10 days	Wed 10/10/12	Tue 23/10/12	12	
14						
15	**Communications conduits**	**35 days**	**Thu 6/09/12**	**Fri 26/10/12**		
16	**Directional boring & conduits installation**	**35 days**	**Thu 6/09/12**	**Fri 26/10/12**		
17	Stage 1	5 days	Thu 6/09/12	Wed 12/09/12	3	
18	Stage 2	5 days	Tue 18/09/12	Mon 24/09/12	17,10SS	
19	Stage 3	5 days	Wed 26/09/12	Wed 3/10/12	18,11SS	
20	Install cable pits x 6 no.	2 days	Thu 4/10/12	Fri 5/10/12	19	
21	Cables installation	3 days	Wed 24/10/12	Fri 26/10/12	20,13	
22						
23	**Switchboards**	**30 days**	**Mon 3/09/12**	**Tue 16/10/12**		
24	Design approval	10 days	Mon 3/09/12	Fri 14/09/12	3	
25	Manufacture switchboads & deliver	15 days	Mon 17/09/12	Tue 9/10/12	24	
26	Install switchboards temporarily & remove - 36 no.	5 days	Wed 10/10/12	Tue 16/10/12	25	
27						
28	**Foundations**	**54 days**	**Fri 14/09/12**	**Fri 30/11/12**		
29	**Towers 1 & 2**	**36 days**	**Fri 14/09/12**	**Tue 6/11/12**		
30	Deliver rag bolt assembly	1 day	Fri 14/09/12	Fri 14/09/12	3	
31	Bore holes	2 days	Mon 17/09/12	Tue 18/09/12	30	
32	Place reo & concrete	2 days	Wed 19/09/12	Thu 20/09/12	31	
33	Pile cap excavate	2 days	Fri 21/09/12	Mon 24/09/12	32	
34	Scabble pier cap	2 days	Tue 25/09/12	Wed 26/09/12	33	
35	Pile cap and switch base f/work	3 days	Thu 27/09/12	Tue 2/10/12	34	
36	Pile cap reo	2 days	Wed 3/10/12	Thu 4/10/12	35	
37	Place conduit sweeps	1 day	Fri 5/10/12	Fri 5/10/12	36	
38	Place pile cap concrete & switchboard base	1 day	Tue 9/10/12	Tue 9/10/12	37	
39	Concrete cure	20 days	Wed 10/10/12	Tue 6/11/12	38	
40	Strip formwork	2 days	Tue 9/10/12	Wed 10/10/12	38SS	
41	Earthworks backfill	2 days	Thu 11/10/12	Fri 12/10/12	40	
42						
43	**Towers 3 & 4**	**42 days**	**Wed 19/09/12**	**Mon 19/11/12**		
44	Bore holes	2 days	Wed 19/09/12	Thu 20/09/12	31	
45	Place reo & concrete	2 days	Fri 21/09/12	Mon 24/09/12	44	
46	Pile cap excavate	4 days	Tue 25/09/12	Fri 28/09/12	45	
47	Scabble pier cap	2 days	Tue 2/10/12	Wed 3/10/12	46	
48	Pile cap and switch base f/work	3 days	Thu 11/10/12	Mon 15/10/12	47,40	
49	Pile cap reo	2 days	Tue 16/10/12	Wed 17/10/12	48	
50	Place conduit sweeps	1 day	Thu 18/10/12	Thu 18/10/12	49	
51	Place pile cap concrete & switchboard base	1 day	Fri 19/10/12	Fri 19/10/12	50	
52	Place pile cap concrete	1 day	Mon 22/10/12	Mon 22/10/12	51	
53	Concrete cure	20 days	Tue 23/10/12	Mon 19/11/12	52	
54	Strip formwork	2 days	Mon 22/10/12	Tue 23/10/12	52SS	
55	Earthworks backfill	2 days	Wed 24/10/12	Thu 25/10/12	54,41	



Project: 120903 Construction program
Date: Mon 3/09/12

Task	Rolled Up Critical Task	Project Summary	Inactive Summary	Start-only	
Critical Task	Rolled Up Milestone	Group By Summary	Manual Task	Finish-only	
Milestone	Rolled Up Progress	Inactive Task	Duration-only	Progress	
Summary	Split	Inactive Task	Manual Summary Rollup	Deadline	
Rolled Up Task	External Tasks	Inactive Milestone	Manual Summary		

ID	Task Name	Duration	Start	Finish	Predecessors	Resource Names
56						
57	**Towers 5 & 6**	**49 days**	**Fri 21/09/12**	**Fri 30/11/12**		
58	Bore holes	2 days	Fri 21/09/12	Mon 24/09/12	44	
59	Place reo & concrete	2 days	Tue 25/09/12	Wed 26/09/12	58	
60	Pile cap excavate	2 days	Thu 27/09/12	Fri 28/09/12	59	
61	Scabble pier cap	2 days	Tue 2/10/12	Wed 3/10/12	60	
62	Pile cap and switch base f/work	3 days	Wed 24/10/12	Fri 26/10/12	61,54	
63	Pile cap reo	2 days	Mon 29/10/12	Tue 30/10/12	62	
64	Place conduit sweeps	1 day	Wed 31/10/12	Wed 31/10/12	63	
65	Place pile cap concrete & switchboard base	1 day	Thu 1/11/12	Thu 1/11/12	64	
66	Place pile cap concrete	1 day	Fri 2/11/12	Fri 2/11/12	65	
67	Concrete cure	20 days	Mon 5/11/12	Fri 30/11/12	66	
68	Strip formwork	2 days	Fri 2/11/12	Mon 5/11/12	66SS	
69	Earthworks backfill	2 days	Tue 6/11/12	Wed 7/11/12	68,55	
70						
71	**Headframes**	**18 days**	**Wed 14/11/12**	**Fri 7/12/12**		
72	**Headframes 1& 2**	**6 days**	**Wed 14/11/12**	**Wed 21/11/12**		
73	Deliver to site	1 day	Wed 14/11/12	Wed 14/11/12	3SS+50 days	
74	Assemble	5 days	Thu 15/11/12	Wed 21/11/12	73	
75	**Headframes 3 & 4**	**6 days**	**Fri 23/11/12**	**Fri 30/11/12**		
76	Deliver to site	1 day	Fri 23/11/12	Fri 23/11/12	73,3SS+57 days	
77	Assemble	5 days	Mon 26/11/12	Fri 30/11/12	76,74	
78	**Headframes 5 & 6**	**7 days**	**Thu 29/11/12**	**Fri 7/12/12**		
79	Deliver to site	1 day	Thu 29/11/12	Thu 29/11/12	3SS+61 days,73	
80	Assemble	5 days	Mon 3/12/12	Fri 7/12/12	79,77	
81						
82	**Masts**	**65 days**	**Mon 17/09/12**	**Tue 18/12/12**		
83	**Masts 1 & 2**	**13 days**	**Wed 14/11/12**	**Fri 30/11/12**		
84	Deliver to site	1 day	Wed 14/11/12	Wed 14/11/12	3SS+50 days,26	
85	Assemble	3 days	Thu 15/11/12	Mon 19/11/12	84	
86	Lift mast	2 days	Thu 22/11/12	Fri 23/11/12	74,85,39	
87	Switchboards install & fit-off	5 days	Mon 26/11/12	Fri 30/11/12	86,21	
88	**Masts 3 & 4**	**11 days**	**Fri 23/11/12**	**Fri 7/12/12**		
89	Deliver to site	1 day	Fri 23/11/12	Fri 23/11/12	3SS+57 days,26	
90	Assemble	3 days	Mon 26/11/12	Wed 28/11/12	89,85	
91	Lift mast	2 days	Thu 29/11/12	Fri 30/11/12	90,53	
92	Switchboards install & fit-off	5 days	Mon 3/12/12	Fri 7/12/12	91,87	
93	**Masts 5 & 6**	**14 days**	**Thu 29/11/12**	**Tue 18/12/12**		
94	Deliver to site	1 day	Thu 29/11/12	Thu 29/11/12	89,3SS+61 days	
95	Assemble	3 days	Fri 30/11/12	Tue 4/12/12	94,90	
96	Lift mast	2 days	Mon 10/12/12	Tue 11/12/12	95,80,67	
97	Switchboards install & fit-off	5 days	Wed 12/12/12	Tue 18/12/12	96,92	
98						
99	**Substation enclosure**	**35 days**	**Mon 17/09/12**	**Tue 6/11/12**		
100	**Transformers & plinths**	**18 days**	**Mon 17/09/12**	**Fri 12/10/12**		
101	Excavate & prepare base	2 days	Mon 17/09/12	Tue 18/09/12	3SS+10 days	
102	Place earthing & certify	2 days	Wed 19/09/12	Thu 20/09/12	101	
103	Place conduits	2 days	Fri 21/09/12	Mon 24/09/12	102	
104	Plinth form & concrete place	2 days	Tue 25/09/12	Wed 26/09/12	103	
105	ACTEW supply & place cabinet x 2 no.	10 days	Thu 27/09/12	Fri 12/10/12	104	
106	**Enclosure Blockwalling**	**17 days**	**Mon 15/10/12**	**Tue 6/11/12**		
107	Footings & switchboard slab	5 days	Mon 15/10/12	Fri 19/10/12	105	
108	Place switchboard	2 days	Mon 22/10/12	Tue 23/10/12	107	
109	Blockwork	5 days	Wed 24/10/12	Tue 30/10/12	108	
110	Fencing	5 days	Wed 31/10/12	Tue 6/11/12	109	

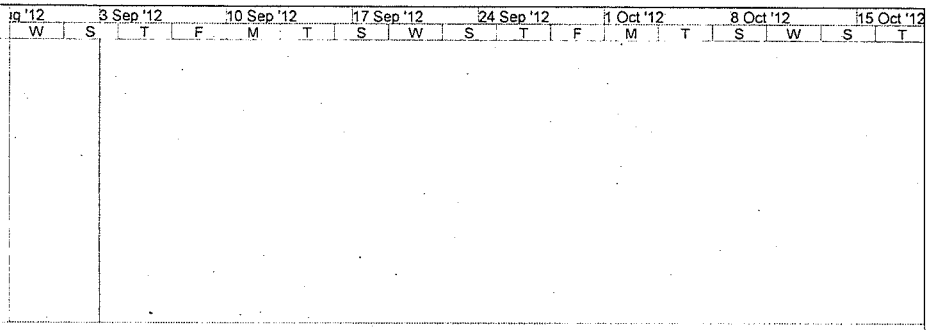


Project: 120903 Construction program
Date: Mon 3/09/12

Task	Rolled Up Critical Task	Project Summary	Inactive Summary
Critical Task	Rolled Up Milestone	Group By Summary	Manual Task
Milestone	Rolled Up Progress	Inactive Task	Duration-only
Summary	Split	Inactive Task	Manual Summary Rollup
Rolled Up Task	External Tasks	Inactive Milestone	Manual Summary

Start-only	
Finish-only	
Progress	
Deadline	

ID	Task Name	Duration	Start	Finish	Predecessors	Resource Names
111						
112	**Reinstatement works**	**10 days**	**Wed 19/12/12**	**Wed 9/01/13**		
113	Repair asphalt and concrete surfaces	5 days	Wed 19/12/12	Wed 2/01/13	109,97,110	
114	Landscape works	5 days	Thu 3/01/13	Wed 9/01/13	113,69	
115						
116	**Testing & commissioning**	**19 days**	**Wed 19/12/12**	**Tue 22/01/13**		
117	ACTPLA certification	5 days	Wed 19/12/12	Wed 2/01/13	97	
118	Energise lights	2 days	Tue 8/01/13	Wed 9/01/13	117FS+3 days	
119	Aim lights & check light intensities	9 days	Thu 10/01/13	Tue 22/01/13	118	
120						
121	**Completion**	**1 day**	**Wed 23/01/13**	**Wed 23/01/13**		
122	Final inspections	1 day	Wed 23/01/13	Wed 23/01/13	119	
123	Practical completion	0 days	Wed 23/01/13	Wed 23/01/13	122,114	



Project: 120903 Construction program
Date: Mon 3/09/12

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Critical Task	Rolled Up Milestone	Group By Summary	Manual Task	Finish-only	
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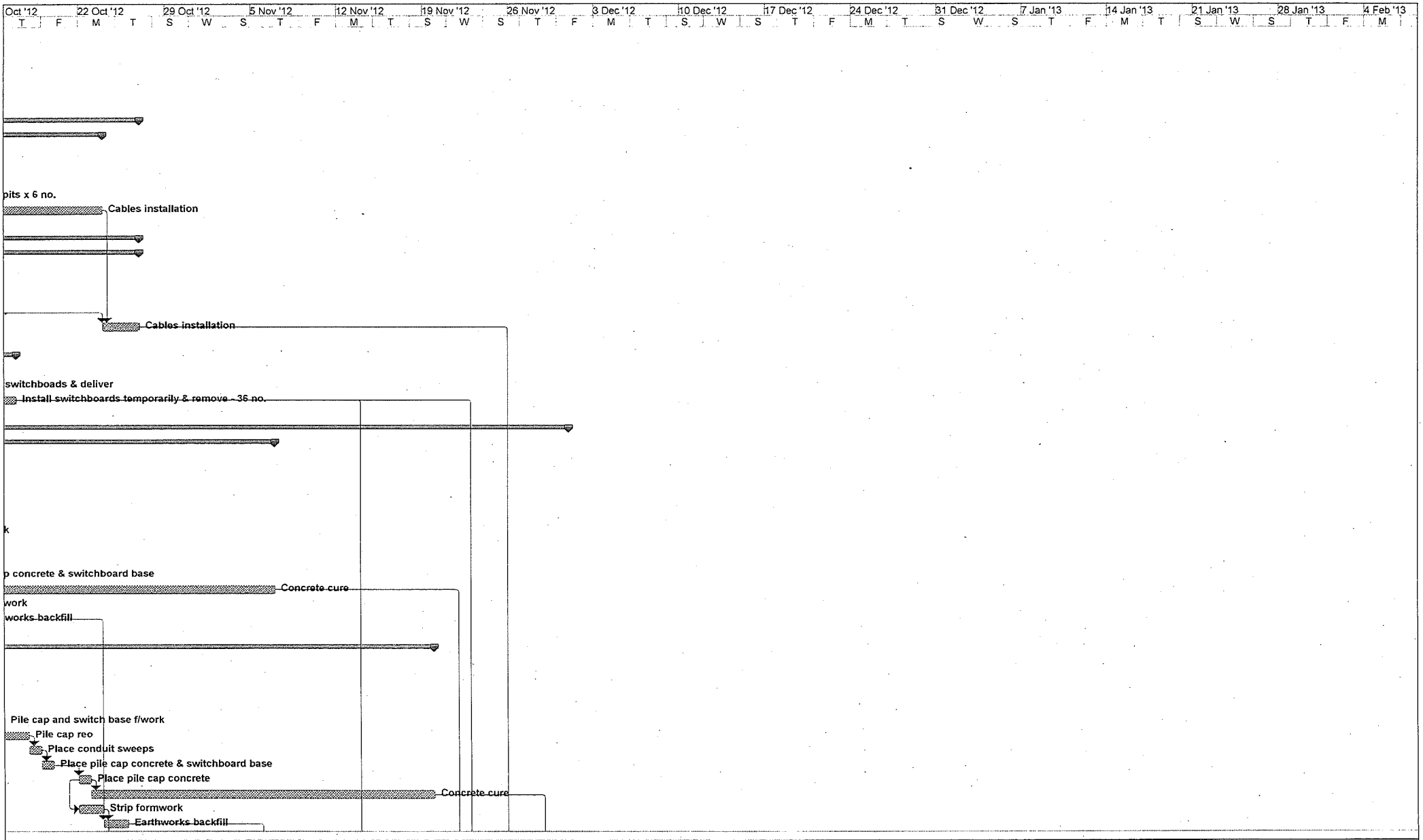
Rolled Up Task	External Tasks	Inactive Milestone	Manual Summary		



Project: 120903 Construction program
Date: Mon 3/09/12

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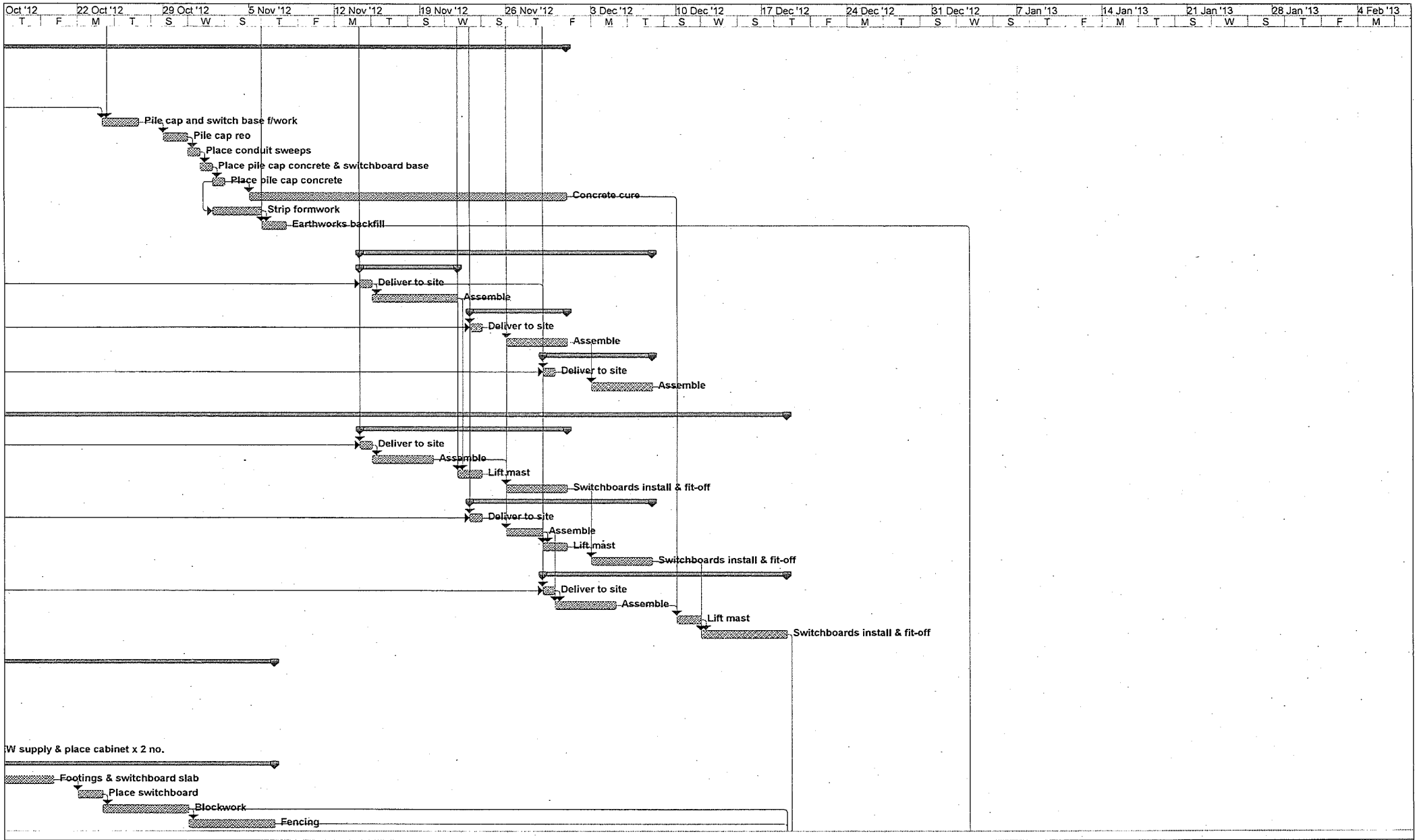

Project: 120903 Construction program
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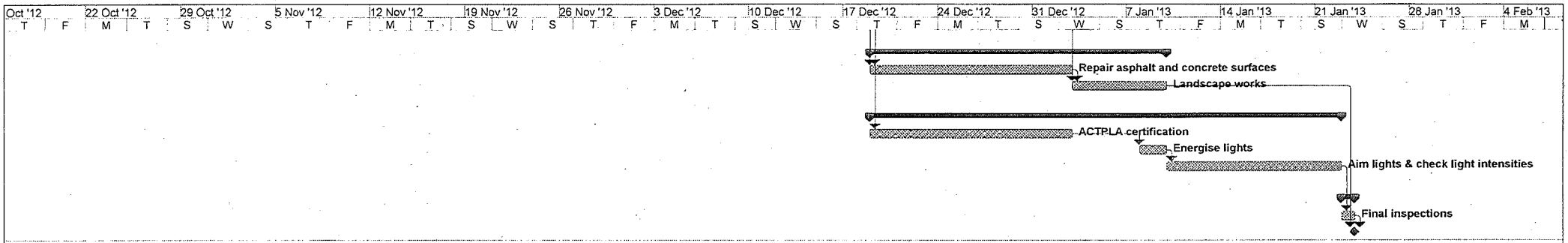
Rolled Up Task	External Tasks	Inactive Milestone	Manual Summary	



Project: 120903 Construction program
Date: Mon 3/09/12

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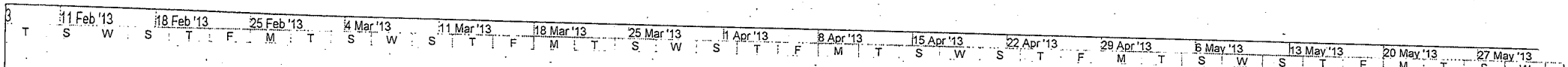

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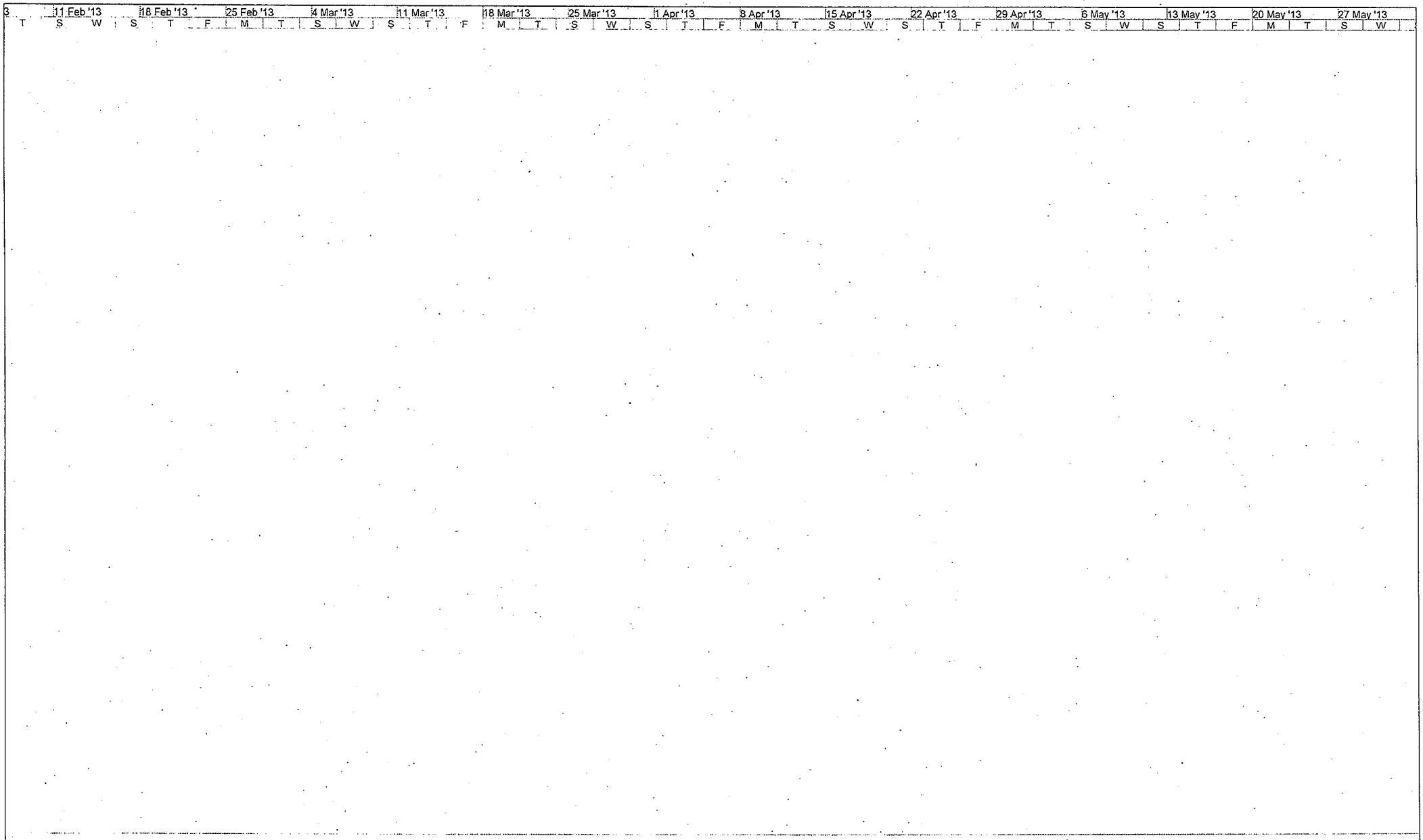

Project: 120903 Construction program
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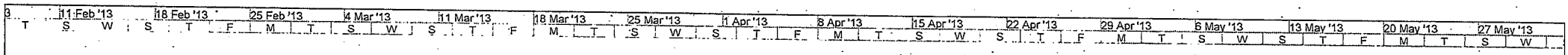

Project: 120903 Construction program
Date: Mon 3/09/12

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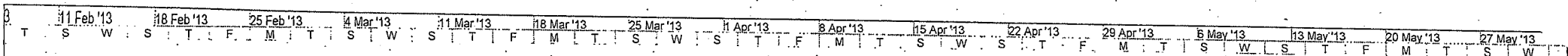

Project: 120903 Construction program
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Task	Rolled Up Critical Task	Project Summary	Inactive Summary	Start-only
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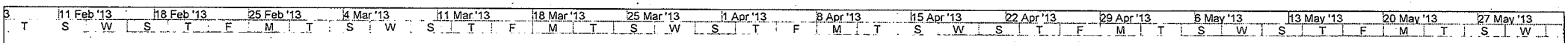
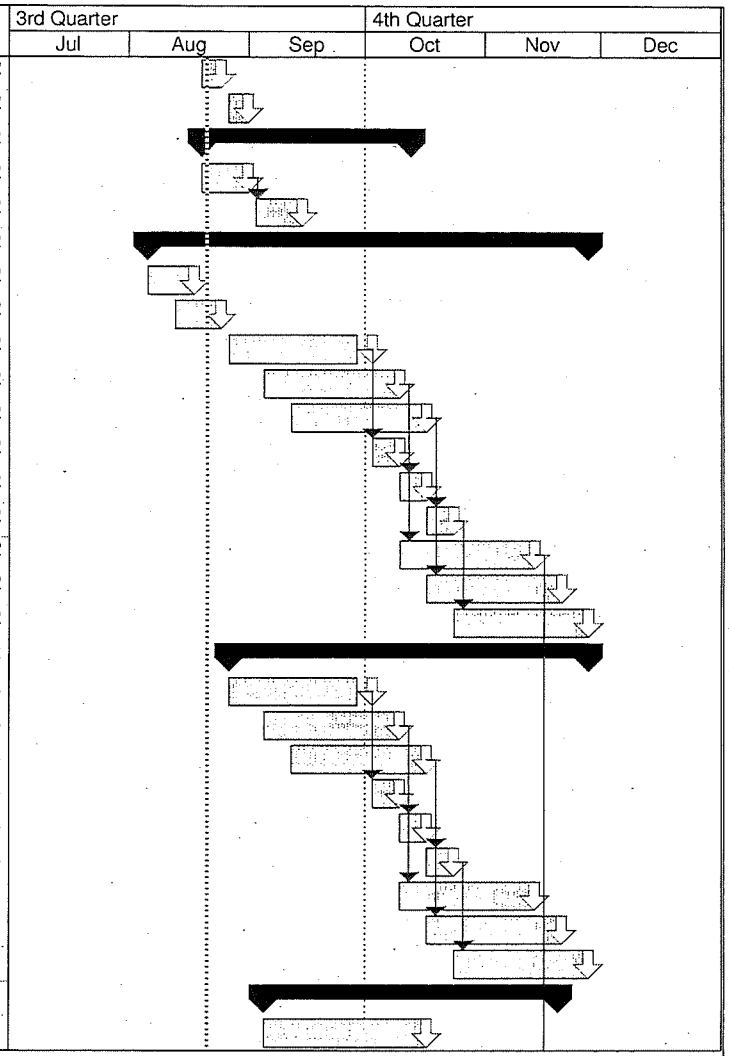
Rolled Up Task	External Tasks	Inactive Milestone	Manual Summary	



Project: 120903 Construction program
Date: Mon 3/09/12

Task	Rolled Up Critical Task	Project Summary	Inactive Summary	Start-only
Critical Task	Rolled Up Milestone	Group By Summary	Manual Task	Finish-only
Milestone	Rolled Up Progress	Inactive Task	Duration-only	Progress
Summary	Split	Inactive Task	Manual Summary Rollup	Deadline
Rolled Up Task	External Tasks	Inactive Milestone	Manual Summary	

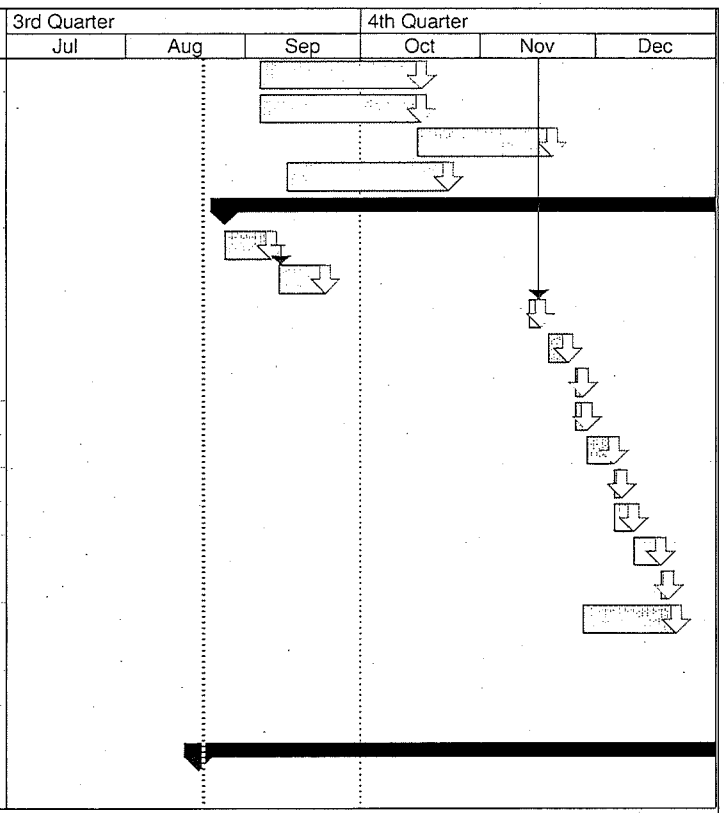
ID	Task Name	Duration	Start	Finish
1	**Survey site set out mast locations**	1 wk	Mon 20/08/12	Fri 24/08/12
2	**Site establishment**	1 wk	Mon 27/08/12	Fri 31/08/12
3	**Foundations**	**40 days**	**Mon 20/08/12**	**Fri 12/10/12**
4	Manufacture foundations bolts	2 wks	Mon 20/08/12	Fri 31/08/12
5	Deliver foundations bolts to site	2 wks	Mon 03/09/12	Fri 14/09/12
10	**Masts**	**82 days**	**Mon 06/08/12**	**Tue 27/11/12**
11	Generate mast manfacturing drawings	2 wks	Mon 06/08/12	Fri 17/08/12
12	Order steel for masts	2 wks	Mon 13/08/12	Fri 24/08/12
13	Manufacture Masts 1 & 2	5 wks	Mon 27/08/12	**Fri 28/09/12**
14	Manufacture Masts 3 & 4	5 wks	Wed 05/09/12	**Tue 09/10/12**
15	Manufacture Masts 5 & 6	5 wks	Wed 12/09/12	**Tue 16/10/12**
16	Load & despatch masts 1 & 2 to port	1 wk	Wed 03/10/12	**Tue 09/10/12**
17	Load & despatch mast 3 & 4 to port	1 wk	Wed 10/10/12	**Tue 16/10/12**
18	Load & despatch masts 5 & 6 to port	1 wk	Wed 17/10/12	**Tue 23/10/12**
19	Sail & deliver masts 1 & 2 to site	5 wks	Wed 10/10/12	Tue 13/11/12
20	Sail & deliver masts 3 & 4 to site	5 wks	Wed 17/10/12	Tue 20/11/12
21	Sail & deliver masts 5 & 6 to site	5 wks	Wed 24/10/12	Tue 27/11/12
22	**Headframes**	**67 days**	**Mon 27/08/12**	**Tue 27/11/12**
23	Manufacture H/frames 1 & 2	5 wks	Mon 27/08/12	**Fri 28/09/12**
24	Manufacture H/frames 3 & 4	5 wks	Wed 05/09/12	**Tue 09/10/12**
25	Manufacture H/frames 5 & 6	5 wks	Wed 12/09/12	**Tue 16/10/12**
26	Load & despatch H/frames 1 & 2 to port	1 wk	Wed 03/10/12	**Tue 09/10/12**
27	Load & despatch H/frames 3 & 4 to port	1 wk	Wed 10/10/12	**Tue 16/10/12**
28	Load & despatch H/frames 5 & 6 to port	1 wk	Wed 17/10/12	**Tue 23/10/12**
29	Sail & deliver H/frames 1 & 2 to site	5 wks	Wed 10/10/12	**Tue 13/11/12**
30	Sail & deliver H/frames 3 & 4 to site	5 wks	Wed 17/10/12	**Tue 20/11/12**
31	Sail & deliver H/frames 5 & 6 to site	5 wks	Wed 24/10/12	**Tue 27/11/12**
32	**Floodlights**	**54 days**	**Wed 05/09/12**	**Mon 19/11/12**
33	Manufacture 178 Nr. AL5911 Floodlights	6 wks	Wed 05/09/12	**Tue 16/10/12**



Project: Manuka Tender Floodlight Pr
Date: Tue 21/08/12

Task
Split
Progress
Milestone
Summary
Rolled Up Task
Rolled Up Split
Rolled Up Milestone
Rolled Up Progress
External Tasks
Project Summary
External Milestone
Deadline

ID	Task Name	Duration	Start	Finish
34	Manufacture 306 Nr. AL5911 Floodlights	6 wks	Wed 05/09/12	**Tue 16/10/12**
35	Manufacture 80 Nr. AL5913 Floodlights	6 wks	Wed 05/09/12	**Tue 16/10/12**
36	Deliver floodlights to site	5 wks	Tue 16/10/12	Mon 19/11/12
37	Depatch floodlight gear & lamps	6 wks	Wed 12/09/12	Tue 23/10/12
38	**Construction Australia**	**98 days**	**Mon 27/08/12**	**Thu 17/01/13**
39	Design gear and distribution cubicles	2 wks	Mon 27/08/12	Fri 07/09/12
40	Switchboard approval	2 wks	Mon 10/09/12	Fri 21/09/12
45	Lay out and preassemble masts 1 & 2	3 days	Wed 14/11/12	Fri 16/11/12
46	Assemble h/frame and fit to masts 1 & 2	5 days	Mon 19/11/12	Fri 23/11/12
47	Lift masts 1 & 2	2 days	Mon 26/11/12	Tue 27/11/12
48	Lay out and preassemble masts 3 & 4	3 days	Mon 26/11/12	Wed 28/11/12
49	Assemble h/frame and fit to masts 3 & 4	5 days	Thu 29/11/12	Wed 05/12/12
50	Lift masts 3 & 4	2 days	Thu 06/12/12	Fri 07/12/12
51	Lay out and preassemble masts 5 & 6	3 days	Thu 06/12/12	Mon 10/12/12
52	Assemble h/frame and fit to masts 5 & 6	5 days	Tue 11/12/12	Mon 17/12/12
53	Lift masts 5 & 6	2 days	Tue 18/12/12	Wed 19/12/12
54	Connect masts to cabinets	18 days	Wed 28/11/12	Fri 21/12/12
56	Aim lights & check light levels night access	9 days	Mon 07/01/13	Thu 17/01/13
57	Inspection and testing	9 days	Mon 07/01/13	Thu 17/01/13
58	Drawings and manuals	9 days	Mon 07/01/13	Thu 17/01/13
60	**Event at Manuka**	**117 days**	**Mon 20/08/12**	**Wed 06/02/13**
98	ODI - AUST V W'INDIES	1 day	Wed 06/02/13	Wed 06/02/13



Project: Manuka Tender Floodlight Pr
Date: Tue 21/08/12

Task
Split
Progress
Milestone
Summary
Rolled Up Task
Rolled Up Split
Rolled Up Milestone
Rolled Up Progress
External Tasks
Project Summary
External Milestone
Deadline

Rea, Peter

From: Ian Smith [Ian.Smith@cox.com.au]
Sent: Wednesday, 3 October 2012 3:11 PM
To: Rajesh Valera
Cc: gsutton@dialight.com.au; Mitch@affinityelectrical.com.au; brendan@affinityelectrical.com.au; Tony Staten; Don Gilson; Rea, Peter; John Anthony; McNulty, Hamish; Florence, Rod; Neil McClymont (nmcclymont@AbacusLighting.com)
Subject: RE: Geotech Report
Attachments: FW: COX Notification - upload; GEOTFYSH09552AA-02 final draft.pdf

Hi Rajesh,

I cannot comment on whether Mitch has seen the report but unfortunately this is not that pertinent to whether this issue constitutes a variation or not.

To make the history clear, the preliminary assessment you just sent formed part of the pre-engagement information, but the attached Geotech report was part of the tender package uploaded to the Dropbox. John Anthony and Neil McClymont as our contact for the purposes of the tender were alerted to the upload on 19 June – see attached email. We of course were relying on them to disseminate the report to the relevant members of the team to ensure its contents we factored into the pricing.

On page 5 it clearly states:

> **3.3 Groundwater**
>
> No Groundwater inflows were observed during the auger drilling, however once NMLC drilling was commenced water was introduced into the borehole and therefore water inflows could not be assessed. We would expect groundwater inflows to occur at depth from the weathered rock and groundwater levels may fluctuate seasonally or in response to weather conditions.

Again, I can't comment on whether the report was forwarded on to Affinity, but if it was not I do not think that this is Cox's, EDD's or TVE's issue. If Greg thinks there is reason to think otherwise please let me know and I am happy to discuss.

To clarify, the report version I sent you this morning is the final version of the report provided at tender, which is the same in terms of general content, except that it adds the field of play tests and analysis.

Hope this assists.

Regards,

IS.

Ian Smith - Director

COX

Cox Architecture
22 Jardine Street, Kingston ACT 2604 Australia
E: Ian.Smith@cox.com.au | T: +61 2 6239 6255 | M: +61 437 037 981 | W: coxarchitecture.com.au | Disclaimer

---

From: Rajesh Valera [mailto:rvalera@AbacusLighting.com]
Sent: Wednesday, 3 October 2012 12:14 PM
To: Ian Smith
Cc: gsutton@dialight.com.au; Mitch@affinityelectrical.com.au; brendan@affinityelectrical.com.au; Tony Staten
Subject: RE: Geotech Report

Hi Ian,

Was talking to Mitch @ Affinity on site and according to him they have only received preliminary report attached which does not indicate any entry of water while testing soil and not the detailed report.

the preliminary report states that should groundwater inflows be encountered within the bored pile holes it is recommended that allowance be made for concreting bored piles using super plasticised concrete and tremie placement methods which you had inquired for clarification in previous email.

I would ask Greg if detailed report which you have forwarded was issued to us and being forwarded to Affinity.

Kind Regards,

For and on behalf of Abacus Lighting Ltd

Rajesh Valera | Abacus Lighting
Site Manager – Manuka Oval - Australia

Mobile: 04 68 422 747 :: Email: rvalera@abacuslighting.com
12B Hansen Cct, Isaacs, ACT 2607, Australia

From: Ian Smith [Ian.Smith@cox.com.au]
Sent: 03 October 2012 02:33
To: Rajesh Valera
Subject:

Ian Smith - Director

COX

Cox Architecture
22 Jardine Street, Kingston ACT 2604 Australia
E: Ian.Smith@cox.com.au | T: +61 2 6239 6255 | M: +61 437 037 981 | W: coxarchitecture.com.au | Disclaimer

****
Abacus Lighting Limited
Oddicroft Lane, Sutton in Ashfield, Nottinghamshire, UK, NG17 5FT
Company Registration Number: 612235
Telephone: +44 (0)1623 511 111 Fax: +44 (0)1623 552 133
www.abacuslighting.com

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****

Keefer, Lindy

From: Ian Smith [Ian.Smith@cox.com.au]
Sent: Tuesday, 19 June 2012 5:59 PM
To: John Anthony; Neil McClymont
Subject: FW: COX Notification - upload

John/Neil,

Geotech report has been uploaded FYI.

IS.

From: dropbox.cox.com.au [mailto:dropbox@cox.com.au]
Sent: Tuesday, 19 June 2012 5:57 PM
To: Ian Smith
Subject: COX Notification - upload

Dear Ian Smith,
the file "GEOTFYSH09552AA-02 final draft.pdf" has been uploaded in "Manuka Oval Lighting" folder. To download this file, follow this link.

coffey geotechnics
SPECIALISTS MANAGING THE EARTH

GEOTECHNICAL INVESTIGATION

Cox Architects

Manuka Oval Redevelopment
Canberra Avenue Manuka ACT

GEOTFYSH09552AA-01
18 June 2012

Coffey Geotechnics Pty Ltd ABN 93 056 929 483
16 Mildura Street, Fyshwick ACT 2609 Australia

18 June 2012

Cox Architects
22 Jardine Street,
Kingston ACT 2604 Australia

Attention: Ian Smith

Dear Sir,

RE: Geotechnical Investigation
Proposed Manuka Oval Redevelopment
Canberra Avenue, Manuka ACT

Coffey Geotechnics Pty Ltd (Coffey) is pleased to present our report on a geotechnical investigation of the above site.

We draw your attention to the attached document following the report titled "Important Information about Your Coffey Report" which should be read in conjunction with this report.

If you require further information please contact the undersigned.

For and on behalf of Coffey Geotechnics Pty Ltd

Jon Thompson CPEng

Principal Geotechnical Engineer

Distribution: 1 hard copy and 1 pdf copy to Cox Architects
1 copy held by Coffey Geotechnics
Original held by Coffey Geotechnics

1	INTRODUCTION	1
2	SCOPE OF WORK	2
2.1	Fieldwork Overview	2
2.2	Laboratory Testing	2
2.2.1	Geotechnical	2
2.2.2	Environmental (to be reported in next phase of reporting)	2
3	SITE CONDITIONS	2
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Important Information about your Coffey Report

Figure

Figure 1: Site Plan Showing Borehole Locations

Appendices

Appendix A: Engineering Logs of Boreholes BH1 to BH6 & Explanatory Notes

Appendix B: Laboratory Test Reports

Appendix C: Site Photos

1 INTRODUCTION

This report presents the results of a geotechnical investigation of the proposed site for the Manuka Oval redevelopment located off Canberra Avenue, Manuka ACT

From the supplied information, Coffey understands that the development will comprise the following;

- Construction of six (6) light towers
- Redevelopment of the Menzies and Hawke grandstands
- Development of a new grandstand beside the scoreboard.

At this stage the report covers the light towers. Further revisions of the report will include the results of investigations for the grandstand and playing field areas, and environmental testing.

The objectives of the investigation were to provide geotechnical advice in relation to the following:

- Provision of appropriate design parameters for each soil/rock layer – including but not limited to density, undrained/drained strength and stiffness;
- Foundation recommendations for all structures including;
    - ultimate shaft and base resistances for applicable pile types and appropriate geotechnical reduction factors;
    - ultimate and allowable bearing pressure for shallow footings – pads and strips;
    - anticipated settlements of piles and shallow footings under working loads;
    - founding levels and pile constructability issues;
- Geotechnical parameters for the design of temporary and permanent retaining walls;
- Design groundwater levels and measures for accommodating groundwater during construction, if applicable;
- Geotechnical parameters for slab on ground design;
- Site classification and characteristic surface movement (y_s) with respect to AS2870;
- Requirements for earthworks in accordance with AS3798, including treatment of any existing fill; materials, excavatability and subgrade preparation works;
- Advice on design with regard to seismicity in accordance with AS1170.4;
- Confirmation of sulphate, chloride, salinity and pH values for soil and groundwater and requirements for durability of embedded structural elements;
- Advice on potential for acid sulphate soils and treatment thereof;
- Safe slope angles for temporary and permanent excavations;
- Details of temporary works requirements with respect to earthworks, dewatering, re-use of excavated materials; and

- The requirements for further geotechnical investigations to reduce geotechnical uncertainty and risk.
- Preliminary indication of beneficial reuse and/or waste classification; and
- Advice on additional investigation requirements and options.

2 SCOPE OF WORK

2.1 Fieldwork Overview

Prior to commencing fieldwork, Coffey carried out a review of available service plans and Dial Before You Dig (DBYD) plans.

The fieldwork for the geotechnical investigation of the light tower sites comprised the following:

- Drilling of 6 boreholes using steel V-bit attached to solid flight augers to practical refusal on bedrock at the proposed lighting tower locations. The boreholes were extended into rock using NMLC coring techniques to a maximum depth of 20.0m.

2.2 Laboratory Testing

The following laboratory testing was carried out on soil samples from the light tower sites.

2.2.1 Geotechnical

- Atterberg Limits tests and Particle Size distribution testing to in relation to assessment of site classification;
- Testing of Salinity, pH, Sulfates, Chlorides to assess soil aggressivity as per the Arup brief;
- Is50 Point Load tests to determine rock strength; and

2.2.2 Environmental (to be reported in next phase of reporting)

- heavy metals (arsenic, cadmium, chromium, copper, mercury nickel, lead, zinc) and asbestos;
- Total Petroleum Hydrocarbons (TPH), Benzene, Toluene, Ethylbenzene, Xylenes (BTEX);
- Polycyclic Aromatic Hydrocarbons (PAH);
- Organochlorine pesticides (OCP), Organophosphorus pesticides (OPP) and Polychlorinated biphenyl's (PCB);

3 SITE CONDITIONS

3.1 Local Geology

The 1:250,000 engineering geology map of Canberra indicates that the site is underlain by Calcareous Shale, Sandstone, Mudstone, Limestone lenses, Tuffaceous Sediments and Rhyolite of the Canberra Group, Camp Hill Sandstone and State Circle Shale groups of Lower Silurian age. It should be noted that fault lines are mapped in the vicinity of the proposed development and that three fault lines are mapped as converging in the vicinity of Manuka Oval.

3.2 Surface Conditions

The six boreholes for the lighting towers were drilled within or adjacent to the tower sites outside of the actual oval at the locations shown in Figure 1. The ground surface at each tower location was near level with no evidence of recent significant disturbance, fill mounds or wet surface conditions. The locations BH4, BH5, were undertaken through pavement material and the location BH2 was undertaken through the red granite carpark material at the main entrance. Subsurface Conditions

The subsurface conditions encountered in the boreholes at the proposed light tower sites may be summarised as follows:

Table 1 – Summary of Generalised Subsurface Conditions-Light Tower Sites

Range of Depths of Unit (m)	Unit and Origin	Description	Distribution
0.0 to 0.05m	Pavement wearing course	Bitumen, 2 coat chip seal (about 10 to 15mm thick)	Encountered from the surface in BH4
0.0 to 0.3m	Fill	Gravelly SAND, grey, fine to coarse sand, fine to medium gravel, assessed dry and of dense consistency	Encountered from the surface in BH5 Encountered below the Pavement wearing course in BH4
0.0 to 0.3m	Carpark Pavement (Crushed Red Granite)	Sandy GRAVEL, red, low plasticity, fine to coarse sands, fine to medium angular o sub-angular gravels.	Encountered from the surface in BH2
0.0 to 0.3m	Topsoil	Sandy SILT, Black, fine to coarse sand, low plasticity, some rootlets, assessed dry and of dense consistency.	Encountered form the surface in BH1, BH3, BH6 Encountered below the Carpark Pavement (Crushed Red Granite) in BH2

Range of Depths of Unit (m)	Unit and Origin	Description	Distribution
0.3 to 2.9m	Residual Material	Clayey Silty SAND, Clayey SAND, Sandy CLAY, Gravelly Sandy CLAY, red/brown, brown, low to medium plasticity, fine to coarse grained sands, some fine to medium angular to sub-angular gravel, assessed dry to moist and of firm to very stiff consistency.	Encountered below the Topsoil materials in BH1, BH2, BH3, BH6 Encountered below the fill materials in BH4, BH5
0.9 to 4.2m	Extremely Weathered Material (Siltstone)	Gravelly Sandy CLAY, Sandy CLAY, Gravelly SILT/CLAY, brown/yellow/white mottled, pale brown, medium plasticity, fine to coarse sands, fine to medium angular to sub-angular gravels, assessed dry and of hard consistency.	Encountered below the Residual materials in BH1, BH2, BH3, BH4, BH5, BH6
1.9 to 6.5m (up to 20.2m in BH4)	Highly Weathered Rock	Siltstone, brown/red, iron staining, fine grained, indistinctly bedded, assessed very low to low strength. Some clay seams of brown/grey High plasticity clays and low plasticity silts.	Encountered below the Extremely Weathered material in BH1, BH2, BH3, BH4, BH5, BH6
4.5 to 13.3	Moderately Weathered Rock	Siltstone, grey/brown, some iron staining, fine grained, indistinctly bedded, assessed low to medium strength.	Encountered below the Highly Weathered rock in BH1, BH2, BH3, BH5, BH6
9.0 to 10.4	Slightly Weathered Rock	Siltstone, grey/blue grey, some iron staining, fine grained, indistinctly bedded, assessed medium high strength.	Encountered below the Moderately Weathered materials in BH6 only

3.3 Groundwater

No Groundwater inflows were observed during the auger drilling, however once NMLC drilling was commenced water was introduced into the borehole and therefore water inflows could not be assessed. We would expect groundwater inflows to occur at depth from the weathered rock and groundwater levels may fluctuate seasonally or in response to weather conditions.

4 LABORATORY TEST RESULTS

4.1 Particle Size Distribution Tests

Table 2 presents a summary of the Particle Size test results on soil samples taken from the boreholes. The laboratory test reports are presented in Appendix B.

Table 2 – Summary of Particle Size test results

Test Location	Clay/Silt (%)	Sand (%)	Gravel (%)
BH1: 2.5m to 2.95m	41	47	11
BH2: 1.0m to 1.45m	63	35	2
BH4: 4.0m to 4.45m	61	34	5
BH-M1: 1.0m to 1.45m	76	23	1
BH-H1: 0.5m to 0.95m	46	43	11

4.2 Atterberg Limit Tests

Table 3 presents a summary of the Atterberg Limit test results on soil samples taken from the boreholes. The laboratory test reports are presented in Appendix B.

Table 3 – Summary of Atterberg Limits Test Results

Test Location	Plastic Limit	Liquid Limit	Plasticity Index	Linear Shrinkage (%)
BH1: 2.5m to 2.95m	17	41	24	12.0
BH4: 4.0m to 4.45m	16	38	22	12.5
BH5: 1.0m to 1.45m	17	31	14	7.0
BH-H1: 0.5m to 0.95m	16	31	15	Not Carried out
BH-P2: 1.0m to 1.4m	15	33	18	11.0

4.3 Aggressivity Testing-Soil Samples

Table 4 presents a summary of the Aggressivity test results on soil samples taken from the boreholes. The laboratory test reports are presented in Appendix B.

Table 4 – Summary of Soil Aggressivity Test Results

Test Location	Moisture Content (%)	pH (1:5)	Chloride (mg/kg)	Resistivity (ohm.m)	Salinity (mg/kg)	Sulphate (mg/kg)
BH1: 3.0m to 3.2m	11	8.7	44	59	120	<10
BH1: 3.7m to 4.0m	16.0	8.5	500	18	420	120.0
BH2: 2.0m to 2.2m	11	7.9	120	44	160	<10
BH3: 1.7m to 1.8m	9.4	7.1	16	150	<50	18.0
BH4: 0.5m to 0.7m	6.4	8.7	<10	70	87	27.0
BH4: 2.5m to 3.4m	11	8.4	<10	260	<50	<10
BH4: 1.8m to 2.0m	8.6	8.8	77	91	15	<10
BH5: 0.8m to 1.0m	11	9.3	200	28	260	83.0
BH6: 1.7m to 2.0m	17	8.0	120	48	160	35.0
BH6: 5.2m to 5.5m	11	8.2	45	160	31	180.0

4.4 Point load testing

The results of Is_{50} Point Load testing of rock core samples taken from the boreholes at selected depths are summarised below in Table 5. We note that due to weathering and fracturing of the rock only suitable intact sections of rock core were tested. The tested sections of rock core may not be representative of the surrounding rock due to variations in weathering and rock structure.

Table 5 – Summary of Is_{50} Point Load Test Results

Core Sample Borehole and Depth	Is_{50} Result (KPa) - Diametral	Rock Strength Classification
BH1: 4.6m	0.2	V Low
BH2: 6.0m	0.5	Low
BH2: 8.2m	3.14	High
BH2: 9.2m	2.48	Medium
BH3: 7.1m	0.14	V Low
BH3: 9.5m	0.47	Low
BH3: 10.5m	0.24	V Low
BH3: 11.4m	0.29	Low
BH5: 4.2m	1.44	Medium
BH5: 5.3m	0.54	Low
BH5: 6.5m	1.99	Medium
BH5: 8.6m	2.55	High
BH6: 6.0m	2.32	Medium
BH6: 7.2m	1.60	Medium
BH6: 8.5m	3.00	High
BH6: 9.5m	2.87	High

5 DISCUSSION AND RECOMMENDATIONS

5.1 Site Classification – AS2870

The classification of a building site in accordance with AS2870-2011 relates to residential single and two level structures or other similar structures such as commercial buildings of similar design. Therefore a site classification for the light tower locations is of little relevance other than as an indication of possible soil reactivity in these areas. Based on the soil conditions encountered in the boreholes and the limited laboratory test results a site classification of Class M-D , in accordance AS 2870-2011 Table 2.3, is considered appropriate

The Characteristic surface movement (y_s) is estimated as:

$$20mm < y_s < 40mm$$

5.2 Earthquake Classification

In accordance AS 1170.4-2007 Section 4.2, the site is classified as Class C_e for Shallow Soil Site(less than 40m) for Stiff to Very Stiff soils as derived from Table 4.1. The site has a Hazard Factor Z = 0.08 as derived from Table 3.2.

5.3 Soil Aggressivity

The laboratory test results for soil aggressivity as presented in Table 4 above have been assessed in accordance with AS2159-2009,Table 6.4 2(C),Exposure Classification for Concrete Piles-Piles in Soil. The results indicate that for the samples tested the exposure classification is Mild where soils are below the groundwater level and non-aggressive where above groundwater.

The exposure classification for Steel Piles in Soil, Table 6.5.2(C) based on the laboratory test results in Table 4 is assessed as Mild to Non Aggressive for soils above groundwater and mild to moderate below

5.4 Footing Design and Bearing Capacity

The foundation conditions at the light tower sites generally comprised stiff to hard soils overlying rock of variable weathering. It is expected that footings for the light towers will comprise a large pad or raft with bored piles or CFA piles socketed into at least low or medium strength rock.

Recommendations for serviceability and ultimate end bearing pressure and shaft adhesion for bored piles or CFA piles founding at least four diameters into the rock material described are as follows:

Table 6- Assessed Bearing Capacity – Bored Piles or CFA Piles, Limit State Design

Unit	Serviceability End Bearing Pressure (kPa)	Ultimate End-Bearing Pressure (kPa)	Ultimate Shaft Adhesion (kPa)	Elastic Modulus (MPa)
Extremely to Highly Weathered Rock of at least very low strength	700	2000	100	150
Highly to Moderately Weathered Rock of at least low strength	1200	3000	200	400
Moderately Weathered Rock of at least medium strength	2000	6000	400	700

An appropriate reduction factor Φ_g should be applied in accordance with AS2159-2009 'Piling – Design and Installations'.

The above recommended allowable side adhesion values assume that the sides of the bored pile holes are mechanically grooved. Previous experience by Coffey indicates that provided the drilling contractor uses an auger and not a bucket to drill the bored piles the above parameters may be adopted and a reduction is not needed. Should the bucket be used to drill the piles the sides of the hole are more likely to be smeared (i.e. not rough) and a reduction in the side adhesion value is likely to be required unless the pile hole is grooved with a specific-purpose grooving tooth. The bases of the bored pile holes should be cleaned with a cleaning bucket.

Should groundwater inflows be encountered within the bored pile holes it is recommended that allowance be made for concreting bored piles using super plasticised concrete and tremie placement methods.

The above recommended values are based on the defect spacing as observed in the logs and the varying rock strength, including the presence of fractured zones and weak seams.

Footings proportioned in accordance with the above recommendations should have load induced settlements of no greater than about 1% of the pile diameter for piles founded within the highly to moderately weathered material.

5.5 Parameters for the Design of Retaining Walls

Earth pressures on retaining walls will depend on the depth and nature of the soil profile being retained. The following design parameters, presented in Table 7, are recommended for the insitu fill materials and topsoil, the natural residual soils, and the weathered rock. The design of retaining walls must take into account any surcharge loading from sloping ground or other loadings behind the wall (e.g. adjacent structures) which will increase the lateral earth pressure loads from the horizontal ground case. Global failure of the structure should be checked for acceptable factors of safety. In general the recommendations of AS4678-2002 are to be followed when designing and constructing retaining walls on the site.

Any backfill placed behind the retaining walls should comprise free-draining granular materials, alternatively, an adequate drainage system behind the walls should be installed. Should drainage not be installed then pore pressures from the build up of groundwater will need to be taken into account in the design of the retaining walls.

TABLE 7 – Summary of Design Parameters for Retaining Walls

Material	Bulk Unit Weight (γ) kN/m^3	Friction Angle (degrees)	Effective Cohesion (c') kPa
Fill/Topsoil	19	22	---
Natural Residual Soils/ Extremely Weathered Rock	21	30	10
Highly Weathered Rock	23	40	10

Note:

** Design pressures for walls supporting moderately and less weathered siltstone will depend on the orientation and spacing of defects in the rock with respect to potential failure surfaces. The parameters provided are based on the defects due to the assessed fractured nature of the observed rock core.

Retaining walls must also be designed to resist water pressures from possible rise in groundwater levels due to rainfall or ruptured water pipes, depending on drainage details provided behind the walls.

5.6 Excavation Conditions and Trafficability

As discussed in Section 1 of this report the proposed development is understood to comprise the construction six lighting towers and the redevelopment of the Menzies and Hawke grandstands and the construction of a new grandstand. Excavations for the footings in the existing flexible pavements / topsoil and residual soils should be readily achieved using backhoes and excavators (larger than 10 tonne) to at least the depth of the overlying soils. Deep excavations in the highly to moderately weathered rock may require larger excavators (larger than 20tonnes). Higher strength rock may also be encountered at depth which may require a larger excavator (greater than 30tonnes with rock hammer) and excavation production rates would be expected to be lower in this rock.

For the bored or CFA pile excavations that need to be socketed into the moderately weathered rock of medium and possibly including some high strength rock, a large piling rig with appropriate rock drilling equipment will be required.

Trafficability over the exposed topsoil and residual clays, if exposed during and following periods of significant rainfall, may be difficult for wheeled vehicles.

Groundwater inflows to shallow excavations are not expected and should be minor where it occurs. Inflows into open pile excavations may occur however we have not assessed possible inflow rates at this stage. For deep bored piles casing would be recommended, or alternatively CFA piles should be considered.

5.7 Re-use of Site Soils as Engineered Fill

The following comments are provided on the potential re-use of excavated materials as engineered fill:

- The silty/sandy topsoil materials are assessed as unsuitable for re-use as engineered fill due to their organic content, sensitivity to changes in moisture content, and corresponding difficulty to achieve the required compaction density. These materials may be re-used selectively for some landscaping works or alternatively be removed from the site. Landscaping works of a sensitive nature will require consideration of the chemical content of the soil.
- The natural residual clays are assessed suitable for re-use as engineered fill provided organic material (eg.tree roots), if encountered, are removed and the excavated soils are free of contaminants. Also these materials would need to be maintained at close to optimum moisture content if proposed for re-use as structural fill on this site or on another site. The highly and moderately weathered rock materials may also be suitable for re-use as compacted fill provided any large lumps can be readily broken down to a maximum particle size of 75mm and sufficient fines are present to allow compaction to be achieved.

  Where suitable excavated materials are proposed for use on another site a waste classification will need to be provided prior to acceptance for re-use. Preliminary advice on the likely waste classification will be provided in the final report.

5.8 Engineered Fill Construction Procedures

The following preliminary recommendations are provided as a guide to site preparation earthworks for the subgrade of external paved or foundation pad areas:

- Strip the topsoil and fill to expose the underlying firm to stiff natural sandy clays. Excavate the natural soils to subgrade depth.
- Compact the exposed surface to at 100% of Standard maximum dry density. Proof-roll the exposed surface with a smooth drum roller of at least 12 tonnes static mass. If during proof rolling areas exhibit visual deflection and do not compact, the material should be over excavated and replaced with suitable fill. A geotechnical engineer should observe the proof rolling to assess the need for additional removal of unsuitable soils.
- All controlled fill should comprise suitable approved material (as specified in AS3798-1996, "Guidelines on Earthworks for Commercial and Residential Developments") for a design CBR value nominated by the designer.

- Where required place suitable fill materials to subgrade level in layers not exceeding 200mm compacted thickness (appropriate layer thickness depends upon the size of compaction plant), and compacted to at least 100% of the Standard maximum dry density, at a moisture ratio within the range of 70% to 100% of the Standard optimum moisture content. The maximum particle size of the select fill after compaction should not exceed 75mm.

5.9 Unsupported Batters (Temporary or Permanent)

Where battering of excavation cuts is required, recommended temporary and permanent batter slopes based on the various materials encountered in the boreholes up to 3m in vertical height are as follows:

	Temporary Batter Slopes	Permanent Batter Slopes
• Fill	1 (V) : 2 (H)	1 (V) : 3 (H)
• Very stiff to hard Residual Soils (clayey)	1 (V) : 1 (H)	1 (V) : 2.5 (H)
• Highly to moderately weathered rock	2(V) : 1(H)	1(V) :1 (H)

It is recommended that no surcharge loadings be placed within a distance of 3m from the crest of a batter cut and that surface water should be diverted away from the crests of batter slopes by catch drains. Permanent cut or compacted fill batters exposing soils or weak rock should be vegetated to reduce the potential for scour and erosion.

Notwithstanding the above recommended batter slopes, there may be unfavourable conditions within the exposed materials which may require further treatment, such as laying back or covering with mesh and shotcreting clean rock faces. Accordingly, it is recommended that the unsupported batters be viewed by Coffey at regular stages during construction and immediately after rainfall to assess any such requirements for stabilising measures.

Should unsupported batters of greater height be required further advice should be sought.

6 TREATMENT OF UNSUITABLE OR WET MATERIAL

Material which becomes wet after placement shall not be compacted until it has dried out so that the moisture content is within this range. The drying process may be assisted by aeration of thin layers(maximum 200mm) of material exposed over a suitably prepared stockpile area, or where approved by the Superintendent, by the use of hydrated or quick lime. Alternatively, the wet material may be transported to a stockpile site for drying out and later use as fill material. If there is insufficient moisture in the material for it to be compacted as specified, water shall be added. The added water shall be applied uniformly and thoroughly mixed with the material until a homogeneous mixture is obtained.

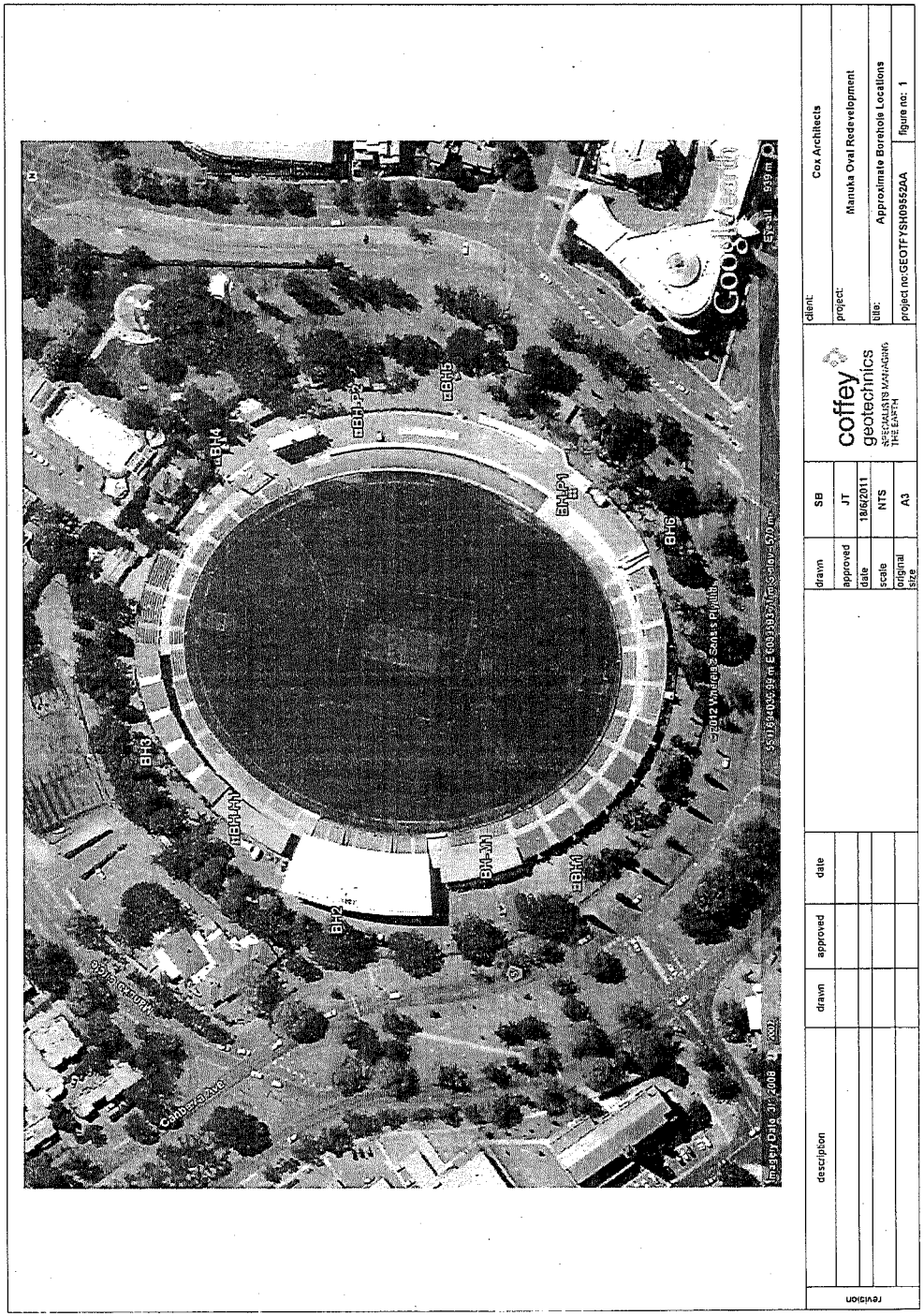
7 LIMITATIONS

The subsurface information, discussion and recommendations presented in this report are based on a limited number of boreholes. Ground conditions can vary over relatively short distances and additional

investigations may be required. Coffey should be engaged to confirm that exposed ground conditions during construction are consistent with the design assumptions.

The attached document entitled "Important Information about Your Coffey Report" presents additional information on the uses and limitations of this report.

Figures


BH1
BH2
BH3
BH4
BH5
BH6
BH1A
BH2A
BH3A
BH4A
BH5A
BH6A
Coogee Beach
Coogee Oval
Coogee Beach Rd
Coogee Oval Dr
Image © 2012 MapData Sciences Pty Ltd
Google
revision
description
drawn
approved
date
client: Cox Architects
project: Manuka Oval Redevelopment
title: Approximate Borehole Locations
project no: GEOTFYSH09552AA
figure no: 1
coffey geotechnics
drawn SB
approved JT
date 18/6/2011
scale NTS
original size A3

Appendix A

Engineering Logs and Core Photos of Boreholes with Explanatory Notes

coffey geotechnics

Engineering Log - Borehole

Borehole No. **BH1**
Sheet 1 of 4
Project No: **GEOTFYSH09552AA**

Client: ***Cox Architects***
Date started: ***30.5.2012***

Principal:
Date completed: ***30.5.2012***

Project: ***Manuka Oval Redevelopment***
Logged by: ***SB***

Borehole Location: ***TOWER 1 - Refer to Figure 1***
Checked by: ***JT***

drill model and mounting: Multidrill 2 Trailer | Easting: 693945 | slope: -90° | R.L. Surface:
hole diameter: 90mm mm | Northing 6089516 | bearing: | datum: 55H

drilling information | **material substance**

method	penetration 1 2 3	support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material: soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetro-meter kPa 100 200 300 400	structure and additional observations
ADV						0			**Sandy SILT:** low plasticity, black, fine to medium sand, some plant materials	D	D		TOPSOIL
									Clayey SILT: low to medium plasticity, brown, fine to coarse grained sand, some fine gravel	D/M	F		RESIDUAL
				U_{50}		1			**Gravelly Sandy CLAY:** medium plasticity, red-brown, fine to coarse grained sand, fine to medium angular gravel		VSt/H	600+	RESIDUAL
				SPT 6,16,20 N*=36		2							
						3			**Gravelly CLAY:** Medium plasticity, brown mottled yellow and white, fine to coarse grained sand, fine to medium gravel	D	H	600+	EXTREMELY WEATHERED MATERIAL
						4							
									Borehole BH1 continued as cored hole				
						5							
						6							
						7							
						8							

method
AS auger screwing*
AD auger drilling*
RR roller/tricone
W washbore
CT cable tool
HA hand auger
DT diatube
B blank bit
V V bit
T TC bit
*bit shown by suffix
e.g. ADT

support
M mud N nil
C casing

penetration
1 2 3 4
no resistance ranging to refusal

water
10/1/98 water level on date shown
water inflow
water outflow

notes, samples, tests
U_{50} undisturbed sample 50mm diameter
U_{63} undisturbed sample 63mm diameter
D disturbed sample
N standard penetration test (SPT)
N* SPT - sample recovered
Nc SPT with solid cone
V vane shear (kPa)
P pressuremeter
Bs bulk sample
E environmental sample
R refusal

classification symbols and soil description based on unified classification system

moisture
D dry
M moist
W wet
Wp plastic limit
W_L liquid limit

consistency/density index
VS very soft
S soft
F firm
St stiff
VSt very stiff
H hard
Fb friable
VL very loose
L loose
MD medium dense
D dense
VD very dense

DRAFT COPY

Form GEO 5.3 Issue 3 Rev 2 BOREHOLE GF9552AA.GPJ COFFEY.GDT 19.6.12

coffey geotechnics

Engineering Log - Cored Borehole

Borehole No. BH1
Sheet 3 of 4
Project No: GEOTFYSH09552AA

Client: Cox Architects
Principal:
Project: Manuka Oval Redevelopment
Borehole Location: TOWER 1 - Refer to Figure 1

Date started: 30.5.2012
Date completed: 30.5.2012
Logged by: SB
Checked by: JT

drill model & mounting: Multidrill 2 Trailer | Easting: 693945 | slope: -90° | R.L. Surface:
hole diameter: 90mm mm drilling fluid: Water | Northing: 6089516 | bearing: | datum: 55H

drilling information					material substance				rock mass defects		
method	core-lift	water	RL	depth metres	graphic log / core recovery	material: rock type; grain characteristics, colour, structure, minor components	weathering alteration	estimated strength (VL L M H VH EH)	Is(50) MPa D-diam-etral A-axial	RQD %	defect spacing mm (30 100 300 1000 3000)	defect description: type, inclination, planarity, roughness, coating, thickness — particular	defect description — general
				1									
				2									
				3									
				4		Continued from non-cored borehole							
NMLC				5		SILTSTONE: Red-brown, iron staining, indistinctly bedded, fine grained	HW/XW						
				6		SILTSTONE: Spotted grey, iron staining, indistinctly bedded, fine grained	MW					JT, 45°, 25mm, PL, RO, SN JT, 20°, 20mm, PL, RO, SN JT, 20°, 20mm, PL, RO, SN JT, 20°, 20mm, IR, RO, SN JT, 45°, 30mm, PL, RO, SN Highly fractured zone 900mm JT and PT JT, 10°, 5mm, PL, RO, SN JT, 10°, 5mm, PL, RO, SN	
				7									
				8									

method: DT diatube; AS auger screwing; AD auger drilling; RR roller/tricone; CB claw or blade bit; NMLC NMLC core; NQ, HQ, PQ wireline core

core-lift: casing used; barrel withdrawn

graphic log/core recovery: core recovered - graphic symbols indicate material; no core recovered

water: 10/1/98 water level on date shown; water inflow; partial drill fluid loss; complete drill fluid loss; 25 water pressure test result (lugeons) for depth interval shown

weathering: FR fresh; SW slightly weathered; MW moderately weathered; HW highly weathered; XW extremely weathered; DW distinctly weathered (covers MW and HW)

strength: VL very low; L low; M medium; H high; VH very high; EH extremely high

defect type: JT joint; PT parting; SM seam; SZ sheared zone; SS sheared surface; CS crushed seam

planarity: PL planar; CU curved; UN undulating; ST stepped; IR irregular

roughness: VR very rough; RO rough; SO smooth; SL slickensided

coating: CN clean; SN stained; VN veneer; CO coating

Form GEO 5.5 Issue 3 Rev. 3

CORED BOREHOLE GF9552AA.GPJ COFFEY.GDT 19.6.12

coffey geotechnics

Engineering Log - Cored Borehole

Borehole No. BH1
Sheet 4 of 4
Project No: GEOTFYSH09552AA

Client: Cox Architects
Principal:
Project: Manuka Oval Redevelopment
Borehole Location: TOWER 1 - Refer to Figure 1

Date started: 30.5.2012
Date completed: 30.5.2012
Logged by: SB
Checked by: JT

drill model & mounting: Multidrill 2 Trailer | Easting: 693945 | slope: -90° | R.L. Surface:
hole diameter: 90mm mm drilling fluid: Water | Northing: 6089516 | bearing: | datum: 55H

drilling information					material substance				rock mass defects		
method	core-lift	water	RL	depth metres	graphic log / core recovery	material: rock type; grain characteristics, colour, structure, minor components	weathering alteration	estimated strength (VL L M H VH EH)	Is(50) MPa D-diam-etral A-axial	RQD %	defect spacing mm (30 100 300 1000 3000)	defect description: type, inclination, planarity, roughness, coating, thickness — particular	defect description — general
NMLC				9		SILTSTONE: Spotted grey, iron staining, indistinctly bedded, fine grained *(continued)*	MW					JT, 20°, 10mm, IR, RO, SN JT, 45°, 25mm, PL, RO, SN JT, 45°, 25mm, PL, RO, SN JT, 45°, 25mm, PL, RO, SN JT, 20°, 15mm, PL, RO, SN Highly fractured zone 450mm JT and PT JT, 10°, 10mm, PL, RO, SN JT, 10°, 10mm, PL, RO, SN JT, 20°, 20mm, IR, RO, SN JT, 20°, 20mm, IR, RO, SN JT, 10°, 10mm, PL, RO, SN JT, 20°, 20mm, IR, RO, SN JT, 20°, 20mm, IR, RO, SN JT, 45°, 20mm, PL, RO, SN Highly fractured zone 250mm JT and PT JT, 10°, 10mm, PL, RO, SN JT, 45°, 20mm, PL, RO, SN JT, 30°, 20mm, PL, RO, SN JT, 20°, 20mm, IR, RO, SN JT, 20°, 20mm, IR, RO, SN JT, 10°, 20mm, PL, RO, SN JT, 10°, 20mm, PL, RO, SN JT, 10°, 20mm, PL, RO, SN JT, 10°, 20mm, PL, RO, SN	
				10									
				11									
				12		BH1 terminated at 12.4m							
				13									
				14									
				15									
				16									

method: DT diatube; AS auger screwing; AD auger drilling; RR roller/tricone; CB claw or blade bit; NMLC NMLC core; NQ, HQ, PQ wireline core

core-lift: casing used; barrel withdrawn

graphic log/core recovery: core recovered - graphic symbols indicate material; no core recovered

water: 10/1/98 water level on date shown; water inflow; partial drill fluid loss; complete drill fluid loss; 25 water pressure test result (lugeons) for depth interval shown

weathering: FR fresh; SW slightly weathered; MW moderately weathered; HW highly weathered; XW extremely weathered; DW distinctly weathered (covers MW and HW)

strength: VL very low; L low; M medium; H high; VH very high; EH extremely high

defect type: JT joint; PT parting; SM seam; SZ sheared zone; SS sheared surface; CS crushed seam

planarity: PL planar; CU curved; UN undulating; ST stepped; IR irregular

roughness: VR very rough; RO rough; SO smooth; SL slickensided

coating: CN clean; SN stainr; VN ven; CO co

Form GEO 5.5 Issue 3 Rev. 3

CORED BOREHOLE GF9552AA.GPJ COFFEY.GDT 19.6.12

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Engineering Log - Borehole

Borehole No. **BH2**
Sheet 1 of 4
Project No: **GEOTFYSH09552AA**

Client: **Cox Architects**
Date started: **1.6.2012**
Principal:
Date completed: **1.6.2012**
Project: **Manuka Oval Redevelopment**
Logged by: **SB**
Borehole Location: **TOWER 2 - Refer to Figure 1**
Checked by: **JT**

drill model and mounting: Multidrill 2 Trailer | Easting: 693926 | slope: -90° | R.L. Surface:
hole diameter: 90mm mm | Northing: 6089612 | bearing: | datum: 55H

drilling information						material substance						
method	penetration 1 2 3	support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material: soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetrometer kPa 100 200 300 400	structure and additional observations
ADV		N				0			**FILL: Sandy GRAVEL:** Fine to medium grained, red, fine to coarse grained sand, with a trace of medium plasticity clay.	D			FILL (Crushed rock granite)
									TOPSOIL: Sandy SILT: Low plasticity, black, fine to medium grained sand, with some plant materials				FILL - TOPSOIL
						1		CL	**Sandy CLAY:** Medium plasticity, red/brown, fine to medium grained sand, with a trace of fine grained gravel.		St		RESIDUAL SOIL
				SPT 9,16,19 N*=35									
						2		CL	**Sandy CLAY:** Medium plasticity, pale brown, fine to coarse grained sand, with a trace of fine to medium grained gravel.		VSt/H	600	EXTREMELY WEATHERED MATERIAL
									Borehole BH2 continued as cored hole				
						3							
						4							
						5							
						6							
						7							
						8							

method
AS auger screwing*
AD auger drilling*
RR roller/tricone
W washbore
CT cable tool
HA hand auger
DT diatube
B blank bit
V V bit
T TC bit
*bit shown by suffix e.g. ADT

support
M mud N nil
C casing
penetration 1 2 3 4 — no resistance ranging to refusal
water
10/1/98 water level on date shown
water inflow
water outflow

notes, samples, tests
U_{50} undisturbed sample 50mm diameter
U_{63} undisturbed sample 63mm diameter
D disturbed sample
N standard penetration test (SPT)
N* SPT - sample recovered
Nc SPT with solid cone
V vane shear (kPa)
P pressuremeter
Bs bulk sample
E environmental sample
R refusal

classification symbols and soil description based on unified classification system
moisture
D dry
M moist
W wet
Wp plastic limit
W_L liquid limit

consistency/density index
VS very soft
S soft
F firm
St stiff
VSt very stiff
H hard
Fb friable
VL very loose
L loose
MD medium dense
D dense
VD very dense

Form GEO 5.3 Issue 3 Rev 2
BOREHOLE GF9552AA.GPJ COFFEY.GDT 19.6.12

coffey geotechnics

Engineering Log - Cored Borehole

Borehole No. **BH2**
Sheet 3 of 4
Project No: **GEOTFYSH09552AA**

Client: **Cox Architects**
Date started: **1.6.2012**
Principal:
Date completed: **1.6.2012**
Project: **Manuka Oval Redevelopment**
Logged by: **SB**
Borehole Location: **TOWER 2 - Refer to Figure 1**
Checked by: **JT**

drill model & mounting: Multidrill 2 Trailer | Easting: 693926 | slope: -90° | R.L. Surface:
hole diameter: 90mm mm | drilling fluid: Water | Northing: 6089612 | bearing: | datum: 55H

drilling information					material substance					rock mass defects	
method	core-lift	water	RL	depth metres	graphic log / core recovery	material: rock type; grain characteristics, colour, structure, minor components	weathering alteration	estimated strength VL L M H VH EH	$Is_{(50)}$ MPa D- diametral A- axial	RDD %	defect spacing mm 30 100 300 1000 3000	defect description: type, inclination, planarity, roughness, coating, thickness — particular / general
				0								
				1								
				2		Continued from non-cored borehole						
NMLC				3		**SILTSTONE:** Red-brown, fine grained	XW/HW					
				4		**SILSTONE:** Grey, with some iron staining, fine grained, indistinctly bedded.	HW					PT, 80, 60mm, PL, RO, SN JT, 70°, 10mm, RO, PL, SN JT, 50°, 20mm, IR, RO, SN JT, 75°, 30mm, IR, RO, SN JT, 70°, 80mm, RO, PL, SN JT, 20°, 20mm, RO, PL, SN
				5								Highly fractured zone 50mm JT and PT JT, 40°, 20mm, RO, PL, SN JT, 40°, 20mm, RO, PL, SN JT, 40°, 20mm, RO, PL, SN JT, 20°, 10mm, IR, RO, SN
				6			MW					JT, 20°, 10mm, RO, PL, SN JT, 20°, 10mm, RO, PL, SN
				7								JT, 30°, 20mm, RO, PL, SN JT, 30°, 20mm, RO, PL, SN JT, 10°, 10mm, RO, PL, SN Highly fractured zone 150mm JT and PT
				8								

method
DT diatube
AS auger screwing
AD auger drilling
RR roller/tricone
CB claw or blade bit
NMLC NMLC core
NO, HQ, PQ wireline core

core-lift
casing used
barrel withdrawn
graphic log/core recovery
core recovered - graphic symbols indicate material
no core recovered

water
10/1/98 water level on date shown
water inflow
partial drill fluid loss
complete drill fluid loss
25 water pressure test result (lugeons) for depth interval shown

weathering
FR fresh
SW slightly weathered
MW moderately weathered
HW highly weathered
XW extremely weathered
DW distinctly weathered (covers MW and HW)
strength
VL very low
L low
M medium
H high
VH very high
EH extremely high

defect type
JT joint
PT parting
SM seam
SZ sheared zone
SS sheared surface
CS crushed seam
planarity
PL planar
CU curved
UN undulating
ST stepped
IR irregular
roughness
VR very rough
RO rough
SO smooth
SL slickensided
coating
CN clean
SN stained
VN veneer
CO coating

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CORED BOREHOLE GF9552AA.GPJ COFFEY.GDT 19.6.12

coffey geotechnics

Engineering Log - Cored Borehole

Borehole No. **BH2**
Sheet 4 of 4
Project No: **GEOTFYSH09552AA**

Client: **Cox Architects**
Date started: **1.6.2012**

Principal:
Date completed: **1.6.2012**

Project: **Manuka Oval Redevelopment**
Logged by: **SB**

Borehole Location: **TOWER 2 - Refer to Figure 1**
Checked by: **JT**

drill model & mounting: Multidrill 2 Trailer | Easting: 693926 | slope: -90° | R.L. Surface:
hole diameter: 90mm mm | drilling fluid: Water | Northing: 6089812 | bearing: | datum: 55H

drilling information | **material substance** | **rock mass defects**

method	core-lift	water	RL	depth metres	graphic log / core recovery	material: rock type, grain characteristics, colour, structure, minor components	weathering / alteration	estimated strength (VL L M H VH EH)	$Is_{(50)}$ MPa D- diametral A- axial	RQD %	defect spacing mm (30 100 300 1000 3000)	defect description: type, inclination, planarity, roughness, coating, thickness — particular	defect description — general
NMLC				9		**SILSTONE:** Grey, with some iron staining, fine grained, indistinctly bedded. *(continued)*	MW / SW					— JT, 45°, 30mm, RO, PL, SN — Highly fractured zone 780mm JT and PT	
				10								— JT, 30°, 30mm, RO, PL, SN \ JT, 30°, 30mm, RO, PL, SN — JT, 30°, 30mm, RO, PL, SN \ JT, 30°, 30mm, RO, PL, SN \ PT, 40°, 40mm, RO, PL, SN	
				11		BH2 terminated at 10.3m							
				12									
				13									
				14									
				15									
				16									

method: DT diatube; AS auger screwing; AD auger drilling; RR roller/tricone; CB claw or blade bit; NMLC NMLC core; NQ, HQ, PQ wireline core

core-lift: casing used; barrel withdrawn

graphic log/core recovery: core recovered + graphic symbols indicate material; no core recovered

water: 10/1/98 water level on date shown; water inflow; partial drill fluid loss; complete drill fluid loss; water pressure test result (lugeons) for depth interval shown (25)

weathering: FR fresh; SW slightly weathered; MW moderately weathered; HW highly weathered; XW extremely weathered; DW distinctly weathered (covers MW and HW)

strength: VL very low; L low; M medium; H high; VH very high; EH extremely high

defect type: JT joint; PT parting; SM seam; SZ sheared zone; SS sheared surface; CS crushed seam

planarity: PL planar; CU curved; UN undulating; ST stepped; IR irregular

roughness: VR very rough; RO rough; SO smooth; SL slickensided

coating: CN clean; SN stained; VN veneer; CO coating

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Engineering Log - Borehole

Borehole No. **BH3**
Sheet 1 of 4
Project No: **GEOTFYSH09552AA**

Client: **Cox Architects**
Date started: **31.5.2012**

Principal:
Date completed: **31.5.2012**

Project: **Manuka Oval Redevelopment**
Logged by: **SB**

Borehole Location: **TOWER 3 - Refer to Figure 1**
Checked by: **JT**

drill model and mounting: Multidrill 2 Trailer | Easting: 693996 | slope: -90° | R.L. Surface:
hole diameter: 90mm mm | Northing 6089687 | bearing: | datum: 55H

drilling information | **material substance**

method	penetration 1 2 3	support	water	notes, samples, tests, etc	RL	depth metres	graphic log	classification symbol	material: soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency / density index	pocket penetrometer kPa (100 200 300 400)	structure and additional observations
ADV		N		E					**TOPSOIL; Sandy SILT:** Low plasticity, pale black, fine to coarse grained sand, with some plant material	D	D		TOPSOIL
				E				ML	**Sandy SILT:** Low plasticity, brown/pale brown, fine to medium grained sand.		St		RESIDUAL SOIL
				SPT 9,13,17 N*=30		1		CL	**Silty Sandy CLAY/Clayey Sandy SILT:** Low plasticity, pale brown, fine to medium grained sand, with some fine to medium grained gravel.		VSt	>600	
				E		2		ML	**Gravelly Clayey SILT:** Low to medium plasticity, pale brown, fine to coarse grained gravel, with some fine to medium grained sand.		H		EXTREMELY WEATHERED MATERIAL
									Borehole BH3 continued as cored hole				
						3							
						4							
						5							
						6							
						7							
						8							

method: AS auger screwing*; AD auger drilling*; RR roller/tricone; W washbore; CT cable tool; HA hand auger; DT diatube; B blank bit; V V bit; T TC bit; *bit shown by suffix e.g. ADT

support: M mud; N nil; C casing

penetration 1 2 3 4: no resistance ranging to refusal

water: 10/1/98 water level on date shown; water inflow; water outflow

notes, samples, tests: U_{50} undisturbed sample 50mm diameter; U_{63} undisturbed sample 63mm diameter; D disturbed sample; N standard penetration test (SPT); N* SPT - sample recovered; Nc SPT with solid cone; V vane shear (kPa); P pressuremeter; Bs bulk sample; E environmental sample; R refusal

classification symbols and soil description based on unified classification system

moisture: D dry; M moist; W wet; Wp plastic limit; W_L liquid limit

consistency/density index: VS very soft; S soft; F firm; St stiff; VSt very stiff; H hard; Fb friable; VL very loose; L loose; MD medium dense; D dense; VD very dense

Form GEO 5.3 Issue 3 Rev.2
BOREHOLE GF9552AA.GPJ COFFEY.GDT 19.6.12

coffey geotechnics

Engineering Log - Cored Borehole

Borehole No. BH3
Sheet 3 of 4
Project No: GEOTFYSH09552AA

Client: Cox Architects
Date started: 31.5.2012

Principal:
Date completed: 31.5.2012

Project: Manuka Oval Redevelopment
Logged by: SB

Borehole Location: TOWER 3 - Refer to Figure 1
Checked by: JT

drill model & mounting: Multidrill 2 Trailer | Easting: 693996 | slope: -90° | R.L. Surface:
hole diameter: 90mm mm | drilling fluid: Water | Northing: 6089687 | bearing: | datum: 55H

drilling information					material substance					rock mass defects		
method	core-lift	water	RL	depth metres	graphic log / core recovery	material: rock type; grain characteristics, colour, structure, minor components	weathering / alteration	estimated strength (VL L M H VH EH)	$Is_{(50)}$ MPa, D- diametral A- axial	RQD %	defect spacing mm (30 100 300 1000 3000)	defect description: type, inclination, planarity, roughness, coating, thickness — particular / general
				1								
				2		Continued from non-cored borehole						
NMLC				3		CLAYSTONE: Brown, fine grained, indistinctly bedded.	HW					
				4								
				5								
				6								—CS, 30mm Silt and clay
				7		SILTSTONE: Red/brown/grey, fine grained, indistinctly bedded.						—CS, 50mm Silt and clay
				8								—JT, 10°, 10mm, PL, RO, SN —JT, 10°, 10mm, PL, RO, SN

method: DT diatube; AS auger screwing; AD auger drilling; RR roller/tricone; CB claw or blade bit; NMLC NMLC core; NQ, HQ, PQ wireline core

core-lift: casing used; barrel withdrawn

graphic log/core recovery: core recovered - graphic symbols indicate material; no core recovered

water: 10/1/98 water level on date shown; water inflow; partial drill fluid loss; complete drill fluid loss; water pressure test result (lugeons) for depth interval shown (25)

weathering: FR fresh; SW slightly weathered; MW moderately weathered; HW highly weathered; XW extremely weathered; DW distinctly weathered (covers MW and HW)

strength: VL very low; L low; M medium; H high; VH very high; EH extremely high

defect type: JT joint; PT parting; SM seam; SZ sheared zone; SS sheared surface; CS crushed seam

planarity: PL planar; CU curved; UN undulating; ST stepped; IR irregular

roughness: VR very rough; RO rough; SO smooth; SL slickensided

coating: CN clean; SN stained; VN veneer; CO coating

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Engineering Log - Cored Borehole

Borehole No. BH3
Sheet 4 of 4
Project No: GEOTFYSH09552AA

Client: Cox Architects
Date started: 31.5.2012

Principal:
Date completed: 31.5.2012

Project: Manuka Oval Redevelopment
Logged by: SB

Borehole Location: TOWER 3 - Refer to Figure 1
Checked by: JT

drill model & mounting: Multidrill 2 Trailer | Easting: 693996 | slope: -90° | R.L. Surface:
hole diameter: 90mm mm | drilling fluid: Water | Northing: 6089687 | bearing: | datum: 55H

drilling information					material substance					rock mass defects		
method	core-lift	water	RL	depth metres	graphic log / core recovery	material: rock type; grain characteristics, colour, structure, minor components	weathering / alteration	estimated strength (VL L M H VH EH)	$Is_{(50)}$ MPa, D- diametral A- axial	RQD %	defect spacing mm (30 100 300 1000 3000)	defect description: type, inclination, planarity, roughness, coating, thickness — particular / general
NMLC				9		SILTSTONE: Red/brown/grey, fine grained, indistinctly bedded. *(continued)*	HW					—JT, 30°, 40mm, PL, RO, SN Highly fractured zone 200mm —JT, 20°, 10mm, PL, RO, SN —JT, 10°, 10mm, PL, RO, SN —JT, 30°, 40mm, PL, RO, SN
				10								—PT, 70°, 70mm, PL, RO, SN —JT, 10°, 10mm, PL, RO, SN —JT, 40°, 40mm, PL, RO, SN —JT, 10°, 20mm, PL, RO, SN —Highly fractured zone 100mm
				11								—JT, 45°, 40mm, ST, RO, SN —JT, 10°, 10mm, PL, RO, SN —JT, 10°, 10mm, PL, RO, SN —JT, 10°, 10mm, PL, RO, SN —JT, 10°, 10mm, PL, RO, SN
				12								—JT, 10°, 10mm, PL, RO, SN —JT, 10°, 10mm, PL, RO, SN —JT, 10°, 10mm, PL, RO, SN —JT, 10°, 10mm, PL, RO, SN Highly fractured zone 150mm JT and PT —JT, 10°, 10mm, PL, RO, SN —JT, 10°, 10mm, PL, RO, SN
				13								—Highly fractured zone 1100mm
				14		BH3 terminated at 13.2m						
				15								
				16								

method: DT diatube; AS auger screwing; AD auger drilling; RR roller/tricone; CB claw or blade bit; NMLC NMLC core; NQ, HQ, PQ wireline core

core-lift: casing used; barrel withdrawn

graphic log/core recovery: core recovered - graphic symbols indicate material; no core recovered

water: 10/1/98 water level on date shown; water inflow; partial drill fluid loss; complete drill fluid loss; water pressure test result (lugeons) for depth interval shown (25)

weathering: FR fresh; SW slightly weathered; MW moderately weathered; HW highly weathered; XW extremely weathered; DW distinctly weathered (covers MW and HW)

strength: VL very low; L low; M medium; H high; VH very high; EH extremely high

defect type: JT joint; PT parting; SM seam; SZ sheared zone; SS sheared surface; CS crushed seam

planarity: PL planar; CU curved; UN undulating; ST stepped; IR irregular

roughness: VR very rough; RO rough; SO smooth; SL slickensided

coating: CN clean; SN stained; VN veneer; CO coating

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Engineering Log - Borehole

Borehole No. BH4
Sheet 1 of 6
Project No: GEOTFYSH09552AA

Client: Cox Architects
Date started: 31.5.2012
Principal:
Date completed: 31.5.2012
Project: Manuka Oval Redevelopment
Logged by: SB
Borehole Location: TOWER 4 - Refer to Figure 1
Checked by: JT

drill model and mounting: Multidrill 2 Trailer | Easting: 694122 | slope: -90° | R.L. Surface:
hole diameter: 90mm mm | Northing: 6089656 | bearing: | datum: 55H

drilling information | **material substance**

method	penetration 1 2 3	support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material: soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetrometer kPa 100 200 300 400	structure and additional observations
ADV		N				0			BITUMINOUS SEAL 30mm thick	D			BITUMINOUS SEAL 30mm
				D				SC	FILL: Gravelly SAND: Fine to coarse grained, pale grey, fine to medium grained gravel. Clayey SAND: Fine to coarse grained, red-brown, medium plasticity clay, with a trace of fine gravel.		MD		RESIDUAL SOIL
				SPT 3,5,5 N*=10		1					D	600	
				D		2							
				SPT 5,5,7 N*=12		3		CH	Sandy CLAY: High plasticity, red-brown, fine to coarse grained sand.		VSt	600	EXTREMELY WEATHERED MATERIAL
				D									
				SPT 7,9,13 N*=22		4						600	
						5							
						6			Borehole BH4 continued as cored hole				
						7							
						8							

method
AS auger screwing*
AD auger drilling*
RR roller/tricone
W washbore
CT cable tool
HA hand auger
DT dialube
B blank bit
V V bit
T TC bit
*bit shown by suffix
e.g. ADT

support
M mud N nil
C casing

penetration 1 2 3 4 — no resistance ranging to refusal

water
10/1/98 water level on date shown
water inflow
water outflow

notes, samples, tests
U_{50} undisturbed sample 50mm diameter
U_{63} undisturbed sample 63mm diameter
D disturbed sample
N standard penetration test (SPT)
N* SPT - sample recovered
Nc SPT with solid cone
V vane shear (kPa)
P pressuremeter
Bs bulk sample
E environmental sample
R refusal

classification symbols and soil description
based on unified classification system

moisture
D dry
M moist
W wet
Wp plastic limit
W_L liquid limit

consistency/density index
VS very soft
S soft
F firm
St stiff
VSt very stiff
H hard
Fb friable
VL very loose
L loose
MD medium dense
D dense
VD very dense

Form GEO 5.3 Issue 3 Rev.2
BOREHOLE GF9552AA.GPJ COFFEY.GDT 19.6.12

coffey geotechnics

Engineering Log - Cored Borehole

Borehole No. BH4
Sheet 4 of 6
Project No: GEOTFYSH09552AA

Client: Cox Architects
Date started: 31.5.2012
Principal:
Date completed: 31.5.2012
Project: Manuka Oval Redevelopment
Logged by: SB
Borehole Location: TOWER 4 - Refer to Figure 1
Checked by: JT

drill model & mounting: Multidrill 2 Trailer | Easting: 694122 | slope: -90° | R.L. Surface:
hole diameter: 90mm mm | drilling fluid: Water | Northing: 6089656 | bearing: | datum: 55H

drilling information | **material substance** | **rock mass defects**

method	core-lift	water	RL	depth metres	graphic log / core recovery	material: rock type; grain characteristics, colour, structure, minor components	weathering alteration	estimated strength VL L M H VH EH	Is(50) MPa D- diametral A- axial	ROD %	defect spacing mm 30 100 300 1000 3000	defect description: type, inclination, planarity, roughness, coating, thickness — particular	defect description — general
				0									
				1									
				2									
				3									
				4									
				5									
						Continued from non-cored borehole							
NMLC				6		SILTSTONE: Highly weathered, red-brown, with some section of extremely weathered silty clayey sand.	HW/XW						
				7									
				8									

method
DT dialube
AS auger screwing
AD auger drilling
RR roller/tricone
CB claw or blade bit
NMLC NMLC core
NQ, HQ, PQ wireline core

core-lift
casing used
barrel withdrawn

graphic log/core recovery
core recovered - graphic symbols indicate material
no core recovered

water
10/1/98 water level on date shown
water inflow
partial drill fluid loss
complete drill fluid loss
25 water pressure test result (lugeons) for depth interval shown

weathering
FR fresh
SW slightly weathered
MW moderately weathered
HW highly weathered
XW extremely weathered
DW distinctly weathered (covers MW and HW)

strength
VL very low
L low
M medium
H high
VH very high
EH extremely high

defect type
JT joint
PT parting
SM seam
SZ sheared zone
SS sheared surface
CS crushed seam

planarity
PL planar
CU curved
UN undulating
ST stepped
IR irregular

roughness
VR very rough
RO rough
SO smooth
SL slickensided

coating
CN clean
SN stained
VN veneer
CO coating

Form GEO 5.5 Issue 3 Rev. 3
CORED BOREHOLE GF9552AA.GPJ COFFEY.GDT 19.6.12

coffey geotechnics

Engineering Log - Cored Borehole

Client: *Cox Architects*

Principal:

Project: *Manuka Oval Redevelopment*

Borehole Location: *TOWER 4 - Refer to Figure 1*

Borehole No. *BH4*

Sheet 5 of 6

Project No: *GEOTFYSH09552AA*

Date started: *31.5.2012*

Date completed: *31.5.2012*

Logged by: *SB*

Checked by: *JT*

drill model & mounting: Multidrill 2 Trailer | Easting: 694122 | slope: -90° | R.L. Surface:

hole diameter: 90mm mm | drilling fluid: Water | Northing: 6089656 | bearing: | datum: 55H

drilling information					material substance					rock mass defects		
method	core-lift	water	RL	depth metres	graphic log / core recovery	material: rock type; grain characteristics, colour, structure, minor components	weathering / alteration	estimated strength (VL L M H VH EH)	$Is_{(50)}$ MPa D-diametral A-axial	RQD %	defect spacing mm (30 100 300 1000 3000)	defect description: type, inclination, planarity, roughness, coating, thickness — particular / general
NMLC				9		SILTSTONE: Highly weathered, red-brown, with some section of extremely weathered silty clayey sand. *(continued)*	HW/XW					—JT, 0°, 10mm, PL, RO, SN
						EXTREMELY WEATHERED MATERIAL; Silty Clayey SAND: Red-brown.	XW					—JT, 0°, 10mm, PL, RO, SN
							HW/XW					—JT, 0°, 10mm, PL, RO, SN
						SILTSTONE: Highly weathered, red-brown, siltstone with interbedded extremely weathered silty clayey sand.						
				10			HW					
				11		NO CORE: 1100mm	-					
				12		SILTSTONE: Highly weathered, red-brown, with interbedded extremely weathered silty clayey sand.	HW					
				13								
				14								—JT, 10°, 10mm, PL, RO, SN
												—JT, 10°, 10mm, PL, RO, SN —JT, 20°, 20mm, IR, RO, SN —Highly fractured zone 1400mm
				15		SILTSTONE: Highly weathered, red-brown, siltstone with interbedded extremely weathered silty clayey sand.	HW/XW					
				16		NO CORE: 200mm	-					

method: DT diatube; AS auger screwing; AD auger drilling; RR roller/tricone; CB claw or blade bit; NMLC NMLC core; NQ, HQ, PQ wireline core

core-lift: casing used; barrel withdrawn

graphic log/core recovery: core recovered - graphic symbols indicate material; no core recovered

water: 10/1/98 water level on date shown; water inflow; partial drill fluid loss; complete drill fluid loss; 25 water pressure test result (lugeons) for depth interval shown

weathering: FR fresh; SW slightly weathered; MW moderately weathered; HW highly weathered; XW extremely weathered; DW distinctly weathered (covers MW and HW)

strength: VL very low; L low; M medium; H high; VH very high; EH extremely high

defect type: JT joint; PT parting; SM seam; SZ sheared zone; SS sheared surface; CS crushed seam

planarity: PL planar; CU curved; UN undulating; ST stepped; IR irregular

roughness: VR very rough; RO rough; SO smooth; SL slickensided

coating: CN clean; SN stained; VN veneer; CO coating

CORED BOREHOLE GF9552AA.GPJ COFFEY.GDT 19.6.12

Form GEO 5.5 Issue 3 Rev. 3

coffey geotechnics

Engineering Log - Cored Borehole

Client: Cox Architects

Principal:

Project: Manuka Oval Redevelopment

Borehole Location: TOWER 4 - Refer to Figure 1

Borehole No. BH4

Sheet 6 of 6

Project No: GEOTFYSH09552AA

Date started: 31.5.2012

Date completed: 31.5.2012

Logged by: SB

Checked by: JT

drill model & mounting: Multidrill 2 Trailer | Easting: 694122 | slope: -90° | R.L. Surface:

hole diameter: 90mm mm | drilling fluid: Water | Northing: 6089656 | bearing: | datum: 55H

drilling information					material substance					rock mass defects		
method	core-lift	water	RL	depth metres	graphic log / core recovery	material: rock type; grain characteristics, colour, structure, minor components	weathering / alteration	estimated strength (VL L M H VH EH)	$Is_{(50)}$ MPa D-diametral A-axial	RQD %	defect spacing mm (30 100 300 1000 3000)	defect description: type, inclination, planarity, roughness, coating, thickness — particular / general
NMLC				17		SILTSTONE: Highly weathered, red-brown, siltstone with interbedded extremely weathered silty clayey sand.	HW/XW					
						NO CORE: 100mm	-					
				18		SILTSTONE: Highly weathered, red-brown, siltstone with interbedded extremely weathered silty clayey sand.	HW/XW					
				19								
				20								
				21		BH4 terminated at 20.2m						
				22								
				23								
				24								

method: DT diatube; AS auger screwing; AD auger drilling; RR roller/tricone; CB claw or blade bit; NMLC NMLC core; NQ, HQ, PQ wireline core

core-lift: casing used; barrel withdrawn

graphic log/core recovery: core recovered - graphic symbols indicate material; no core recovered

water: 10/1/98 water level on date shown; water inflow; partial drill fluid loss; complete drill fluid loss; 25 water pressure test result (lugeons) for depth interval shown

weathering: FR fresh; SW slightly weathered; MW moderately weathered; HW highly weathered; XW extremely weathered; DW distinctly weathered (covers MW and HW)

strength: VL very low; L low; M medium; H high; VH very high; EH extremely high

defect type: JT joint; PT parting; SM seam; SZ sheared zone; SS sheared surface; CS crushed seam

planarity: PL planar; CU curved; UN undulating; ST stepped; IR irregular

roughness: VR very rough; RO rough; SO smooth; SL slickensided

coating: CN clean; SN stained; VN veneer; CO coating

CORED BOREHOLE GF9552AA.GPJ COFFEY.GDT 19.6.12

Form GEO 5.5 Issue 3 Rev. 3

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Engineering Log - Borehole

Borehole No. BH5
Sheet 1 of 4
Project No: GEOTFYSH09552AA

Client: Cox Architects
Date started: 2.6.2012
Principal:
Date completed: 2.6.2012
Project: Manuka Oval Redevelopment
Logged by: SB
Borehole Location: TOWER 5 - Refer to Figure 1
Checked by: JT

drill model and mounting: Multidrill 2 Trailer | Easting: 694146 | slope: -90° | R.L. Surface:
hole diameter: 90mm mm | Northing: 6089563 | bearing: | datum: 55H

drilling information							material substance						
method	penetration 1 2 3	support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material: soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetrometer kPa 100 200 300 400	structure and additional observations
ADV		N		E					ASPHALT: 50mm Bitumen seal	D			FILL
									FILL: Gravelly SAND: Fine to coarse grained, pale brown, fine to medium gravel, with a trace of clay.				
				E				CL/CH	Sandy CLAY: Medium to high plasticity, brown, fine to medium grained sand.		St		RESIDUAL SOIL
				E		1		SC	Clayey SAND: Fine to coarse grained, pale grey, medium plasticity clay.		MD/D	600	EXTREMELY WEATHERED MATERIAL
				E SPT 8,11,10 N*=21									
						2		SC	Clayey SAND: Fine to medium grained sand, yellow-brown, medium plasticity, with some fine grained gravel.		VSt/H		HIGHLY WEATHERED MATERIAL
									Borehole BH5 continued as cored hole				
						3							
						4							
						5							
						6							
						7							
						8							

method
AS auger screwing*
AD auger drilling*
RR roller/tricone
W washbore
CT cable tool
HA hand auger
DT diatube
B blank bit
V V bit
T TC bit
*bit shown by suffix
e.g. ADT

support
M mud N nil
C casing

penetration
1 2 3 4
no resistance ranging to refusal

water
10/1/98 water level on date shown
water inflow
water outflow

notes, samples, tests
U_{ex} undisturbed sample 50mm diameter
U_{63} undisturbed sample 63mm diameter
D disturbed sample
N standard penetration test (SPT)
N* SPT - sample recovered
Nc SPT with solid cone
V vane shear (kPa)
P pressuremeter
Bs bulk sample
E environmental sample
R refusal

classification symbols and soil description based on unified classification system

moisture
D dry
M moist
W wet
W_p plastic limit
W_L liquid limit

consistency/density index
VS very soft
S soft
F firm
St stiff
VSt very stiff
H hard
Fb friable
VL very loose
L loose
MD medium dense
D dense
VD very dense

Form GEO 5.3 Issue 3 Rev.2
BOREHOLE GF9552AA.GPJ COFFEY.GDT 19.6.12

coffey geotechnics

Engineering Log - Cored Borehole

Borehole No. BH5
Sheet 3 of 4
Project No: GEOTFYSH09552AA

Client: Cox Architects
Date started: 2.6.2012
Principal:
Date completed: 2.6.2012
Project: Manuka Oval Redevelopment
Logged by: SB
Borehole Location: TOWER 5 - Refer to Figure 1
Checked by: JT

drill model & mounting: Multidrill 2 Trailer | Easting: 694146 | slope: -90° | R.L. Surface:
hole diameter: 90mm mm | drilling fluid: Water | Northing: 6089563 | bearing: | datum: 55H

drilling information						material substance				rock mass defects		
method	core-lift	water	RL	depth metres	graphic log core recovery	material: rock type, grain characteristics, colour, structure, minor components	weathering alteration	estimated strength VL L M H VH EH	$Is_{(50)}$ MPa D- diametral A- axial	RQD %	defect spacing mm 30 100 300 1000 3000	defect description: type, inclination, planarity, roughness, coating, thickness particular / general
				1								
				2								
						Continued from non-cored borehole						
NMLC				3		SILSTONE: Fine grained, yellow-grey, indistinctly bedded.	HW					
				4			MW					JT, 40°, 40mm, PL, RO, SN JT, 100°, 30mm, ST, RO, SN
				5								JT, 20°, 10mm, ST, RO, SN JT, 60°, 60mm, PL, RO, SN JT, 60°, 60mm, PL, RO, SN JT, 60°, 60mm, PL, RO, SN
				6			HW MW					JT, 60°, 60mm, PL, RO, SN Highly fractured zone 300mm JT, 70°, 20mm, PL, RO, SN
				7								JT, 10°, 5mm, PL, RO, SN JT, 70°, 20mm, PL, RO, SN Highly fractured zone 600mm, JT and PT
				8								Highly fractured zone 500mm, JT and PT

method
DT diatube
AS auger screwing
AD auger drilling
RR roller/tricone
CB claw or blade bit
NMLC NMLC core
NQ, HQ, PQ wireline core

core-lift
casing used
barrel withdrawn

graphic log/core recovery
core recovered - graphic symbols indicate material
no core recovered

water
10/1/98 water level on date shown
water inflow
partial drill fluid loss
complete drill fluid loss
25 water pressure test result (lugeons) for depth interval shown

weathering
FR fresh
SW slightly weathered
MW moderately weathered
HW highly weathered
XW extremely weathered
DW distinctly weathered (covers MW and HW)

strength
VL very low
L low
M medium
H high
VH very high
EH extremely high

defect type
JT joint
PT parting
SM seam
SZ sheared zone
SS sheared surface
CS crushed seam

planarity
PL planar
CU curved
UN undulating
ST stepped
IR irregular

roughness
VR very rough
RO rough
SO smooth
SL slickensided

coating
CN clean
SN stained
VN veneer
CO coating

Form GEO 5.5 Issue 3 Rev. 3
CORED BOREHOLE GF9552AA.GPJ COFFEY.GDT 19.6.12

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Engineering Log - Cored Borehole

Borehole No. **BH5**
Sheet 4 of 4
Project No: **GEOTFYSH09552AA**

Client: **Cox Architects**
Principal:
Project: **Manuka Oval Redevelopment**
Borehole Location: **TOWER 5 - Refer to Figure 1**

Date started: **2.6.2012**
Date completed: **2.6.2012**
Logged by: **SB**
Checked by: **JT**

drill model & mounting: Multidrill 2 Trailer | Easting: 694146 | slope: -90° | R.L. Surface:
hole diameter: 90mm mm | Drilling fluid: Water | Northing: 6089563 | bearing: | datum: 55H

drilling information | **material substance** | **rock mass defects**

method	core-lift	water	RL	depth metres	graphic log / core recovery	material: rock type; grain characteristics, colour, structure, minor components	weathering alteration	estimated strength (VL L M H VH EH)	$Is_{(50)}$ MPa D-diametral A-axial	RQD %	defect spacing mm (30 100 300 1000 3000)	defect description: type, inclination, planarity, roughness, coating, thickness — particular	general
NMLC				9		**SILTSTONE:** Fine grained, yellow-grey, indistinctly bedded. *(continued)*	MW / SW					—JT, 10°, 10mm, PL, RO, CO —JT, 10°, 5mm, PL, RO, SN —JT, 20°, 15mm, PL, RO, SN —JTx2, 10°, 10mm, PL, RO, SN	
				10		BH5 terminated at 9.6m							
				11									
				12									
				13									
				14									
				15									
				16									

method
DT diatube; AS auger screwing; AD auger drilling; RR roller/tricone; CB claw or blade bit; NMLC NMLC core; NQ, HQ, PQ wireline core

core-lift
casing used; barrel withdrawn
graphic log/core recovery: core recovered - graphic symbols indicate material; no core recovered

water
10/1/98 water level on date shown; water inflow; partial drill fluid loss; complete drill fluid loss
25 water pressure test result (lugeons) for depth interval shown

weathering
FR fresh; SW slightly weathered; MW moderately weathered; HW highly weathered; XW extremely weathered; DW distinctly weathered (covers MW and HW)

strength
VL very low; L low; M medium; H high; VH very high; EH extremely high

defect type
JT joint; PT parting; SM seam; SZ sheared zone; SS sheared surface; CS crushed seam

roughness
VR very rough; RO rough; SO smooth; SL slickensided

planarity
PL planar; CU curved; UN undulating; ST stepped; IR irregular

coating
CN clean; SN stained; VN veneer; CO coating

Form GEO 5.5 Issue 3 Rev. 3
CORED BOREHOLE GF9552AA.GPJ COFFEY.GDT 19.6.12

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Engineering Log - Borehole

Borehole No. **BH6**
Sheet 1 of 4
Project No: **GEOTFYSH09552AA**

Client: **Cox Architects**
Principal:
Project: **Manuka Oval Redevelopment**
Borehole Location: **TOWER 6 - Refer to Figure 1**

Date started: **30.5.2012**
Date completed: **30.5.2012**
Logged by: **SB**
Checked by: **JT**

drill model and mounting: Multidrill 2 Trailer | Easting: 694081 | slope: -90° | R.L. Surface:
hole diameter: 90mm mm | Northing 6089475 | bearing: | datum: 55H

drilling information | **material substance**

method	penetration 1 2 3	support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material: soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetrometer kPa (100 200 300 400)	structure and additional observations
ADV		C							**FILL: Silty SAND;** Fine to coarse grained, black, low plasticity silt, with some fine grained gravel, rootlets and roadbase material.	D	D		TOPSOIL
				D		1		ML	**Sandy SILT:** Low plasticity, black-brown, fine to medium grained sand.		F		RESIDUAL SOIL
				SPT 3,3,4 N*=7									
				D		2		CL	**Sandy CLAY:** Medium plasticity, black-brown, fine to coarse grained sand.	M	St/VSt		
				SPT 6,11,16 N*=27		3		CL-CH	**Gravelly Sandy CLAY:** Medium to high plasticity, brown, fine to coarse grained sand, fine grained gravel.		VSt	600	
				SPT 3,3,1 N*=4		4			...Soft sand at 4.4m for 200mm, pale grey			600	
				D		5		GP	**Sandy GRAVEL:** Fine to medium grained, grey-yellow, fine to coarse grained sand, with some low plasticity clay.	D	VD		EXTREMELY WEATHERED MATERIAL
						6			Borehole BH6 continued as cored hole				
						7							
						8							

method
AS auger screwing*; AD auger drilling*; RR roller/tricone; W washbore; CT cable tool; HA hand auger; DT diatube; B blank bit; V V bit; T TC bit
*bit shown by suffix e.g. ADT

support
M mud; N nil; C casing
penetration 1 2 3 4: no resistance; ranging to refusal
water
10/1/98 water level on date shown
water inflow; water outflow

notes, samples, tests
U_{50} undisturbed sample 50mm diameter; U_{63} undisturbed sample 63mm diameter; D disturbed sample; N standard penetration test (SPT); N* SPT - sample recovered; Nc SPT with solid cone; V vane shear (kPa); P pressuremeter; Bs bulk sample; E environmental sample; R refusal

classification symbols and soil description
based on unified classification system

moisture
D dry; M moist; W wet; Wp plastic limit; W_L liquid limit

consistency/density index
VS very soft; S soft; F firm; St stiff; VSt very stiff; H hard; Fb friable; VL very loose; L loose; MD medium dense; D dense; VD very dense

Form GEO 5.3 Issue 3 Rev. 2
BOREHOLE GF9552AA.GPJ COFFEY.GDT 19.6.12

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Engineering Log - Cored Borehole

Borehole No. BH6
Sheet 3 of 4
Project No: GEOTFYSH09552AA

Client: Cox Architects
Principal:
Project: Manuka Oval Redevelopment
Borehole Location: TOWER 6 - Refer to Figure 1

Date started: 30.5.2012
Date completed: 30.5.2012
Logged by: SB
Checked by: JT

drill model & mounting: Multidrill 2 Trailer | Easting: 694081 | slope: -90° | R.L. Surface:
hole diameter: 90mm mm | drilling fluid: Water | Northing: 6089475 | bearing: | datum: 55H

drilling information					material substance					rock mass defects		
method	core-lift	water	RL	depth metres	graphic log core recovery	material: rock type; grain characteristics, colour, structure, minor components	weathering alteration	estimated strength VL L M H VH EH	$Is_{(50)}$ MPa D- diametral A- axial	RQD %	defect spacing mm 30 100 300 1000 3000	defect description: type, inclination, planarity, roughness, coating, thickness — particular / general
				1								
				2								
				3								
				4								
				5								
						Continued from non-cored borehole						
NMLC				6		SILSTONE: Fine grained, yellow-grey, indistinctly bedded.	HW					—JT, 10°, 10mm, PL, RO, SN
				7		SILSTONE: Fine grained, grey, indistinctly bedded.	MW					—JT, 30°, 20mm, PL, RO, SN —JT, 10°, 10mm, IR, RO, SN —JT, 10°, 10mm, PL, RO, SN —JT, 45°, 30mm, PL, RO, SN —JT, 10°, 10mm, PL, RO, SN —JT, 10°, 10mm, PL, RO, SN
				8								

method: DT diatube; AS auger screwing; AD auger drilling; RR roller/tricone; CB claw or blade bit; NMLC NMLC core; NQ, HQ, PQ wireline core
core-lift: casing used; barrel withdrawn
graphic log/core recovery: core recovered - graphic symbols indicate material; no core recovered
water: 10/1/98 water level on date shown; water inflow; partial drill fluid loss; complete drill fluid loss; 25 water pressure test result (lugeons) for depth interval shown
weathering: FR fresh; SW slightly weathered; MW moderately weathered; HW highly weathered; XW extremely weathered; DW distinctly weathered (covers MW and HW)
strength: VL very low; L low; M medium; H high; VH very high; EH extremely high
defect type: JT joint; PT parting; SM seam; SZ sheared zone; SS sheared surface; CS crushed seam
planarity: PL planar; CU curved; UN undulating; ST stepped; IR irregular
roughness: VR very rough; RO rough; SO smooth; SL slickensided
coating: CN clean; SN stained; VN veneer; CO coating

Form GEO 5.5 Issue 3 Rev. 3
CORED BOREHOLE GF9552AA.GPJ COFFEY.GDT 19.6.12

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Engineering Log - Cored Borehole

Borehole No. BH6
Sheet 4 of 4
Project No: GEOTFYSH09552AA

Client: Cox Architects
Principal:
Project: Manuka Oval Redevelopment
Borehole Location: TOWER 6 - Refer to Figure 1

Date started: 30.5.2012
Date completed: 30.5.2012
Logged by: SB
Checked by: JT

drill model & mounting: Multidrill 2 Trailer | Easting: 694081 | slope: -90° | R.L. Surface:
hole diameter: 90mm mm | drilling fluid: Water | Northing: 6089475 | bearing: | datum: 55H

drilling information					material substance					rock mass defects		
method	core-lift	water	RL	depth metres	graphic log core recovery	material: rock type; grain characteristics, colour, structure, minor components	weathering alteration	estimated strength VL L M H VH EH	$Is_{(50)}$ MPa D- diametral A- axial	RQD %	defect spacing mm 30 100 300 1000 3000	defect description: type, inclination, planarity, roughness, coating, thickness — particular / general
NMLC				9		SILSTONE: Fine grained, grey, indistinctly bedded. *(continued)*	MW					—Highly weathered zone 100mm —JT, 10°, 10mm, PL, RO, SN
				10			SW					JT, 30°, 20mm, PL, RO, CO JT, 30°, 20mm, PL, RO, CO JT, 10°, 10mm, PL, RO, SN JT, 10°, 10mm, PL, RO, VN JT, 45°, 20mm, PL, RO, VN JT, 45°, 20mm, PL, RO, VN JT, 45°, 20mm, PL, RO, VN JT, 10°, 20mm, IR, RO, SN JT, 10°, 10mm, PL, RO, SN JT, 10°, 10mm, PL, RO, SN JT, 30°, 30mm, PL, RO, SN JT, 20°, 20mm, PL, RO, SN JT, 20°, 20mm, PL, RO, SN JT, 20°, 20mm, PL, RO, SN JT, 20°, 20mm, PL, RO, SN
				11		BH6 terminated at 10.4m						
				12								
				13								
				14								
				15								
				16								

method: DT diatube; AS auger screwing; AD auger drilling; RR roller/tricone; CB claw or blade bit; NMLC NMLC core; NQ, HQ, PQ wireline core
core-lift: casing used; barrel withdrawn
graphic log/core recovery: core recovered - graphic symbols indicate material; no core recovered
water: 10/1/98 water level on date shown; water inflow; partial drill fluid loss; complete drill fluid loss; 25 water pressure test result (lugeons) for depth interval shown
weathering: FR fresh; SW slightly weathered; MW moderately weathered; HW highly weathered; XW extremely weathered; DW distinctly weathered (covers MW and HW)
strength: VL very low; L low; M medium; H high; VH very high; EH extremely high
defect type: JT joint; PT parting; SM seam; SZ sheared zone; SS sheared surface; CS crushed seam
planarity: PL planar; CU curved; UN undulating; ST stepped; IR irregular
roughness: VR very rough; RO rough; SO smooth; SL slickensided
coating: CN clean; SN stained; VN veneer; CO coating

Form GEO 5.5 Issue 3 Rev. 3
CORED BOREHOLE GF9552AA.GPJ COFFEY.GDT 19.6.12

coffey geotechnics

Engineering Log - Borehole

Borehole No.	BH-P1		
Sheet	1 of 1		
Project No:	GEOTFYSH09552AA		
Client:	Cox Architects	Date started:	1.6.2012
Principal:		Date completed:	1.6.2012
Project:	Manuka Oval Redevelopment	Logged by:	SB
Borehole Location:	Refer to Figure 1	Checked by:	JT

drill model and mounting: Multidrill 2 Trailer | Easting: 694132 | slope: -90° | R.L. Surface:
hole diameter: 90mm mm | Northing: 6089599 | bearing: | datum: 55H

drilling information | **material substance**

method	penetration 1 2 3	support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material: soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetro-meter kPa 100 200 300 400	structure and additional observations
ADV		N		E					FILL: Sandy GRAVEL: Fine to coarse grained, red, fine to medium grained gravel.	D			FILL (CRUSHED GRANITE)
									FILL: Clayey Silty SAND: Fine to coarse grained, pale black, low to medium plasticity clay.				FILL
				SPT 4,4,5 N*=9		1			FILL: Gravelly Clayey Silty SAND: Fine to coarse grained, pale black/grey, medium plasticity clay, fine to coarse grained gravel.	M			
									FILL: Sandy CLAY: High plasticity, black/brown, fine to medium grained sand.			600	
				D		2			FILL: Clayey SILT: Black, low plasticity clay, organics present.	D			
				SPT 5,6,6 N*=12		3		CL	Sandy CLAY: Medium plasticity, red-brown, fine to coarse grained sand.		St		RESIDUAL SOIL
								CL	Sandy CLAY/Clayey SAND: Fine to coarse grained sand, medium plasticity clay, with a trace of fine gravel.		St/VSt	600	
				SPT 5,6,8 N*=14		4							
						5							
						6			Borehole BH-P1 terminated at 5.7m				
						7							
						8							

method
AS auger screwing*
AD auger drilling*
RR roller/tricone
W washbore
CT cable tool
HA hand auger
DT diatube
B blank bit
V V bit
T TC bit
*bit shown by suffix
e.g. ADT

support
M mud N nil
C casing
penetration 1 2 3 4 — no resistance ranging to refusal
water
10/1/98 water level on date shown
water inflow
water outflow

notes, samples, tests
U_{50} undisturbed sample 50mm diameter
U_{63} undisturbed sample 63mm diameter
D disturbed sample
N standard penetration test (SPT)
N* SPT - sample recovered
Nc SPT with solid cone
V vane shear (kPa)
P pressuremeter
Bs bulk sample
E environmental sample
R refusal

classification symbols and soil description based on unified classification system

moisture
D dry
M moist
W wet
Wp plastic limit
W_L liquid limit

consistency/density index
VS very soft
S soft
F firm
St stiff
VSt very stiff
H hard
Fb friable
VL very loose
L loose
MD medium dense
D dense
VD very dense

Form GEO 5.3 Issue 3 Rev 2
BOREHOLE GF9552AA.GPJ COFFEY.GDT 19.6.12

Engineering Log - Cored Borehole

Borehole No.	BH-P1		
Sheet	1 of 1		
Project No:	GEOTFYSH09552AA		
Client:	Cox Architects	Date started:	1.6.2012
Principal:		Date completed:	1.6.2012
Project:	Manuka Oval Redevelopment	Logged by:	SB
Borehole Location:	Refer to Figure 1	Checked by:	JT

drill model & mounting: Multidrill 2 Trailer | Easting: 694132 | slope: -90° | R.L. Surface:
hole diameter: 90mm mm | drilling fluid: Water | Northing: 6089599 | bearing: | datum: 55H

drilling information | **material substance** | **rock mass defects**

method	core-lift	water	RL	depth metres	graphic log / core recovery	material: rock type; grain characteristics, colour, structure, minor components	weathering alteration	estimated strength VL L M H VH EH	$Is_{(50)}$ MPa D- diametral A- axial	RQD %	defect spacing mm 30 100 300 1000 3000	defect description: type, inclination, planarity, roughness, coating, thickness — particular / general
ADV						FILL: Sandy GRAVEL: Fine to coarse grained, red, fine to medium grained gravel.						
						FILL: Clayey Silty SAND: Fine to coarse grained, pale black, low to medium plasticity clay.						
				1		FILL: Gravelly Clayey Silty SAND: Fine to coarse grained, pale black/grey, medium plasticity clay, fine to coarse grained gravel.						
						FILL: Sandy CLAY: High plasticity, black/brown, fine to medium grained sand.						
				2		FILL: Clayey SILT: Black, low plasticity clay, organics present.						
				3		Sandy CLAY: Medium plasticity, red-brown, fine to coarse grained sand.						
				4		Sandy CLAY/Clayey SAND: Fine to coarse grained sand, medium plasticity clay, with a trace of fine gravel.						
				5								
				6		BH-P1 terminated at 5.7m						
				7								
				8								

method
DT diatube
AS auger screwing
AD auger drilling
RR roller/tricone
CB claw or blade bit
NMLC NMLC core
NQ, HQ, PQ wireline core

core-lift
casing used
barrel withdrawn
graphic log/core recovery
core recovered - graphic symbols indicate material
no core recovered

water
10/1/98 water level on date shown
water inflow
partial drill fluid loss
complete drill fluid loss
25 water pressure test result (lugeons) for depth interval shown

weathering
FR fresh
SW slightly weathered
MW moderately weathered
HW highly weathered
XW extremely weathered
DW distinctly weathered (covers MW and HW)

strength
VL very low
L low
M medium
H high
VH very high
EH extremely high

defect type
JT joint
PT parting
SM seam
SZ sheared zone
SS sheared surface
CS crushed seam

planarity
PL planar
CU curved
UN undulating
ST stepped
IR irregular

roughness
VR very rough
RO rough
SO smooth
SL slickensided

coating
CN clean
SN stained
VN veneer
CO coating

Form GEO 5.5 Issue 3 Rev. 3
CORED BOREHOLE GF9552AA.GPJ COFFEY.GDT 19.6.12

coffey geotechnics

Engineering Log - Borehole

Client:	*Cox Architects*	Borehole No.	*BH-P2*
Principal:		Sheet	1 of 1
Project:	*Manuka Oval Redevelopment*	Project No:	*GEOTFYSH09552AA*
Borehole Location:	*Refer to Figure 1*	Date started:	*1.6.2012*
		Date completed:	*1.6.2012*
		Logged by:	*SB*
		Checked by:	*JT*

drill model and mounting: Multidrill 2 Trailer | Easting: 694105 | slope: -90° | R.L. Surface:
hole diameter: 90mm mm | Northing 6089514 | bearing: | datum: 55H

drilling information | **material substance**

method	penetration 1 2 3	support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material: soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetro-meter kPa 100 200 300 400	structure and additional observations
ADV		N		E					FILL: Sandy GRAVEL: Fine to medium gravel, red, fine to coarse grained sand.	D			FILL (CRUSHED GRANITE)
				E					FILL: Clayey Silty SAND: Fine to coarse grained, pale black, low to medium plasticity clay.				FILL
				SPT 6,8,12 N*=20		1							
						2							
				SPT 6,6,6 N*=12		3		SC	Clayey SAND: Fine to coarse grained, red-brown, medium plasticity clay.		VD		EXTREMELY WEATHERED MATERIAL
									Borehole BH-P2 terminated at 3m				
						4							
						5							
						6							
						7							
						8							

method
AS auger screwing* | AD auger drilling* | RR roller/Incone | W washbore | CT cable tool | HA hand auger | DT diatube | B blank bit | V V bit | T TC bit | *bit shown by suffix | e.g. ADT

support
M mud | N nil | C casing
penetration 1 2 3 4 — no resistance ranging to refusal
water: 10/1/98 water level on date shown | water inflow | water outflow

notes, samples, tests
U_{50} undisturbed sample 50mm diameter | U_{63} undisturbed sample 63mm diameter | D disturbed sample | N standard penetration test (SPT) | N* SPT - sample recovered | Nc SPT with solid cone | V vane shear (kPa) | P pressuremeter | Bs bulk sample | E environmental sample | R refusal

classification symbols and soil description
based on unified classification system

moisture
D dry | M moist | W wet | Wp plastic limit | W_L liquid limit

consistency/density index
VS very soft | S soft | F firm | St stiff | VSt very stiff | H hard | Fb friable | VL very loose | L loose | MD medium dense | D dense | VD very dense

BOREHOLE GF9552AA.GPJ COFFEY.GDT 19.6.12
Form GEO 5.3 Issue 3 Rev.2

coffey geotechnics

Engineering Log - Borehole

Client:	*Cox Architects*	Borehole No.	*BH-H1*
Principal:		Sheet	1 of 1
Project:	*Manuka Oval Redevelopment*	Project No:	*GEOTFYSH09552AA*
Borehole Location:	*Refer to Figure 1*	Date started:	*1.6.2012*
		Date completed:	*1.6.2012*
		Logged by:	*SB*
		Checked by:	*JT*

drill model and mounting: Multidrill 2 Trailer | Easting: 693967 | slope: -90° | R.L. Surface:
hole diameter: 90mm mm | Northing 6089652 | bearing: | datum: 55H

drilling information | **material substance**

method	penetration 1 2 3	support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material: soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetro-meter kPa 100 200 300 400	structure and additional observations
ADV		N		E					ASPHALT: 50mm	D	D		FILL
									FILL: Sandy GRAVEL		F		TOPSOIL
								CL	TOPSOIL: Sandy SILT: Low plasticity, pale black, fine to coarse grained sand, with some rootlets.		St/VSt		RESIDUAL SOIL
				SPT 5,9,11 N*=20					Sandy CLAY: Medium plasticity, pale brown-red, fine to medium grained sand.				600
				E		1		SC	Clayey SAND: Fine to coarse grained, red-brown, medium plasticity clay, with a trace of fine gravel.		H		EXTREMELY WEATHERED MATERIAL
						2							
									Borehole BH-H1 terminated at 2.2m				
						3							
						4							
						5							
						6							
						7							
						8							

method
AS auger screwing* | AD auger drilling* | RR roller/Incone | W washbore | CT cable tool | HA hand auger | DT diatube | B blank bit | V V bit | T TC bit | *bit shown by suffix | e.g. ADT

support
M mud | N nil | C casing
penetration 1 2 3 4 — no resistance ranging to refusal
water: 10/1/98 water level on date shown | water inflow | water outflow

notes, samples, tests
U_{50} undisturbed sample 50mm diameter | U_{63} undisturbed sample 63mm diameter | D disturbed sample | N standard penetration test (SPT) | N* SPT - sample recovered | Nc SPT with solid cone | V vane shear (kPa) | P pressuremeter | Bs bulk sample | E environmental sample | R refusal

classification symbols and soil description
based on unified classification system

moisture
D dry | M moist | W wet | Wp plastic limit | W_L liquid limit

consistency/density index
VS very soft | S soft | F firm | St stiff | VSt very stiff | H hard | Fb friable | VL very loose | L loose | MD medium dense | D dense | VD very dense

BOREHOLE GF9552AA.GPJ COFFEY.GDT 19.6.12
Form GEO 5.3 Issue 3 Rev.2

coffey geotechnics

Engineering Log - Cored Borehole

Borehole No. **BH-H1**
Sheet 1 of 1
Project No: **GEOTFYSH09552AA**

Client: **Cox Architects**
Date started: **1.6.2012**
Principal:
Date completed: **1.6.2012**
Project: **Manuka Oval Redevelopment**
Logged by: **SB**
Borehole Location: **Refer to Figure 1**
Checked by: **JT**

drill model & mounting: Multidrill 2 Trailer | Easting: 693967 | slope: -90° | R.L. Surface:
hole diameter: 90mm mm | drilling fluid: Water | Northing: 6089652 | bearing: | datum: 55H

drilling information | **material substance** | **rock mass defects**

method	core-lift	water	RL	depth metres	graphic log / core recovery	material: rock type; grain characteristics, colour, structure, minor components	weathering / alteration	estimated strength (VL L M H VH EH)	$Is_{(50)}$ MPa D-diametral A-axial	RQD %	defect spacing mm (30 100 300 1000 3000)	defect description: type, inclination, planarity, roughness, coating, thickness — particular / general
ADV				1		ASPHALT: 50mm FILL: Sandy GRAVEL TOPSOIL: Sandy SILT: Low plasticity, pale black, fine to coarse grained sand, with some rootlets.						
				2		Sandy CLAY: Medium plasticity, pale brown-red, fine to medium grained sand. Clayey SAND: Fine to coarse grained, red-brown, medium plasticity clay, with a trace of fine gravel.						
				3		BH-H1 terminated at 2.2m						
				4								
				5								
				6								
				7								
				8								

method: DT diatube; AS auger screwing; AD auger drilling; RR roller/tricone; CB claw or blade bit; NMLC NMLC core; NQ, HQ, PQ wireline core

core-lift: casing used; barrel withdrawn

graphic log/core recovery: core recovered - graphic symbols indicate material; no core recovered

water: 10/1/98 water level on date shown; water inflow; partial drill fluid loss; complete drill fluid loss; 25 water pressure test result (lugeons) for depth interval shown

weathering: FR fresh; SW slightly weathered; MW moderately weathered; HW highly weathered; XW extremely weathered; DW distinctly weathered (covers MW and HW)

strength: VL very low; L low; M medium; H high; VH very high; EH extremely high

defect type: JT joint; PT parting; SM seam; SZ sheared zone; SS sheared surface; CS crushed seam

planarity: PL planar; CU curved; UN undulating; ST stepped; IR irregular

roughness: VR very rough; RO rough; SO smooth; SL slickensided

coating: CN clean; SN stained; VN veneer; CO coating

Form GEO 5.5 Issue 3 Rev. 3
CORED BOREHOLE GF9552AA.GPJ COFFEY.GDT 19.6.12

coffey geotechnics

Engineering Log - Borehole

Borehole No. **BH-M1**
Sheet 1 of 1
Project No: **GEOTFYSH09552AA**

Client: **Cox Architects**
Date started: **1.6.2012**
Principal:
Date completed: **1.6.2012**
Project: **Manuka Oval Redevelopment**
Logged by: **SB**
Borehole Location: **Refer to Figure 1**
Checked by: **JT**

drill model and mounting: Multidrill 2 Trailer | Easting: 693947 | slope: -90° | R.L. Surface:
hole diameter: 90mm mm | Northing 6089552 | bearing: | datum: 55H

drilling information | **material substance**

method	penetration (1 2 3)	support	water	notes, samples, tests, etc	RL	depth metres	graphic log	classification symbol	material: soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency / density index	pocket penetrometer kPa (100 200 300 400)	structure and additional observations
ADV		N		E		1			ASPHALT: 50mm	D			FILL
								CL	FILL: Sandy GRAVEL: Fine to coarse gravel, grey, fine to coarse grained sand.		D	600	RESIDUAL SOIL
				E					Sandy CLAY: Medium plasticity, red/brown, fine to coarse grained sand.				
				E									
				SPT 6,20/130 N=R				SC	Clayey SAND: Fine to coarse grained, red/brown with some grey, medium plasticity clay.		VSt/H	600	EXTREMELY WEATHERED MATERIAL
						2			Borehole BH-M1 terminated at 1.5m				
						3							
						4							
						5							
						6							
						7							
						8							

method: AS auger screwing*; AD auger drilling*; RR roller/tricone; W washbore; CT cable tool; HA hand auger; DT diatube; B blank bit; V V bit; T TC bit; *bit shown by suffix e.g. ADT

support: M mud; C casing; N nil

penetration: 1 2 3 4 — no resistance ranging to refusal

water: 10/1/98 water level on date shown; water inflow; water outflow

notes, samples, tests: U_{50} undisturbed sample 50mm diameter; U_{63} undisturbed sample 63mm diameter; D disturbed sample; N standard penetration test (SPT); N* SPT - sample recovered; Nc SPT with solid cone; V vane shear (kPa); P pressuremeter; Bs bulk sample; E environmental sample; R refusal

classification symbols and soil description based on unified classification system

moisture: D dry; M moist; W wet; Wp plastic limit; W_L liquid limit

consistency/density index: VS very soft; S soft; F firm; St stiff; VSt very stiff; H hard; Fb friable; VL very loose; L loose; MD medium dense; D dense; VD very dense

Form GEO 5.3 Issue 3 Rev. 2
BOREHOLE GF9552AA.GPJ COFFEY.GDT 19.6.12

coffey geotechnics

Engineering Log - Cored Borehole

Client: *Cox Architects*

Principal:

Project: *Manuka Oval Redevelopment*

Borehole Location: *Refer to Figure 1*

Borehole No. *BH-M1*

Sheet 1 of 1

Project No: *GEOTFYSH09552AA*

Date started: *1.6.2012*

Date completed: *1.6.2012*

Logged by: *SB*

Checked by: *JT*

drill model & mounting: Multidrill 2 Trailer | Easting: 693947 | slope: -90° | R.L. Surface:

hole diameter: 90mm mrDrilling fluid: Water | Northing: 6089552 | bearing: | datum: 55H

drilling information					material substance				rock mass defects		
method	core-lift	water	RL	depth metres	graphic log / core recovery	material: rock type, grain characteristics, colour, structure, minor components	weathering alteration	estimated strength	$Is_{(50)}$ MPa D-diam-etral A-axial	RQD %	defect spacing mm	defect description: type, inclination, planarity, roughness, coating, thickness (particular / general)
ADV				1		ASPHALT: 50mm FILL: Sandy GRAVEL: Fine to coarse gravel, grey, fine to coarse grained sand. Sandy CLAY: Medium plasticity, red/brown, fine to coarse grained sand.						
				2		Clayey SAND: Fine to coarse grained, red/brown with some grey, medium plasticity clay. BH-M1 terminated at 1.5m						
				3								
				4								
				5								
				6								
				7								
				8								

DRAFT Coffey

method: DT diatube; AS auger screwing; AD auger drilling; RR roller/tricone; CB claw or blade bit; NMLC NMLC core; NQ, HQ, PQ wireline core

core-lift: casing used; barrel withdrawn; graphic log/core recovery: core recovered - graphic symbols indicate material; no core recovered

water: 10/1/98 water level on date shown; water inflow; partial drill fluid loss; complete drill fluid loss; 25 water pressure test result (lugeons) for depth interval shown

weathering: FR fresh; SW slightly weathered; MW moderately weathered; HW highly weathered; XW extremely weathered; DW distinctly weathered (covers MW and HW)

strength: VL very low; L low; M medium; H high; VH very high; EH extremely high

defect type: JT joint; PT parting; SM seam; SZ sheared zone; SS sheared surface; CS crushed seam

planarity: PL planar; CU curved; UN undulating; ST stepped; IR irregular

roughness: VR very rough; RO rough; SO smooth; SL slickensided

coating: CN clean; SN stained; VN veneer; CO coating

CORED BOREHOLE GF9552AA.GPJ COFFEY.GDT 19.6.12

Form GEO 5.5 Issue 3 Rev. 3

coffey geotechnics

Engineering Log - Cored Borehole

Client: *Cox Architects*

Principal:

Project: *Manuka Oval Redevelopment*

Borehole Location: *Refer to Figure 1*

Borehole No. *BH-P2*

Sheel 1 of 1

Project No: *GEOTFYSH09552AA*

Date started: *1.6.2012*

Date completed: *1.6.2012*

Logged by: *SB*

Checked by: *JT*

drill model & mounting: Multidrill 2 Trailer | Easting: 694105 | slope: -90° | R.L. Surface:

hole diameter: 90mm mrDrilling fluid: Water | Northing: 6089514 | bearing: | datum: 55H

drilling information					material substance				rock mass defects		
method	core-lift	water	RL	depth metres	graphic log / core recovery	material: rock type, grain characteristics, colour, structure, minor components	weathering alteration	estimated strength	$Is_{(50)}$ MPa D-diam-etral A-axial	RQD %	defect spacing mm	defect description: type, inclination, planarity, roughness, coating, thickness (particular / general)
ADV				1		FILL: Sandy GRAVEL: Fine to medium gravel, red, fine to coarse grained sand. FILL: Clayey Silty SAND: Fine to coarse grained, pale black, low to medium plasticity clay.						
				2								
				3		Clayey SAND: Fine to coarse grained, red-brown, medium plasticity clay. BH-P2 terminated at 3m						
				4								
				5								
				6								
				7								
				8								

DRAFT Coffey

method: DT diatube; AS auger screwing; AD auger drilling; RR roller/tricone; CB claw or blade bit; NMLC NMLC core; NQ, HQ, PQ wireline core

core-lift: casing used; barrel withdrawn; graphic log/core recovery: core recovered - graphic symbols indicate material; no core recovered

water: 10/1/98 water level on date shown; water inflow; partial drill fluid loss; complete drill fluid loss; 25 water pressure test result (lugeons) for depth interval shown

weathering: FR fresh; SW slightly weathered; MW moderately weathered; HW highly weathered; XW extremely weathered; DW distinctly weathered (covers MW and HW)

strength: VL very low; L low; M medium; H high; VH very high; EH extremely high

defect type: JT joint; PT parting; SM seam; SZ sheared zone; SS sheared surface; CS crushed seam

planarity: PL planar; CU curved; UN undulating; ST stepped; IR irregular

roughness: VR very rough; RO rough; SO smooth; SL slickensided

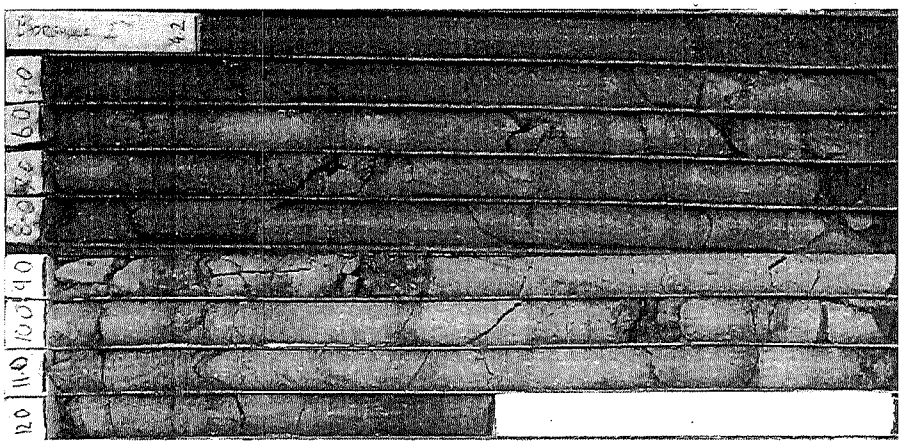
coating: CN clean; SN stained; VN veneer; CO coating

CORED BOREHOLE GF9552AA.GPJ COFFEY.GDT 19.6.12

Form GEO 5.5 Issue 3 Rev. 3

coffey geotechnics
SPECIALISTS MANAGING THE EARTH

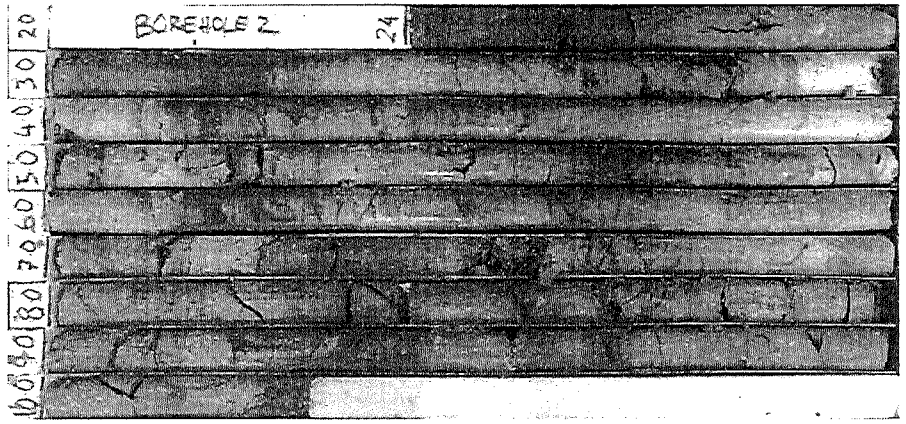
PROJECT: Manuka Oval Redevelopment
PROJECT No: GEOTFYSH09552AA
BOREHOLE No: 1 DATE: 30/5/2012
DEPTH: 4.2 m TO 12.5 m



drawn	SB	coffey geotechnics SPECIALISTS MANAGING THE EARTH	client:	COX Architects
approved	JT		project:	MANUKA OVAL REDEVELOPMENT
date	7/6/2012		title:	CORE PHOTOGRAPH – BH1
scale	Not to scale		project no: GEOTFYSH09552AA-01	Photo no: 1 of 1
original size	A4			

coffey geotechnics
SPECIALISTS MANAGING THE EARTH

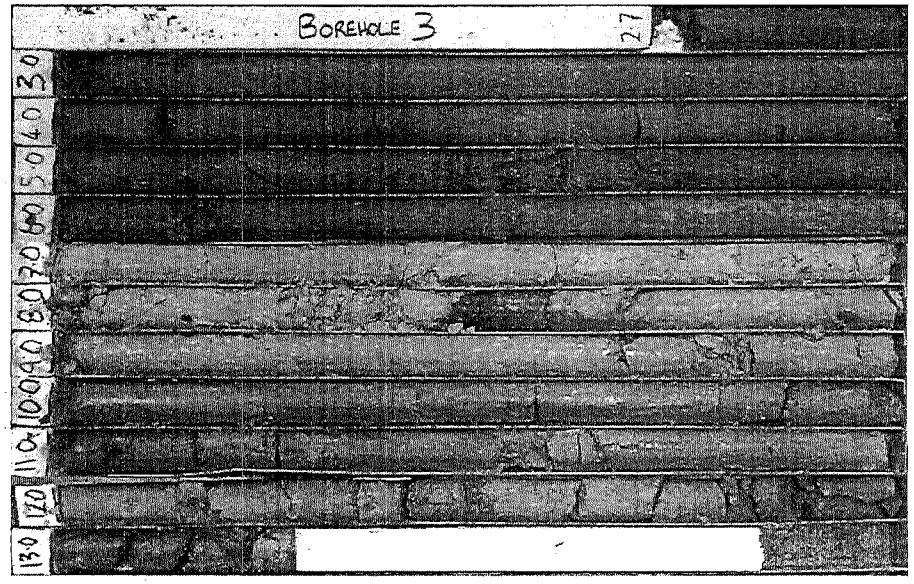
PROJECT: Manuka Oval Redevelopment
PROJECT No: GEOTFYSH09552AA
BOREHOLE No: 2 DATE: 1/6/2012
DEPTH: 2.4 m TO 10.2 m



drawn	SB	coffey geotechnics SPECIALISTS MANAGING THE EARTH	client:	COX Architects
approved	JT		project:	MANUKA OVAL REDEVELOPMENT
date	7/6/2012		title:	CORE PHOTOGRAPH – BH2
scale	Not to scale		project no: GEOTFYSH09552AA-01	Photo no: 1 of 1
original size	A4			

coffey geotechnics
SPECIALISTS MANAGING THE EARTH

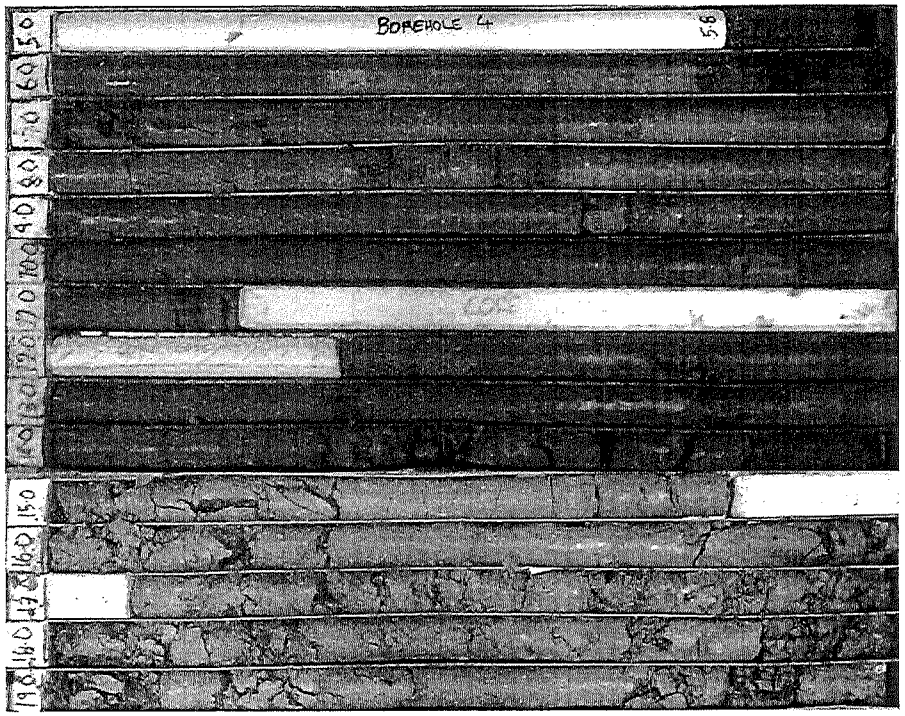
PROJECT: Manuka Oval Redevelopment
PROJECT No: GEOTFYSH09552AA
BOREHOLE No: 3 DATE: 1/6/2012
DEPTH: 2.7 m TO 13.2 m



drawn	SB	coffey geotechnics SPECIALISTS MANAGING THE EARTH	client:	COX Architects
approved	JT		project:	MANUKA OVAL REDEVELOPMENT
date	7/6/2012		title:	CORE PHOTOGRAPH – BH3
scale	Not to scale		project no. GEOTFYSH09552AA-01	Photo no: 1 of 1
original size	A4			

coffey geotechnics
SPECIALISTS MANAGING THE EARTH

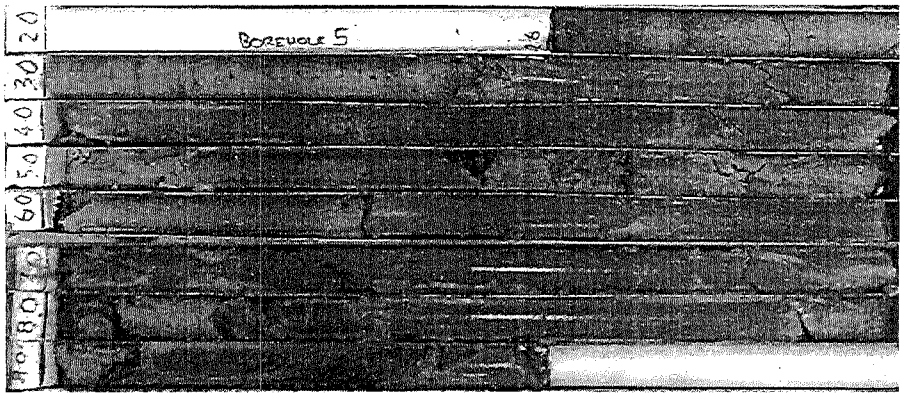
PROJECT: Manuka Oval Redevelopment
PROJECT No: GEOTFYSH09552AA
BOREHOLE No: 4 DATE: 1/6/2012
DEPTH: 5.8 m TO 20.0 m



drawn	SB	coffey geotechnics SPECIALISTS MANAGING THE EARTH	client:	COX Architects
approved	JT		project:	MANUKA OVAL REDEVELOPMENT
date	7/6/2012		title:	CORE PHOTOGRAPH – BH4
scale	Not to scale		project no: GEOTFYSH09552AA-01	Photo no: 1 of 1
original size	A4			

coffey geotechnics
SPECIALISTS MANAGING THE EARTH

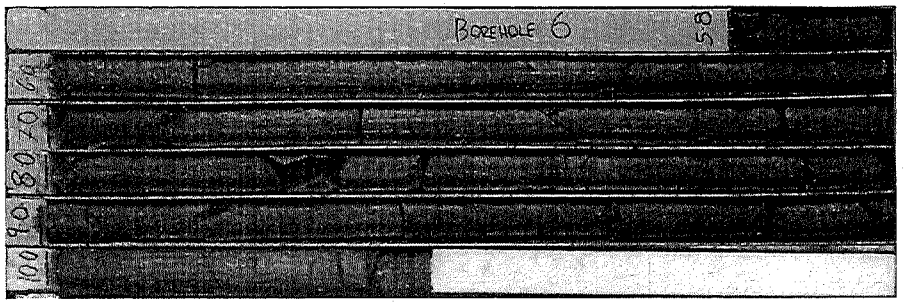
PROJECT: Manuka Oval Redevelopment
PROJECT No: GEOTFYSH09552AA
BOREHOLE No: 5 DATE: 2/6/2012
DEPTH: 2.6 m TO 9.7 m



drawn	SB	coffey geotechnics SPECIALISTS MANAGING THE EARTH	client:	COX Architects
approved	JT		project:	MANUKA OVAL REDEVELOPMENT
date	7/6/2012		title:	CORE PHOTOGRAPH – BH5
scale	Not to scale		project no: GEOTFYSH09552AA-01	Photo no: 1 of 1
original size	A4			

coffey geotechnics
SPECIALISTS MANAGING THE EARTH

PROJECT: Manuka Oval Redevelopment
PROJECT No: GEOTFYSH09552AA
BOREHOLE No: 6 DATE: 31/5/2012
DEPTH: 5.8 m TO 10.4 m



drawn	SB	coffey geotechnics SPECIALISTS MANAGING THE EARTH	client:	COX Architects
approved	JT		project:	MANUKA OVAL REDEVELOPMENT
date	30/5/2012		title:	CORE PHOTOGRAPH – BH6
scale	Not to scale		project no: GEOTFYSH09552AA-01	Photo no: 1 of 1
original size	A4			

Appendix B

Laboratory Test Results

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

339911

94280

coffey environments

ACT: 47 Torrens St, Braddon ACT 2612 ... Tel (02) 6162 2622 ... Fax (02) 6162 0494
NSW: Level 1, 3 Rider Blvd, Rhodes NSW 2138 ... Tel (02) 8083 1600 ... Fax (02) 8765 0762
Lot 101, 19 Warabrook Blvd, Warabrook NSW 2304 ... Tel (02) 4015 2300 ... Fax (02) 4015 2380
118 Auburn St, Wollongong NSW 2500 ... Tel (02) 4201 1460 ... Fax (02) 4201 1491
NT: Level 7, 80 Mitchell St, Darwin NT 0800 ... Tel (08) 8901 1200 ... Fax (08) 8901 1299
QLD: Level 21, 12 Creek St, Brisbane QLD 4000 ... Tel (07) 3002 0400 ... Fax (07) 3002 0444
47 Doggett St, Newstead QLD 4006 ... Tel (07) 3608 2500 ... Fax (07) 3852 2805
SA: Wonderpark, Level 1, 33 Richmond Rd, Keswick SA 5035 ... Tel (08) 8376 4400 ... Fax (08) 8376 4499
TAS: Coffey Business Centre, 2 Melville St, Hobart TAS 7000 ... Tel (03) 6100 0100 ... Fax (03) 6100 0199
VIC: 126 Tranarry Cres, Abbotsford VIC 3067 ... Tel (03) 9473 1400 ... Fax (03) 9473 1450
Level 1, 23 West Fyans St, Newtown VIC 3220 ... Tel (03) 5215 4600 ... Fax (03) 5224 1368
WA: 61 Duke St, Albany WA 6330 ... Tel (08) 9892 6400 ... Fax (08) 9892 6444
Suite 2, 53 Burswood Rd, Burswood WA 6100 ... Tel (08) 9355 7100 ... Fax (08) 9355 7111
Unit 6/7,31 Dunn Bay Rd, Dunsborough WA 6281 ... Tel (08) 9756 9500 ... Fax (08) 9756 9501

Project No: GEOTFYSH09552AA Task No:

Project Name: MANUKA OVAL REDEVELOPMENT Laboratory: MGT

Samplers Name: STEPHEN BUCK Project Manager: JON THOMPSON

Special Instructions:

Analysis Request Section

Lab. No.	Sample ID	Sample Location	Sample Depth	Sample Date	Time	Matrix (Soil ... etc)	Container Type & Preservative*	T-A-T (Specify)	BTEX / TPH / Pb	METALS (Specify)	PAHs / PHENOLS	OCs / OPs	Asbestos	Lead in Paint	Salinity	pH	Sulphate	Chloride	Conductivity	NOTES
12-[illegible]117	1	BH1	3.0-3.2	30/5/12	11AM	Soil	BAG	1 week												
	2	BH1	3.7-3.9		1PM															
	3	BH2	2.0-2.2		8AM															
	4	BH3	1.7-1.9		9AM															
	5	BH4	0.5-0.7	1/6/12	12PM															
	6	BH4	2.9-3.1		2PM															
	7	BH5	0.8-1.0	2/6/12	8AM															
	8	BH6	1.7-2.0	1/6/12	4PM															
	9	BH6	5.2-5.5	1/6/12	5PM															
12-[illegible]126	10	BH4	1.7-2.0	1/6/12	1PM															

RELINQUISHED BY:		RECEIVED BY:	
Signature:	Date: 5/6/12	Signature:	Date: 6/6/12
Company: Coffey Geot	Time: 11AM.	Company: MGT Molonglo	Time: 09:00
Signature:	Date:	Signature:	Date:
Company:	Time:	Company:	Time:

Sample Receipt Advice: *(Lab Use Only)*

All Samples Received in Good Condition . . . ☐
All Documentation is in Proper Order . . . . . ☐
Samples Received Properly Chilled . . . . . ☐
Lab. Ref/Batch No.

* Container Type & Preservation Codes: P - Plastic, G - Solvent Washed Acid Rinsed Glass Bottle, V - Vial, N - Nitric Acid Preserved
C - Hydrochloric Acid Preserved, S - Sulphuric Acid Preserved, I - Ice

mgt LabMark
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ABN – 50 005 085 521 e mail : enviro@mgtlabmark com au web : www.mgtlabmark com au

Melbourne
3-5 Kingston Town Close
Oakleigh Vic 3166
Phone : +61 3 9564 7055
NATA # 1261
Site # 1254

Sydney
Unit F6, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 8215 8222
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Sample Receipt Advice

Company name: Coffey Environments Pty Ltd ACT

Contact name: Jon Thompson
Client job number: MANUKA OVAL REDEVELOPMENT GEOFYSH09552AA
COC number: 94280
Turn around time: 5 Day
Date/Time received: Jun 6, 2012 9:00 AM
MGT lab reference: 339911

Sample information

- ☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ☑ All samples have been received as described on the above COC.
- ☑ COC has been completed correctly.
- ☑ Attempt to chill was evident.
- ☑ Appropriately preserved sample containers have been used.
- ☑ All samples were received in good condition.
- ☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ☑ Organic samples had Teflon liners.
- ☒ Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Onur Mehmet on Phone : (+61) (3) 9564 7055 or by e.mail: onur.mehmet@mgtlabmark.com.au

Results will be delivered electronically via e.mail to Jon Thompson - jon_thompson@coffey.com.

mgt Labmark Sample Receipt

mgt LabMark
ENVIRONMENTAL LABORATORIES
ABN – 50 005 085 521 e.mail: enviro@mgtlabmark.com.au web : www.mgtlabmark.com.au

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Phone : +61 3 9564 7055
NATA # 1261
Site # 1254

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Unit F6, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 8215 8222
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Company Name: Coffey Environments Pty Ltd ACT
Address: 17 Torrens St
Braddon
ACT 2612

Order No.: 339911
Report #: 02 6248 7154
Phone: 02 6248 7157
Fax:

Received: Jun 6, 2012 9:00 AM
Due: Jun 14, 2012 4:00 PM
Priority: 5 Day
Contact name: Jon Thompson

Client Job No.: GEOFYSH09552AA- MANUKA OVAL REDEVELOPMENT

mgt-LabMark Client Manager: Onur Mehmet

Sample Detail					% Moisture	Chloride	pH (1:5 Aqueous extract)	Resistivity*	Salinity (expressed as TDS)	Sulphate (S)
Laboratory where analysis is conducted										
Melbourne Laboratory - NATA Site # 1254 & 14271										
Sydney Laboratory - NATA Site # 18217					X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794										
External Laboratory										
Sample ID	Sample Date	Sampling Time	Matrix	LAB ID						
BH1 3.0-3.2	Jun 30, 2012		Soil	S12-Jn04117	X	X	X	X	X	X
BH1 3.7-4.0	Jun 30, 2012		Soil	S12-Jn04118	X	X	X	X	X	X
BH2 2.0-2.2	Jun 30, 2012		Soil	S12-Jn04119	X	X	X	X	X	X
BH3 1.7-1.8	Jun 30, 2012		Soil	S12-Jn04120	X	X	X	X	X	X
BH4 0.5-0.7	Jun 01, 2012		Soil	S12-Jn04121	X	X	X	X	X	X
BH4 2.5-3.4	Jun 01, 2012		Soil	S12-Jn04122	X	X	X	X	X	X
BH5 0.8-1.0	Jun 02, 2012		Soil	S12-Jn04123	X	X	X	X	X	X
BH6 1.7-2.0	Jun 01, 2012		Soil	S12-Jn04124	X	X	X	X	X	X
BH6 5.2-5.5	Jun 01, 2012		Soil	S12-Jn04125	X	X	X	X	X	X
BH4 1.8-2.0	Jun 01, 2012		Soil	S12-Jn04126	X	X	X	X	X	X

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Certificate of Analysis

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards

Coffey Environments Pty Ltd ACT
17 Torrens St
Braddon
ACT 2612

Attention:Jon Thompson

Report	339911-S
Client Reference	MANUKA OVAL REDEVELOPMENT GEOFYSH09552AA
Received Date	Jun 06, 2012

Client Sample ID			BH1 3.0-3.2	BH1 3.7-4.0	BH2 2.0-2.2	BH3 1.7-1.8
Sample Matrix			Soil	Soil	Soil	Soil
mgt-LabMark Sample No.			S12-Jn04117	S12-Jn04118	S12-Jn04119	S12-Jn04120
Date Sampled			Jun 30, 2012	Jun 30, 2012	Jun 30, 2012	Jun 30, 2012
Test/Reference	LOR	Unit				
Chloride	10	mg/kg	44	500	120	16
pH (1:5 Aqueous extract)	0.1	units	8.7	8.5	7.9	7.1
Resistivity*	0.5	ohm.m	59	18	44	150
Salinity (expressed as TDS)	50	mg/kg	120	420	160	< 50
Sulphate (S)	10	mg/kg	< 10	120	< 10	18
% Moisture	0.1	%	11	16	11	9.4

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Client Sample ID			BH4 0.5-0.7	BH4 2.5-3.4	BH5 0.8-1.0	BH6 1.7-2.0
Sample Matrix			Soil	Soil	Soil	Soil
mgt-LabMark Sample No.			S12-Jn04121	S12-Jn04122	S12-Jn04123	S12-Jn04124
Date Sampled			Jun 01, 2012	Jun 01, 2012	Jun 02, 2012	Jun 01, 2012
Test/Reference	LOR	Unit				
Chloride	10	mg/kg	< 10	< 10	200	120
pH (1:5 Aqueous extract)	0.1	units	8.7	8.4	9.3	8.0
Resistivity*	0.5	ohm.m	70	260	28	48
Salinity (expressed as TDS)	50	mg/kg	97	< 50	260	160
Sulphate (S)	10	mg/kg	27	< 10	83	35
% Moisture	0.1	%	6.4	11	11	17

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ENVIRONMENTAL LABORATORIES

Client Sample ID			BH6 5.2-5.5	BH4 1.8-2.0
Sample Matrix			Soil	Soil
mgt-LabMark Sample No.			S12-Jn04125	S12-Jn04126
Date Sampled			Jun 01, 2012	Jun 01, 2012
Test/Reference	LOR	Unit		
Chloride	10	mg/kg	180	< 10
pH (1:5 Aqueous extract)	0.1	units	8.2	8.8
Resistivity*	0.5	ohm.m	45	77
Salinity (expressed as TDS)	50	mg/kg	160	91
Sulphate (S)	10	mg/kg	31	15
% Moisture	0.1	%	11	8.6

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Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported

Description	Testing Site	Extracted	Holding Time
Chloride - Method. E033 /E045 /E047 Chloride	Sydney	Jun 12, 2012	28 Day
pH (1:5 Aqueous extract) - Method. E018 pH	Sydney	Jun 12, 2012	7 Day
Resistivity* - Method. Resistivity is calculated as the inverse of Conductivity (1:5 aqueous extract)	Sydney	Jun 12, 2012	
Salinity (expressed as TDS) - Method. APHA 2510 Conductivity by Direct Measurement	Sydney	Jun 12, 2012	21 Day
Sulphate (S) - Method: E045 Sulphate	Sydney	Jun 12, 2012	28 Day
% Moisture - Method. E005 Moisture Content	Sydney	Jun 12, 2012	28 Day

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NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone +61 7 3902 4500
NATA # 1261 Site # 20794

Company Name:	Coffey Environments Pty Ltd ACT	Order No.:	339911
Address:	17 Torrens St Braddon ACT 2612	Report #:	
		Phone:	02 6248 7154
		Fax:	02 6248 7157
Client Job No.:	GEOFYSH09552AA- MANUKA OVAL REDEVELOPMENT	Received:	Jun 6, 2012 9:00 AM
		Due:	Jun 14, 2012 4:00 PM
		Priority:	5 Day
		Contact name:	Jon Thompson

mgt-LabMark Client Manager: Onur Mehmet

Sample Detail	Suiphate (S)	Salinity (expressed as TDS)	Resistivity*	pH (1:5 Aqueous extract)	Chloride	% Moisture
Laboratory where analysis is conducted						
Melbourne Laboratory - NATA Site # 1254 & 14271						
Sydney Laboratory - NATA Site # 18217	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794						
External Laboratory						

Sample ID	Sample Date	Sampling Time	Matrix	LAB ID						
BH1 3.0-3.2	Jun 30, 2012		Soil	S12-Jn04117	X	X	X	X	X	X
BH1 3.7-4.0	Jun 30, 2012		Soil	S12-Jn04118	X	X	X	X	X	X
BH2 2.0-2.2	Jun 30, 2012		Soil	S12-Jn04119	X	X	X	X	X	X
BH3 1.7-1.8	Jun 30, 2012		Soil	S12-Jn04120	X	X	X	X	X	X
BH4 0.5-0.7	Jun 01, 2012		Soil	S12-Jn04121	X	X	X	X	X	X
BH4 2.5-3.4	Jun 01, 2012		Soil	S12-Jn04122	X	X	X	X	X	X
BH5 0.8-1.0	Jun 02, 2012		Soil	S12-Jn04123	X	X	X	X	X	X
BH6 1.7-2.0	Jun 01, 2012		Soil	S12-Jn04124	X	X	X	X	X	X
BH6 5.2-5.5	Jun 01, 2012		Soil	S12-Jn04125	X	X	X	X	X	X
BH4 1.8-2.0	Jun 01, 2012		Soil	S12-Jn04126	X	X	X	X	X	X

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Actual PQLs are matrix dependant. Quoted PQLs may be raised where sample extracts are diluted due to interferences
4. Results are uncorrected for matrix spikes or surrogate recoveries
5. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise
6. Samples were analysed on an 'as received' basis.
7. This report replaces any interim results previously issued

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001)

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Acknowledgment

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control

~NOTE: pH duplicates are reported as a range NOT as an RPD

UNITS

mg/kg:milligrams per Kilogram	mg/L:milligrams per litre
µg/L:micrograms per litre	ppm:Parts per million
ppb:Parts per billion	%:Percentage
org/100mL:Organisms per 100 millilitres	NTU:Nephelometric Turbidity Units
MPN/100mL:Most Probable Number of organisms per 100 millilitres	

TERMS

Dry:	Where a moisture has been determined on a solid sample the result is expressed on a dry basis
LOR:	Limit Of Reporting
SPIKE:	Addition of the analyte to the sample and reported as percentage recovery
RPD:	Relative Percent Difference between two Duplicate pieces of analysis.
LCS:	Laboratory Control Sample - reported as percent recovery
CRM:	Certified Reference Material - reported as percent recovery
Method Blank:	In the case of solid samples these are performed on laboratory certified clean sands. In the case of water samples these are performed on de-ionised water
Surr - Surrogate:	The addition of a like compound to the analyte target and reported as percentage recovery
Duplicate:	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
Batch Duplicate:	A second piece of analysis from a sample outside of the client's batch of samples but run within the laboratory batch of analysis.
Batch SPIKE:	Spike recovery reported on a sample from outside of the client's batch of samples but run within the laboratory batch of analysis.
USEPA:	U S Environmental Protection Agency
APHA:	American Public Health Association
ASLP:	Australian Standard Leaching Procedure (AS4439.3)
TCLP:	Toxicity Characteristic Leaching Procedure
COC:	Chain Of Custody
SRA:	Sample Receipt Advice
CP:	Client Parent - QC was performed on samples pertaining to this report
NCP:	Non-Client Parent - QC was performed on samples not pertaining to this report, however QC is representative of the sequence or batch that client samples were analysed within

QC - ACCEPTANCE CRITERIA

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries : Recoveries must lie between 50-150% - Phenols 20-130%

QC DATA GENERAL COMMENTS

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1 10 ratio. The Parent and Duplicate data shown is not data from your samples
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxophene & Chlordane are not added to the LCS
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxophene is not added to the Spike
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS's
9. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample>
10. Duplicate RPD's are calculated from raw analytical data thus it is possible to have two sets of data below the LOR with a positive RPD - eg. LOR 0.1, Result A = <0.1 (raw data is 0.02) & Result B = <0.1 (raw data is 0.03) resulting in a RPD of 40% calculated from the raw data

First Reported: Jun 13, 2012
Date Reported: Jun 13, 2012

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Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Chloride	mg/kg	< 10			10	Pass	
LCS - % Recovery							
Chloride	%	105			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
				Result 1	Result 2	RPD			
Chloride	S12-Jn04117	CP	mg/kg	44	38	14	30%	Pass	
Resistivity*	S12-Jn04117	CP	ohm.m	59	67	12	30%	Pass	
Salinity (expressed as TDS)	S12-Jn04117	CP	mg/kg	120	110	12	30%	Pass	
Sulphate (S)	S12-Jn04117	CP	mg/kg	< 10	< 10	22	30%	Pass	

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Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Organic samples had Teflon liners	Yes
Sample containers for volatile analysis received with minimal headspace	N/A
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Authorised By

Onur Mehmet	Client Services
Bob Symons	Senior Analyst-Inorganic (NSW)

Dr. Bob Symons
Laboratory Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Uncertainty data is available on request

mgt-LabMark shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall mgt-LabMark be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

First Reported: Jun 13, 2012
Date Reported: Jun 13, 2012
mgt-LabMark Unit F6, Building F, 16 Mars Road, Lane Cove West, NSW, Australia, 2066
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Fyshwick,Canberra Laboratory

Coffey Information Pty Ltd
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Fyshwick ACT 2609

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Fax: +61 2 6260 7211

coffey information
SPECIALISTS IN SCIENTIFIC TESTING SOLUTIONS

Material Test Report

Report No: FYSH12S-01367-1
Issue No: 1

Client:	Coffey Geotechnics Fyshwick P.O. Box 152 Fyshwick ACT 2609
Principal:	
Project No.:	INFOFYSH00475AC
Project Name:	GEOTFYSH09552AA - MANUKA OVAL
Lot No.:	TRN:

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NATA
ACCREDITATION

Approved Signatory: Jason McGurgan
(Laboratory Manager)
NATA Accredited Laboratory Number 431
Date of Issue 15/06/2012

Sample Details

Sample ID:	FYSH12S-01367
Client Sample:	
Date Sampled:	02/06/2012
Source:	Insitu
Material:	Natural Material
Specification:	AS Grading
Sampling Method:	Submitted by client
Project Location:	MANUKA, ACT
Sample Location:	BH1: 2.5m to 2.95m

Other Test Results

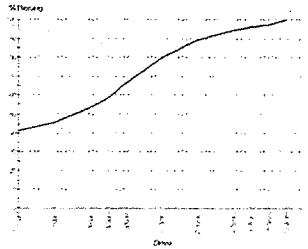
Description	Method	Result	Limits
Sample History	AS 1289.1.1	Oven-dried	
Preparation	AS 1289.1.1	Dry Sieved	
Linear Shrinkage (%)	AS 1289.3.4.1	12.0	
Mould Length (mm)		254	
Crumbling		No	
Curling		No	
Liquid Limit (%)	AS 1289.3.1.2	41	
Method		One Point	
Plastic Limit (%)	AS 1289.3.2.1	17	
Plasticity Index (%)	AS 1289.3.3.1	24	

Particle Size Distribution

Method:	AS 1289.3.6.1
Drying by:	Oven
Date Tested:	8/06/2012
Note:	Sample Washed

Sieve Size	% Passing	Limits
13.2mm	100	
9.5mm	97	
6.7mm	96	
4.75mm	95	
2.36mm	89	
1.18mm	80	
600µm	67	
425µm	59	
300µm	53	
150µm	45	
75µm	41	

Chart



Comments
N/A

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Fyshwick,Canberra Laboratory

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Fax: +61 2 6260 7211

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SPECIALISTS IN SCIENTIFIC TESTING SOLUTIONS

Material Test Report

Report No: FYSH12S-01368-1
Issue No: 1

Client:	Coffey Geotechnics Fyshwick P.O. Box 152 Fyshwick ACT 2609
Principal:	
Project No.:	INFOFYSH00475AC
Project Name:	GEOTFYSH09552AA - MANUKA OVAL
Lot No.:	TRN:

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NATA
ACCREDITATION

Approved Signatory: Jason McGurgan
(Laboratory Manager)
NATA Accredited Laboratory Number 431
Date of Issue 15/06/2012

Sample Details

Sample ID:	FYSH12S-01368
Client Sample:	
Date Sampled:	02/06/2012
Source:	Insitu
Material:	Natural Material
Specification:	AS Grading
Sampling Method:	Submitted by client
Project Location:	MANUKA, ACT
Sample Location:	BH2: 1.0m to 1.45m

Other Test Results

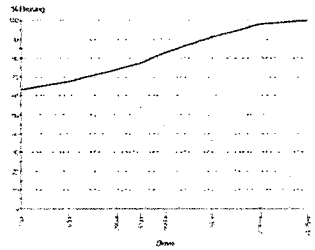
Description	Method	Result	Limits

Particle Size Distribution

Method:	AS 1289.3.6.1
Drying by:	Oven
Date Tested:	8/06/2012
Note:	Sample Washed

Sieve Size	% Passing	Limits
4.75mm	100	
2.36mm	98	
1.18mm	91	
600µm	83	
425µm	78	
300µm	74	
150µm	68	
75µm	63	

Chart



Comments
N/A

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Fyshwick,Canberra Laboratory

Coffey Information Pty Ltd
ABN 92 114 364 046
16 Mildura Street
Fyshwick ACT 2609

Phone: +61 2 6260 7288
Fax: +61 2 6260 7211

coffey information
SPECIALISTS IN SCIENTIFIC TESTING SOLUTIONS

Report No: FYSH12S-01369-1
Issue No: 1

Material Test Report

Client: Coffey Geotechnics Fyshwick
P.O. Box 152
Fyshwick ACT 2609

Principal:
Project No.: INFOFYSH00475AC
Project Name: GEOTFYSH09552AA - MANUKA OVAL
Lot No.: TRN:

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Approved Signatory: Jason McGurgan
(Laboratory Manager)
NATA Accredited Laboratory Number 431
Date of Issue 15/06/2012

Sample Details

Sample ID: FYSH12S-01369
Client Sample:
Date Sampled: 02/06/2012
Source: Insitu
Material: Natural Material
Specification: AS Grading
Sampling Method: Submitted by client
Project Location: MANUKA, ACT
Sample Location: BH4: 4.0m to 4.45m

Other Test Results

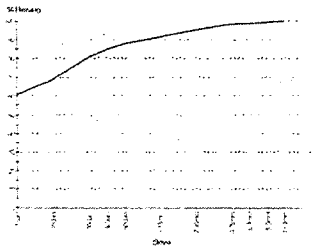
Description	Method	Result	Limits
Sample History	AS 1289.1.1	Oven-dried	
Preparation	AS 1289.1.1	Dry Sieved	
Linear Shrinkage (%)	AS 1289.3.4.1	12.5	
Mould Length (mm)		127	
Crumbling		No	
Curling		No	
Liquid Limit (%)	AS 1289.3.1.2	38	
Method		One Point	
Plastic Limit (%)	AS 1289.3.2.1	16	
Plasticity Index (%)	AS 1289.3.3.1	22	

Particle Size Distribution

Method: AS 1289.3.6.1
Drying by: Oven
Date Tested: 8/06/2012
Note: Sample Washed

Sieve Size	% Passing	Limits
13.2mm	100	
9.5mm	99	
6.7mm	99	
4.75mm	98	
2.36mm	95	
1.18mm	91	
600µm	88	
425µm	85	
300µm	81	
150µm	69	
75µm	61	

Chart



Comments

N/A

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coffey information
SPECIALISTS IN SCIENTIFIC TESTING SOLUTIONS

Report No: FYSH12S-01467-1
Issue No: 1

Material Test Report

Client: Coffey Geotechnics Fyshwick
P.O. Box 152
Fyshwick ACT 2609

Principal:
Project No.: INFOFYSH00475AC
Project Name: GEOTFYSH09552AA - MANUKA OVAL
Lot No.: TRN:

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Approved Signatory: Jason McGurgan
(Laboratory Manager)
NATA Accredited Laboratory Number 431
Date of Issue 15/06/2012

Sample Details

Sample ID: FYSH12S-01467
Client Sample:
Date Sampled: 02/06/2012
Source: Insitu
Material: Natural Material
Specification: AS Grading
Sampling Method: Submitted by client
Project Location: MANUKA, ACT
Sample Location: BH5: 1.0m to 1.45m

Test Results

Description	Method	Result	Limits
Sample History	AS 1289.1.1	Oven-dried	
Preparation	AS 1289.1.1	Dry Sieved	
Linear Shrinkage (%)	AS 1289.3.4.1	7.0	
Mould Length (mm)		127	
Crumbling		No	
Curling		No	
Liquid Limit (%)	AS 1289.3.1.2	31	
Method		One Point	
Plastic Limit (%)	AS 1289.3.2.1	17	
Plasticity Index (%)	AS 1289.3.3.1	14	

Comments

N/A

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coffey information
SPECIALISTS IN SCIENTIFIC TESTING SOLUTIONS

Material Test Report

Report No: FYSH12S-01370-1
Issue No: 1

Client: Coffey Geotechnics Fyshwick
P.O. Box 152
Fyshwick ACT 2609

Principal:
Project No.: INFOFYSH00475AC
Project Name: GEOTFYSH09552AA - MANUKA OVAL
Lot No.: TRN:

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Approved Signatory: Jason McGurgan
(Laboratory Manager)
NATA Accredited Laboratory Number 431
Date of Issue: 15/06/2012

Sample Details

Sample ID:	FYSH12S-01370
Client Sample:	
Date Sampled:	02/06/2012
Source:	Insitu
Material:	Natural Material
Specification:	AS Grading
Sampling Method:	Submitted by client
Project Location:	MANUKA, ACT
Sample Location:	BH-H1: 0.5m to 0.95m

Other Test Results

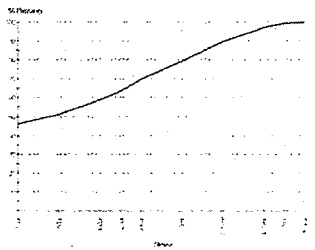
Description	Method	Result	Limits
Sample History	AS 1289.1.1	Oven-dried	
Preparation	AS 1289.1.1	Dry Sieved	
Linear Shrinkage (%)	AS 1289.3.4.1	N/A	
Mould Length (mm)		0	
Crumbling		No	
Curling		No	
Liquid Limit (%)	AS 1289.3.1.2	31	
Method		One Point	
Plastic Limit (%)	AS 1289.3.2.1	16	
Plasticity Index (%)	AS 1289.3.3.1	15	

Particle Size Distribution

Method:	AS 1289.3.6.1
Drying by:	Oven
Date Tested:	8/06/2012
Note:	Sample Washed

Sieve Size	% Passing	Limits
9.5mm	100	
6.7mm	99	
4.75mm	97	
2.36mm	89	
1.18mm	79	
600µm	70	
425µm	63	
300µm	59	
150µm	51	
75µm	46	

Chart



Comments

N/A

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coffey information
SPECIALISTS IN SCIENTIFIC TESTING SOLUTIONS

Material Test Report

Report No: FYSH12S-01371-1
Issue No: 1

Client: Coffey Geotechnics Fyshwick
P.O. Box 152
Fyshwick ACT 2609

Principal:
Project No.: INFOFYSH00475AC
Project Name: GEOTFYSH09552AA - MANUKA OVAL
Lot No.: TRN:

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Approved Signatory: Jason McGurgan
(Laboratory Manager)
NATA Accredited Laboratory Number 431
Date of Issue: 15/06/2012

Sample Details

Sample ID:	FYSH12S-01371
Client Sample:	
Date Sampled:	02/06/2012
Source:	Insitu
Material:	Natural Material
Specification:	AS Grading
Sampling Method:	Submitted by client
Project Location:	MANUKA, ACT
Sample Location:	BH-M1: 1.0m to 1.45m

Other Test Results

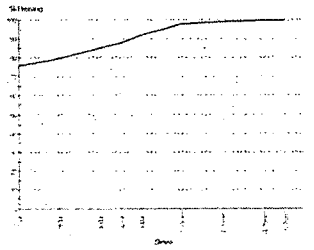
Description	Method	Result	Limits

Particle Size Distribution

Method:	AS 1289.3.6.1
Drying by:	Oven
Date Tested:	8/06/2012
Note:	Sample Washed

Sieve Size	% Passing	Limits
6.7mm	100	
4.75mm	100	
2.36mm	99	
1.18mm	98	
600µm	92	
425µm	88	
300µm	85	
150µm	80	
75µm	76	

Chart



Comments

N/A

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coffey information
SPECIALISTS IN SCIENTIFIC TESTING SOLUTIONS

Material Test Report

Report No: FYSH12S-01466-1
Issue No: 1

Client: Coffey Geotechnics Fyshwick
P.O. Box 152
Fyshwick ACT 2609

Principal:
Project No.: INFOFYSH00475AC
Project Name: GEOTFYSH09552AA - MANUKA OVAL
Lot No.: TRN:

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Approved Signatory Jason McGurgan
(Laboratory Manager)
NATA Accredited Laboratory Number 431
Date of Issue 15/06/2012

Sample Details

Sample ID: FYSH12S-01466
Client Sample:
Date Sampled: 02/06/2012
Source: Insitu
Material: Natural Material
Specification: AS Grading
Sampling Method: Submitted by client
Project Location: MANUKA, ACT
Sample Location: BH-P2: 1.0m to 1.4m

Test Results

Description	Method	Result	Limits
Sample History	AS 1289.1.1	Oven-dried	
Preparation	AS 1289.1.1	Dry Sieved	
Linear Shrinkage (%)	AS 1289.3.4.1	11.0	
Mould Length (mm)		127	
Crumbling		No	
Curling		No	
Liquid Limit (%)	AS 1289.3.1.2	33	
Method		One Point	
Plastic Limit (%)	AS 1289.3.2.1	15	
Plasticity Index (%)	AS 1289.3.3.1	18	

Comments

N/A

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Job No. GEOTFYSH09552AA
Sheet 1 of 2

POINT LOAD STRENGTH INDEX
Australian Standard AS4133.4.1-1993 Method 4.1:Rock Strength Tests - Determination of Point Load Strength Index

CLIENT: Cox Architects
PROJECT: Manuka Oval Redevelopment
LOCATION: Manuka, ACT

Test Machine: Lab
Testing Locality: Fyshwick
Tested By: SB
Test Date: 12-Jun-12
Checked: JT

Date of Calibration: -
Calibrated By: -
Sampled Date: 12-Jun-12
Storage Location: Lab

Borehole No. / Test Depth (m)		Rock Description	Moisture Condition[1] (N, D or S)	Length L [2] (mm)	Diameter D (mm)	Load P (Gauge) (N)	Diametral test $I_s=(P/D^2)$ x 1000 (MPa)	Size Correction $F=(D/50)^{0.45}$	$I_{s(50)}$ (MPa)	Strength Class (Diametral)	Axial or Irregular lump Width W (core diameter) (mm)	Platen Separation D [2] (mm)	D_e^2	Load (Gauge) (kN)	$I_s=(P/D_e^2)$ x 1000 (MPa)	Size Correction $F=(D_e/50)^{0.45}$	$I_{s(50)}$ (MPa)	Strength Class (Axial)	Comments / Strength Classification
BH1	4.8	SILT	N	110.0	50.0	0.2	0.08	1.00	0.08	V. Low									
BH2	6.0	SILT	N	100.0	50.0	0.5	0.20	1.00	0.20	Low									
BH2	8.2	SILT	N	110.0	50.0	3.14	1.26	1.00	1.26	High									
BH2	9.2	SILT	N	100.0	50.0	2.48	0.99	1.00	0.99	Medium									
BH3	7.1	SILT	N	110.0	50.0	0.14	0.06	1.00	0.1	V. Low									
BH3	9.5	SILT	N	100.0	50.0	0.47	0.19	1.00	0.2	Low									
BH3	10.5	SILT	N	100.0	50.0	0.24	0.10	1.00	0.1	V. Low									
BH3	11.4	SILT	N	110.0	50.0	0.29	0.12	1.00	0.1	Low									
BH5	4.2	SILT	N	110.0	50.0	1.44	0.58	1.00	0.6	Medium									
BH5	5.3	SILT	N	110.0	50.0	0.54	0.22	1.00	0.2	Low									
BH5	6.5	SILT	N	100.0	50.0	1.99	0.80	1.00	0.8	Medium									
BH5	7.5	SILT	N	110.0	50.0	2.45	0.98	1.00	1.0	Medium									
BH5	8.8	SILT	N	100.0	50.0	2.55	1.02	1.00	1.0	High									
BH6	6.0	SILT	N	100.0	50.0	2.32	0.93	1.00	0.9	Medium									
BH6	7.2	SILT	N	100.0	50.0	1.60	0.64	1.00	0.6	Medium									

NOTES
$I_{s(50)}$ MPa and Strength Classification
(1) N = Natural, D = Dry, S = Saturated
(2): L > 0.5D, 0.3 < D/W < 1.0

< 0.1	Very Low	1 - 3	High
0.1 - 0.3	Low	3 - 10	Very High
0.3 - 1	Medium	> 10	Extreamly High

Failure Description:
1. Fracture through fabric of specimen oblique to bedding, not influenced by weak planes.
2. Fracture along bedding.
3. Fracture influenced by pre-existing plane, microfracture, vein, chemical alteration.
4. Chip or partial fracture

TEST TYPES:
AXIAL (A)
DIAMETRAL (D)
IRREGULAR LUMP (I)

$$I_{s(50)} = 1000 \times \frac{P}{D_e^2} \times \left(\frac{D_e}{50}\right)^{0.45} \quad (MPa)$$

Pointload Calc Sheet WORKSHEET 1 of 2

19/06/2012

POINT LOAD STRENGTH INDEX

Australian Standard AS4133.4.1-1993 Method 4.1:Rock Strength Tests - Determination of Point Load Strength Index

Job No. GEOTFYSH09552AA
Sheet 2 of 2

CLIENT: Cox Architects
PROJECT: Manuka Oval Redevelopment
LOCATION: Manuka, ACT

Test Machine: Lab
Testing Locality: Fyshwick
Tested By: SB
Test Date: 12-Jun-12
Checked: JT

Date of Calibration: -
Calibrated By: -
Sampled Date: 12-Jun-12
Storage Location: Lab

Borehole No. / Test Depth (m)		Rock Description	Moisture Condition[1] (N, D or S)	Diametral test: Length L [2] (mm)	Diameter D (mm)	Load P (Gauge) (N)	$I_s=(P/D^2)$ x 1000 (MPa)	Size Correction $F=(D/50)^{\wedge 0.45}$	$I_{s(50)}$ (MPa)	Strength Class (Diametral)	Axial or Irregular lump: Width W (core diameter) (mm)	Platen Separation D [2] (mm)	D_e^2	Load (Gauge) (kN)	$I_s=(P/D_e^2)$ x 1000 (MPa)	Size Correction $F=(D_e/50)^{\wedge 0.45}$	$I_{s(50)}$ (MPa)	Strength Class (Axial)	Comments / Strength Classification
BH6	8.5	SILT	N	110.0	50.0	3.00	1.20	1.00	1.20	High									
BH6	9.5	SILT	N	100.0	50.0	2.87	1.15	1.00	1.15	High									

NOTES

(1) N = Natural, D = Dry, S = Saturated
(2) L > 0.5D, 0.3 < D/W < 1.0

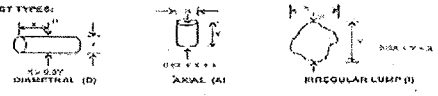
Failure Description:

1. Fracture through fabric of specimen oblique to bedding, not influenced by weak planes
2. Fracture along bedding.
3. Fracture influenced by pre-existing plane, microfracture, vein, chemical alteration.
4. Chip or partial fracture

$I_{s(50)}$ MPa and Strength Classification

< 0.1	Very Low	1 - 3	High
0.1 - 0.3	Low	3 - 10	Very High
0.3 - 1	Medium	> 10	Extreamly High

TEST TYPES:



$$I_{s(50)} = 1000 \times \frac{P}{D^2} \times \left(\frac{D}{50}\right)^{0.45} (MPa)$$

19/06/2012

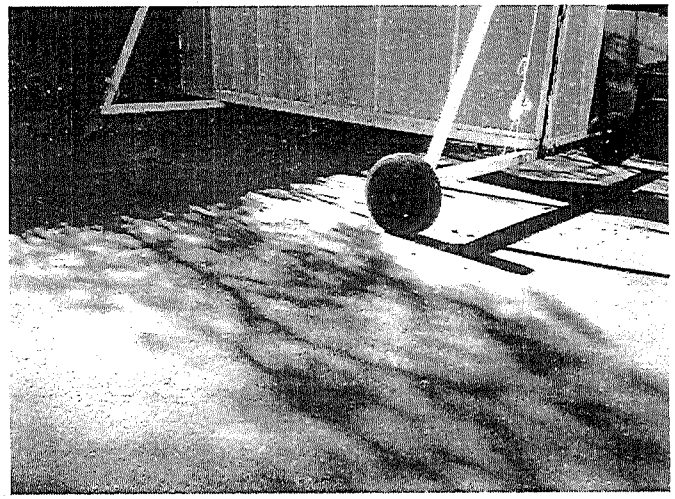
Pointload Calc Sheet WORKSHEET 2 of 2

Site Photo 1 – BH 1 Location photo

Site Photo 2 – BH 2 Location photo (BH located under car)

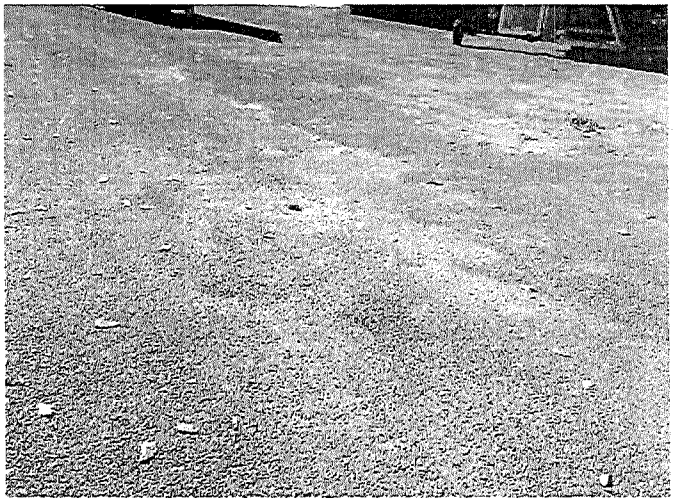
drawn	SB	coffey geotechnics SPECIALISTS MANAGING THE EARTH	client:	Cox Architects
approved	JT		project:	Manuka Oval Redevelopment
date	18/6/2011		title:	SITE PHOTOS
scale	NTS		project no: GEOTFYSH09552AA	Page: 1
original size	A4			

Site Photo 3 – BH 3 Location photo



Site Photo 4 – BH 4 Location photo

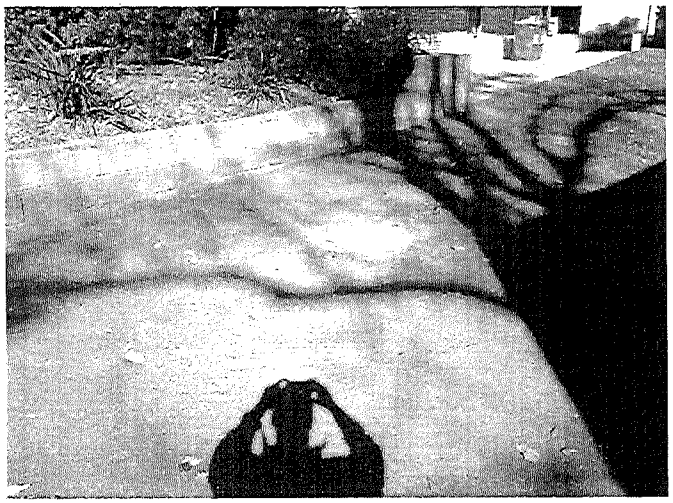
drawn	SB	coffey geotechnics SPECIALISTS MANAGING THE EARTH	client:	Cox Architects
approved	JT		project:	Manuka Oval Redevelopment
date	18/6/2011		title:	SITE PHOTOS
scale	NTS		project no: GEOTFYSH09552AA	Page: 2
original size	A4			



Site Photo 5 – BH 5 Location photo

Site Photo 6 – BH 6 Location photo

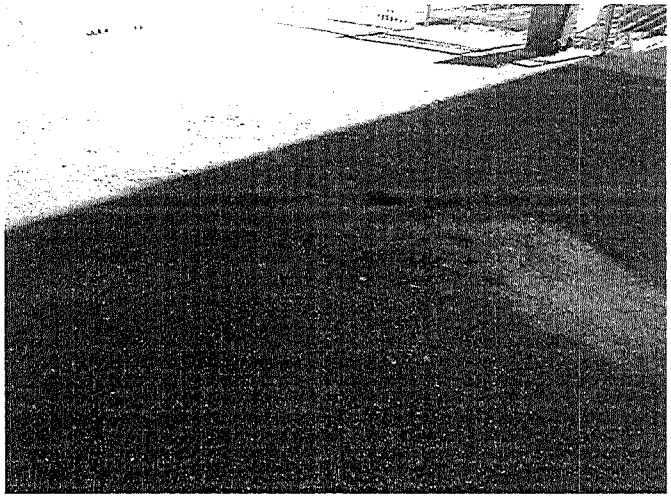
drawn	SB	coffey geotechnics SPECIALISTS MANAGING THE EARTH	client:	Cox Architects
approved	JT		project:	Manuka Oval Redevelopment
date	18/6/2011			
scale	NTS		title:	SITE PHOTOS
original size	A4		project no: GEOTFYSH09552AA	Page: 3



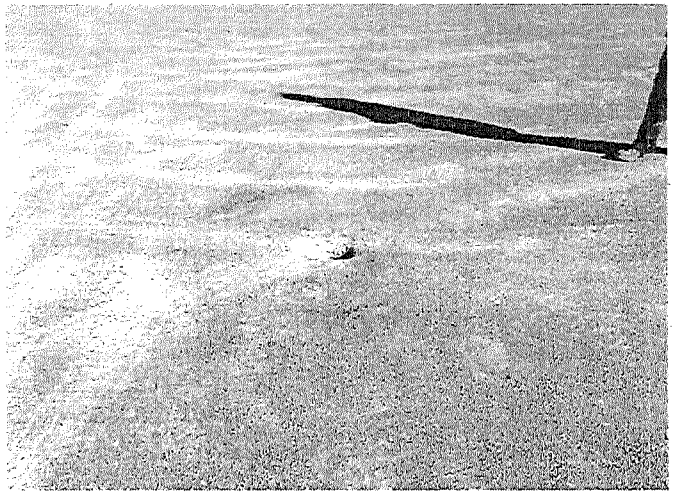
Site Photo 7 – BH H1 Location photo

Site Photo 8 – BH M1 Location photo (BH is under car)

drawn	SB	coffey geotechnics SPECIALISTS MANAGING THE EARTH	client:	Cox Architects
approved	JT		project:	Manuka Oval Redevelopment
date	18/6/2011			
scale	NTS		title:	SITE PHOTOS
original size	A4		project no: GEOTFYSH09552AA	Page: 4



Site Photo 9 – BH P1 Location photo



Site Photo 10 – BH P2 Location photo

drawn	SB	coffey geotechnics SPECIALISTS MANAGING THE EARTH	client:	Cox Architects
approved	JT		project:	Manuka Oval Redevelopment
date	18/6/2011		title:	SITE PHOTOS
scale	NTS		project no: GEOTFYSH09552AA	Page: 5
original size	A4			

Rea, Peter

From: Ian Smith [Ian.Smith@cox.com.au]
Sent: Tuesday, 2 October 2012 7:31 AM
To: John Anthony
Cc: Greg Sutton; Maginness, Ron; McNulty, Hamish; Rea, Peter; Rajesh Valera
Subject: RE: MANUKA
Attachments: photo.jpg

Hi John,

Is looking good! Ron and Hamish certainly conveyed the scale of the components. We look forward to seeing it in the flesh on site.

Cheers,

IS.

Ian Smith - Director

COX

Cox Architecture
22 Jardine Street, Kingston ACT 2604 Australia
E: Ian.Smith@cox.com.au | T: +61 2 6239 6255 | M: +61 437 037 981 | W: coxarchitecture.com.au | Disclaimer

---

From: John Anthony [mailto:JAnthony@AbacusLighting.com]
Sent: Monday, 1 October 2012 5:47 PM
To: Ian Smith
Cc: Greg Sutton; Ron.Maginness@act.gov.au; McNulty, Hamish
Subject: MANUKA

Hi Ian,

Not sure if you have been sent this already, but this is the first completed head frame as of Monday which has is now being galvanised. The photo does not really portray how large the head frame is. John

For and on behalf of Abacus Lighting

John Anthony | Abacus Lighting
Export Sales Director

Mob +44 (0)7770 730 442
email janthony@abacuslighting.com

twitter.com/AbacusLighting

****
Abacus Lighting Limited
Oddicroft Lane, Sutton in Ashfield, Nottinghamshire, UK, NG17 5FT
Company Registration Number: 612235
Telephone: +44 (0)1623 511 111 Fax: +44 (0)1623 552 133
www.abacuslighting.com

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intended solely for the use of the individual or entity to whom they

Rea, Peter

From: Ian Smith [Ian.Smith@cox.com.au]
Sent: Tuesday, 2 October 2012 7:31 AM
To: John Anthony
Cc: Greg Sutton; Maginness, Ron; McNulty, Hamish; Rea, Peter; Rajesh Valera
Subject: RE: MANUKA
Attachments: photo.jpg

Hi John,

Is looking good! Ron and Hamish certainly conveyed the scale of the components. We look forward to seeing it in the flesh on site.

Cheers,

IS.

Ian Smith - Director

COX

Cox Architecture
22 Jardine Street, Kingston ACT 2604 Australia
E: Ian.Smith@cox.com.au | T: +61 2 6239 6255 | M: +61 437 037 981 | W: coxarchitecture.com.au | Disclaimer

From: John Anthony [mailto:JAnthony@AbacusLighting.com]
Sent: Monday, 1 October 2012 5:47 PM
To: Ian Smith
Cc: Greg Sutton; Ron.Maginness@act.gov.au; McNulty, Hamish
Subject: MANUKA

Hi Ian,

Not sure if you have been sent this already, but this is the first completed head frame as of Monday which has is now being galvanised. The photo does not really portray how large the head frame is. John

For and on behalf of Abacus Lighting

John Anthony | Abacus Lighting
Export Sales Director

Mob +44 (0)7770 730 442
email janthony@abacuslighting.com

twitter.com/AbacusLighting

****
Abacus Lighting Limited
Oddicroft Lane, Sutton in Ashfield, Nottinghamshire, UK, NG17 5FT
Company Registration Number: 612235
Telephone: +44 (0)1623 511 111 Fax: +44 (0)1623 552 133
www.abacuslighting.com

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intended solely for the use of the individual or entity to whom they

Rea, Peter

From: Ian Smith [Ian.Smith@cox.com.au]
Sent: Monday, 1 October 2012 10:57 AM
To: Greg Sutton
Cc: Don Gilson; Rajesh Valera; Mitch Halley (Mitch@affinityelectrical.com.au); Brendan Read (brendan@affinityelectrical.com.au); Rea, Peter
Subject: FW: project schedule
Attachments: Manuka Oval Project Task details - Rev 4.xlsx

Hi Greg,

See attached schedule provided to Don by Rajesh. Please advise if this document is endorsed by you as the Contractor's representative. If yes, might be worth updating the gantt chart accordingly.

Thanks,

IS.

Ian Smith - Director

COX

Cox Architecture
22 Jardine Street, Kingston ACT 2604 Australia
E: Ian.Smith@cox.com.au | T: +61 2 6239 6255 | M: +61 437 037 981 | W: coxarchitecture.com.au | Disclaimer

---

From: Don Gilson
Sent: Friday, 28 September 2012 5:46 PM
To: Ian Smith
Subject: FW: project schedule

Ian
FYI
Rajesh sent this. I am intending to use it to track their progress.
Regards

Don Gilson - Senior Architect

COX

Cox Architecture
22 Jardine Street, Kingston ACT 2604 Australia
E: Don.Gilson@cox.com.au | T: +61 2 6239 6255 | W: coxarchitecture.com.au | Disclaimer

---

From: Rajesh Valera [mailto:rvalera@AbacusLighting.com]
Sent: Friday, 28 September 2012 3:19 PM
To: Don Gilson
Subject: project schedule

Hi Don,

Attach please find revised project schedule for your reference.

Kind Regards,

For and on behalf of Abacus Lighting Ltd

Rajesh Valera | Abacus Lighting

Site Manager – Manukau Oval - Australia

Mobile: 04 68 422 747 :: Email: rvalera@abacuslighting.com
12B Hansen Cct, Isaacs, ACT 2607, Australia

****
Abacus Lighting Limited
Oddicroft Lane, Sutton in Ashfield, Nottinghamshire, UK, NG17 5FT
Company Registration Number: 612235
Telephone: +44 (0)1623 511 111 Fax: +44 (0)1623 552 133
www.abacuslighting.com

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****

ORGANIZATION NAME : manukaoval
TASK REPORT FOR : All
REPORT FOR : Pending Tasks
REPORT TAKEN ON : 27 September 2012 09:21:18 PM

Parent Task Name	Task	te	Priority	Status	Notes
Electrical conduits	Electrical co	30	High	Upcoming	
Directional boring & conduits installation	Directional	20	High	Upcoming	
Directional boring & conduits installation	Lead in Con	10	High	Overdue	
Directional boring & conduits installation	Stage 1	50	High	Upcoming	
Directional boring & conduits installation	Stage 2	0	High	Upcoming	
Directional boring & conduits installation	Install cable	0	High	Upcoming	
Directional boring & conduits installation	Cables insta	0	High	Upcoming	
Communications conduits	Communica	20	High	Upcoming	
Communications conduits	Directional	20	High	Upcoming	
Directional boring & conduits installation	Stage 1	0	High	Upcoming	
Directional boring & conduits installation	Stage 2	0	High	Upcoming	
Directional boring & conduits installation	Install cable	0	High	Upcoming	
Directional boring & conduits installation	Cables insta	0	High	Upcoming	
Switchboards	Switchboar	50	High	Upcoming	
Switchboards	Manufactur	30	High	Upcoming	
Switchboards	Install switc	0	High	Upcoming	
Foundations	Foundation	0	High	Upcoming	
Towers 5 & 6	Towers 5 &	10	High	Upcoming	
Towers 5 & 6	Pile cap exc	0	High	Overdue	
Towers 5 & 6	Scabble pie	0	High	Upcoming	
Towers 5 & 6	Pile cap and	0	High	Upcoming	
Towers 5 & 6	Pile cap reo				
Towers 5 & 6	Place condu	0	High	Upcoming	
Towers 5 & 6	Place pile c	0	High	Upcoming	
Towers 5 & 6	Concrete cu	0	High	Upcoming	
Towers 5 & 6	Strip formw	0	High	Upcoming	
Towers 5 & 6	Earthworks	0	High	Upcoming	
Towers 1 & 4	Towers 1 &	0	High	Upcoming	
Towers 1 & 4	Place reo &	50	High	Overdue	
Towers 1 & 4	Pile cap exc	0	High	Upcoming	
Towers 1 & 4	Scabble pie	0	High	Upcoming	
Towers 1 & 4	Pile cap and	0	High	Upcoming	
Towers 1 & 4	Pile cap reo	0	High	Upcoming	
Towers 1 & 4	Place condu	0	High	Upcoming	
Towers 1 & 4	Place pile c	0	High	Upcoming	
Towers 1 & 4	Place pile c	0	High	Upcoming	
Towers 1 & 4	Concrete cu	0	High	Upcoming	
Towers 1 & 4	Strip formw	0	High	Upcoming	
Towers 1 & 4	Earthworks	0	High	Upcoming	
Towers 2 & 3	Towers 2 &	0	High	Upcoming	
Towers 2 & 3	Bore holes	0	High	Overdue	
Towers 2 & 3	Place reo &	0	High	Upcoming	
Towers 2 & 3	Pile cap exc	0	High	Upcoming	
Towers 2 & 3	Scabble pie	0	High	Upcoming	

Towers 2 & 3	Pile cap and	0	High	Upcoming	
Towers 2 & 3	Pile cap reo	0	High	Upcoming	
Towers 2 & 3	Place condu	0	High	Upcoming	
Towers 2 & 3	Place pile ca	0	High	Upcoming	
Towers 2 & 3	Place pile ca	0	High	Upcoming	
Towers 2 & 3	Concrete cu	0	High	Upcoming	
Towers 2 & 3	Strip formw	0	High	Upcoming	
Towers 2 & 3	Earthworks	0	High	Upcoming	
Headframes	Headframes	0	High	Upcoming	
Headframes 5 & 6	Headframes	0	High	Upcoming	
Headframes 5 & 6	Deliver to si	0	High	Upcoming	
Headframes 5 & 6	Assemble	0	High	Upcoming	
Headframes 1 & 4	Headframes	0	High	Upcoming	
Headframes 1 & 4	Deliver to si	0	High	Upcoming	
Headframes 1 & 4	Assemble	0	High	Upcoming	
Headframes 2 & 3	Headframe:	0	High	Upcoming	
Headframes 2 & 3	Deliver to s	0	High	Upcoming	
Headframes 2 & 3	Assemble	0	High	Upcoming	
Masts	Masts	0	High	Upcoming	
Masts 5 & 6	Masts 5 & 6	0	High	Upcoming	
Masts 5 & 6	Deliver to s	0	High	Upcoming	
Masts 5 & 6	Assemble	0	High	Upcoming	
Masts 5 & 6	Lift mast	0	High	Upcoming	
Masts 5 & 6	Switchboar	0	High	Upcoming	
Masts 1 & 4	Masts 1 & 4	0	High	Upcoming	
Masts 1 & 4	Deliver to s	0	High	Upcoming	
Masts 1 & 4	Assemble	0	High	Upcoming	
Masts 1 & 4	Lift mast	0	High	Upcoming	
Masts 1 & 4	Switchboar	0	High	Upcoming	
Masts 2 & 3	Masts 2 &	0	High	Upcoming	
Masts 2 & 3	Deliver to s	0	High	Upcoming	
Masts 2 & 3	Assemble	0	High	Upcoming	
Masts 2 & 3	Lift mast	0	High	Upcoming	
Masts 2 & 3	Switchboar	0	High	Upcoming	
Substation enclosure	Substation	0	High	Upcoming	
Substation enclosure	Transform	0	High	Upcoming	
Transformers & plinths	Excavate &	0	High	Overdue	
Transformers & plinths	Place earth	50	High	Overdue	
Transformers & plinths	Place cond	0	High	Overdue	
Transformers & plinths	Plinth form	0	High	Overdue	
Transformers & plinths	ACTEW su	0	High	Upcoming	
Substation enclosure	Enclosure	0	High	Upcoming	
Enclosure Blockwalling	Footings &	0	High	Upcoming	
Enclosure Blockwalling	Place swit	0	High	Upcoming	
Enclosure Blockwalling	Blockwork	0	High	Upcoming	
Enclosure Blockwalling	Fencing	0	High	Upcoming	
Reinstatement works	Reinstater	0	High	Upcoming	
Reinstatement works	Repair asp	0	High	Upcoming	
Reinstatement works	Landscape	0	High	Upcoming	
Testing & commissioning	Testing &	0	High	Upcoming	

Testing & commissioning	ACTPLA	0	High	Upcoming	
Testing & commissioning	Energise	0	High	Upcoming	
Testing & commissioning	Aim ligh	0	High	Upcoming	
Completion	Comple	0	High	Upcoming	
Completion	Final ins	0	High	Upcoming	
Completion	Practica	0	High	Upcoming	

Rea, Peter

From: McNulty, Hamish
Sent: Thursday, 27 September 2012 8:14 AM
To: Guthrie, Neale
Cc: Maginness, Ron; Rea, Peter; Florence, Rod; O'Leary, Shane
Subject: RE: Progress photographs and project update

Neale

Will do - I note Chris Welbourn's comments about the completion date not being adversely affected and am following up about how such a major change has happened in the short time since the factory visit and reinforcing the importance of the 21 December date.

Cheers

Hamish

Hamish McNulty | Executive Director |
' Phone 02 6205 9674 | Fax 02 6207 0123 | Mobile 0418 619 057 |
Infrastructure and Capital Works | Economic Development Directorate | ACT Government Level 6, TransACT House, 470 Northbourne Avenue Dickson ACT 2602 | GPO Box 158 Canberra ACT 2601 | www.economicdevelopment.act.gov.au

P Please consider the environment before printing this e-mail.

-----Original Message-----
From: Guthrie, Neale
Sent: Thursday, 27 September 2012 8:11 AM
To: McNulty, Hamish
Cc: Maginness, Ron; Rea, Peter; Florence, Rod; O'Leary, Shane
Subject: Re: Progress photographs and project update

Thanks Hamish. Can you advise issues (if any) once you see revised production schedule.

Thanks

Neale Guthrie
General Manager
Venue and Event Services
Tourism, Sport and Events Division
Economic Development Directorate

02 6207 2294

Sent from my iPad

On 27/09/2012, at 8:07 AM, "McNulty, Hamish" <Hamish.McNulty@act.gov.au> wrote:

> Gents
>
> FYI
>
> Hamish
>
> Hamish McNulty | Executive Director |
> | Phone 02 6205 9674 | Fax 02 6207 0123 | Mobile 0418 619 057 |
> Infrastructure and Capital Works | Economic Development Directorate |
> ACT Government Level 6, TransACT House, 470 Northbourne Avenue Dickson

> ACT 2602 | GPO Box 158 Canberra ACT 2601 |
> www.economicdevelopment.act.gov.au
>
> P Please consider the environment before printing this e-mail.
>
>
> -----Original Message-----
> From: Chris Welbourn [mailto:cwelbourn@AbacusLighting.com]
> Sent: Wednesday, 26 September 2012 6:59 PM
> To: McNulty, Hamish
> Cc: Maginness, Ron; Tony Staten; Andrew Willetts; Andrew
> Morris-Richardson
> Subject: FW: Progress photographs and project update
>
> Hamish
>
> Please find attached photos of the head frame and mast. Sorry if they were not forwarded to yesterday.
>
> Dimensionally the head frame is very accurate and it looks. It has however taken significantly longer than we planned to design and manufacture the jigs for the head frame. Also the I beam for the man rider only arrived yesterday and was welded to the first mast sections last night.
>
> The result of this is that at this stage, realistically, we are now ensuring we have one complete mast on the first sailing on the 6th. Whilst this is desperately disappointing to me and all my team we are all confident that with all the technical manufacturing issues now resolved we can pull back the production to plan within the next two weeks. Also if necessary I will allocate more Abacus installation to the project if required to ensure the site build time is not adversely affected.
>
> Tony is out of the office today, but I will ask him to send a revised production plan across tomorrow when he has discussed the details with Andy Willetts our manufacturing manager.
>
> If you wish to discuss any issues raised please give me a call.
>
> Kind regards
>
> Chris
>
>
>
>
> For and on behalf of Abacus
> Lighting Ltd
>
> Chris Welbourn | Abacus Lighting
> Group Operations Director
>
>
> Oddicroft Lane,
> Sutton-in-Ashfield,
> Nottinghamshire, NG17 5FT, United Kingdom
> Tel: +44 1623 518 277 | Mob: +44 78875 55210
> Fax: +44 1623 523 277
>
>
> Visit Abacus at Lux Live 2012 | 6th - 7th November Stand E15, Earls
> Court, London
>

> www.abacuslighting.com | twitter.com/AbacusLighting
> mailto:cwelbourn@AbacusLighting.com
> -----Original Message-----
> From: Tony Staten
> Sent: 25 September 2012 17:15
> To: 'Greg Sutton'
> Cc: Rajesh Valera; Chris Welbourn; 'Brendan Read'; 'Mitch Halley'
> Subject: FW: Progress photographs
>
> Greg,
>
> Please find attached a photograph of a headframe assembled (not yet galvanised) together with two photographs of a mid shaft and two bases.
>
> Please pass on to whoever you think will be interested to see them in Australia (Ron & Hamish).
>
> Best regards
>
> For and on behalf of Abacus
> Lighting Ltd

> Tony Staten | Abacus Lighting
> Global Contracts Director
>
> Oddicroft Lane,
> Sutton-in-Ashfield,
> Nottinghamshire, NG17 5FT, United Kingdom
> Tel: +44 1623 518 226 | Mob: +44 7973 908 510
>
> Visit Abacus at Lux Live 2012 | 6th - 7th November Stand E15, Earls
> Court, London
>
> www.abacuslighting.com | twitter.com/AbacusLighting
> mailto:AStaten@AbacusLighting.com
>
> -----Original Message-----
> From: Chris Welbourn
> Sent: 25 September 2012 13:31
To: Tony Staten; John Lawson; Andrew Morris-Richardson
> Subject: Head Frame 1
>
>
>
>
>
> **********
> Abacus Lighting Limited
> Oddicroft Lane, Sutton in Ashfield, Nottinghamshire, UK, NG17 5FT Company Registration Number: 612235
> Telephone: +44 (0)1623 511 111 Fax: +44 (0)1623 552 133
> www.abacuslighting.com
>
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PLANNING
URBAN DESIGN
INTERIOR DESIGN

MANUKA OVAL – BROADCAST LIGHTING

PROJECT NO: 911037

SITE MEETING #3 – 10am Tuesday 11 September 2012 - Board Room – Manuka Oval

MINUTES OF MEETING

PRESENT:

- Don Gilson (Superintendent) – Cox Architecture
- Matthew Tokley - TVE
- Rod Florence – TVE
- Peter Rea – SSP
- Greg Sutton – Dialight ILS Australia
- Brendan Read and Mitch Halley – Affinity Electrical

APOLOGIES:

- Ron Maginness – EDD
- Ian Smith – Cox architecture

No.	Item	Notes and Actions	Due
1	Site Meetings	It was agreed that site meetings be conducted on a fortnightly basis on a Tuesday **morning** unless decided otherwise.	Noted
2	**Customer Meetings**	**Every Friday and alternative Tuesday until contract completion**	**Noted**
3	Program	Commencement : 20 August 2012 Contract Completion: 21 December 2012 **Contract works on track as per discussion at Customer meeting on Fri 7/9/12** **Affinity Electrical tabled a Proposed Staging plan indicating also layout positions for mast assembly. Plan to be issued electronically**	**Noted**
4	Authorities	• **Dialight ILS advised that discussions with a Certifier confirmed that a BA is not required for the poles however a BA is required for the perimeter fence works.** **Dialight to submit asap.** • **ACTEWAGL** **Ian Smith,s meeting with ACTEWAGL and Affinity clarified the requirements re the Substation layout. No Change to the DA drawing. Query outstanding to ACTEW re clearance to switchboard. Superintendent to follow up.** • Construction Certificate/Certifier: Contractor to appoint. • **Dialight advised that ACTEW had advised that they would be installing the earthmat. The meeting agreed that it would be preferred to have the work under the control of the contractor.** **Superintendent to clarify with ACTEW.**	**14.09.12** **13.09.12** **12.09.12**

Cox Architecture Pty Ltd
ACN 002 535 891
Nominated Architects
Graham Humphries No. 718
Rodney Moss No. 846
22 Jardine Street
Kingston ACT 2604 Australia
T + 61 2 6239 6255
www.coxarchitecture.com.au

5	Documentation	**Shop Drawings reviewed .** **Dialight confirmed that the height of the masts may vary marginally but the height of the plinths above ground will not vary.**	**Noted**
7	RFIs	Register of RFIs indicating Current Status to be tabled at each Site Meeting by Cox. **Superintendent noted that no RFI's have been submitted to date other than the 3 recorded at the last site meeting.** RFI 1: Meeting with ACTEW inspector still to be arranged. RFI 2: setout point established RFI 3: Is conduit for comms required between T1 & T2. Conduit proposed to give future flexibility. **Yes.** **Dialight advised they would be sending some RFI's this week.** • **Plinth design** • **Switchboard layout for each light pole** • **Colour of Switchboards and poles**	
8	Contract	Formal Contract: Draft being prepared by Cox with SSP input. **Superintendent advised that he was hopeful of completing by end of this week.**	**14.09.12**
9	Payments	It was noted that a table of projected payment has been agreed with SSP and the Superintendent is required to review and issue certification. **It was noted that the first payment has been made .**	
10	Site Instructions	Register of Directions current status to be tabled at each Site Meeting by Cox. **Nil to date.** **Instruction to be given for Layout of each set of Electrical and comms boards by end of this week.**	**14.09.12**
11	Variations	Request by Superintendent for early advice if the Contractor believes that there is any possible variation claim arising from directions given or from any unforeseen latent condition. Register of Current Status each Site Meeting by Cox. **Nil to Date** **Superintendent to issue recommendation to SSP for order to be issued**	Noted
12	Extensions of Time	Register of Extensions of Time to be tabled at each Site Meeting by Cox. **Nil to date**	Noted

13	Other Business	Site Access: Containers with Sections of masts. **TVE advised that agreement has been reached with the club re use of the site for storage of containers during construction for $100/week. It was agreed that TVE will pick up these costs** **Dialight to provide:** • **Shipping dates for issuing to TVE** • **Padlocks for gate/s** • **Photo record of site prior to first container arrival** • **Signage to alert TVE clients and public of temporary use of site**	**Noted**
14	Next Meeting	**9am Tuesday 25 September 2012 at Manuka Oval in meeting area adjacent to Matthew Tokley's office.**	**Noted**

COMMUNICATIONS MANAGEMENT PLAN

MANUKA OVAL SPORTS LIGHTING

ECONOMIC DEVELOPMENT DIRECTORATE (EDD)

TABLE OF CONTENTS

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COMMUNICATIONS MANAGEMENT APPROACH 2
ROLES 2
PROJECT TEAM DIRECTORY 4
PROJECT COMMUNICATION PATH 5
COMMUNICATIONS MATRIX 6

INTRODUCTION

The purpose of the Communications Management Plan is to define the communication requirements for the project and how information will be distributed. The Communications Management Plan defines the following:

- communication requirements based on roles;
- what information will be communicated;
- how the information will be communicated;
- when will information be distributed;
- who does the communication; and
- who receives the communication.

This Communications Management Plan sets the communications framework for this project. It will serve as a guide for communications throughout the life of the project and will be updated as communication needs change. This plan identifies and defines the roles of persons involved in this project. It also includes a communications matrix which maps the communication requirements of this project. An in-depth guide for conducting meetings details both the communications rules and how the meetings will be conducted, ensuring successful meetings. A project team directory is included to provide contact information for all stakeholders directly involved in the project.

COMMUNICATIONS MANAGEMENT APPROACH

The Superintendent will take a proactive role in ensuring effective communications on this project. The communications requirements are documented in the Communications Matrix presented in this document. The Communications Matrix will be used as the guide for what information to communicate, who is to do the communicating, when to communicate it and to whom to communicate.

ROLES

Project Sponsor

The Project Sponsor is the champion of the project and has authorised the project. This person is responsible for the funding of the project and is ultimately responsible for its success.

Capital Works Manager

The Capital Works Manager spends most of the time measuring and reporting on the performance of the project, composing and reading emails, conducting meetings, meeting with team members, overseeing work being performed by the Superintendent.

Project Officer

The Project Officer oversees the project at the portfolio level and owns most of the resources assigned to the project. The Project Officer is responsible for overall program costs and profitability as such they require more detailed communications than the Project Sponsor.

Key Stakeholders
Normally Stakeholders includes all individuals and organisations that are impacted by the project. For this project we are defining a subset of the stakeholders as Key Stakeholders. These are the stakeholders with whom we need to communicate with and are not included in the other roles defined in this section. The Key Stakeholders includes executive management with an interest in the project and key users identified for participation in the project.

Customer
The customer for this project is Territory Venues and Events (TVE). As the customer who will be accepting the final deliverable of this project they will be informed of the project status including potential impacts to the schedule for the final deliverable or the product itself.

Superintendent
The Superintendent has overall responsibility for the execution of the project. The Superintendent manages day to day resources, provides project guidance and monitors and reports on the projects metrics as defined in the Project Management Plan. As the person responsible for the execution of the project, the Superintendent is the primary communicator for the project distributing information according to this Communications Management Plan.

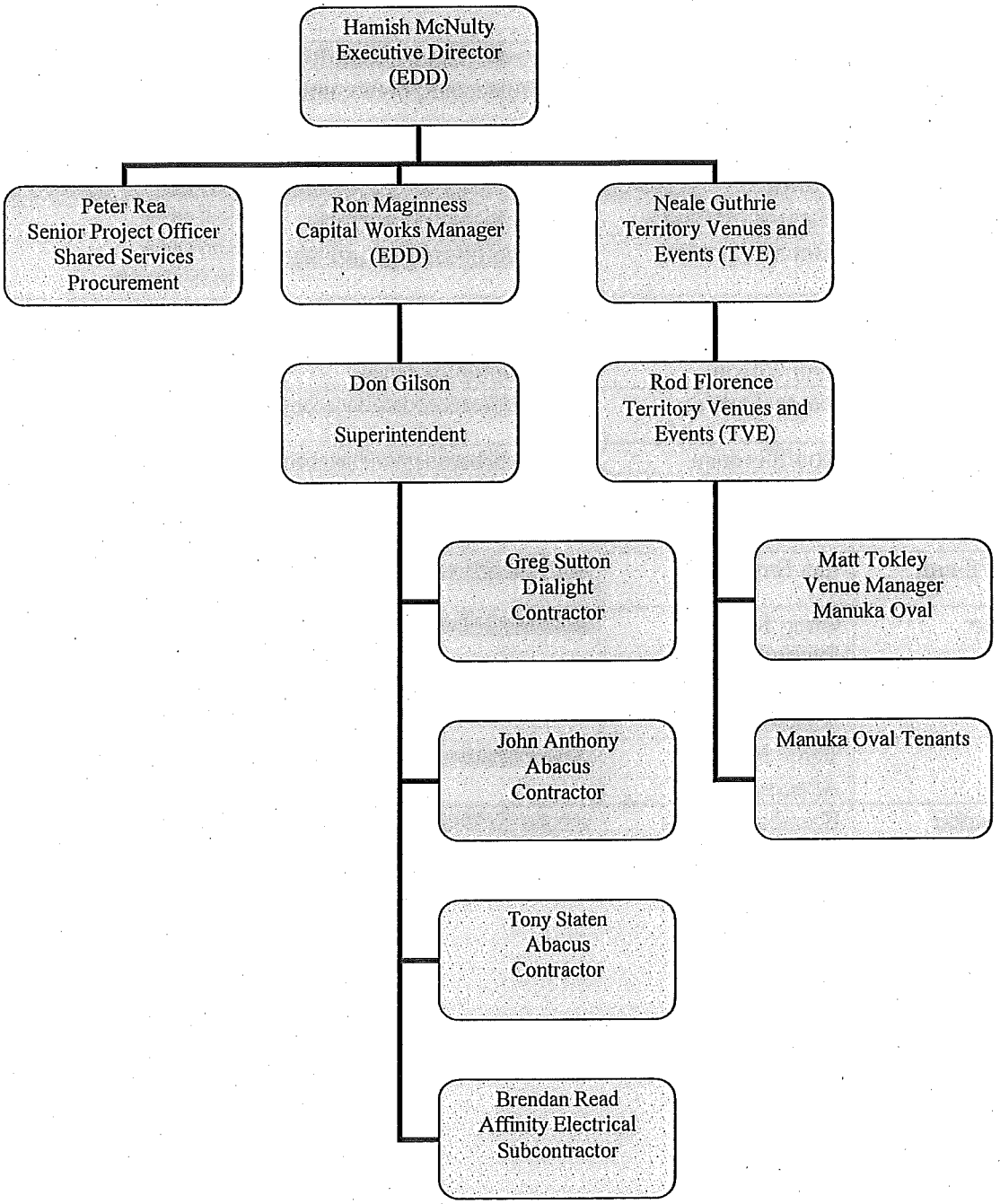
Technical Lead
The Technical Lead is a person on the Project Team who is designated to be responsible for ensuring that all technical aspects of the project are addressed and that the project is implemented in a technically sound manner. The Technical Lead is responsible for all technical designs, overseeing the implementation of the designs and developing as-build documentation. The Technical Lead requires close communications with the Capital Works Manager, Project Officer and the Superintendent.

PROJECT TEAM DIRECTORY

The following table presents contact information for all persons identified in this communications management plan. The email addresses and phone numbers in this table will be used to communicate with these people.

Role	Name	Email	Phone
Project Sponsor	Hamish McNulty	Hamish.McNulty@act.gov.au	6205 9674
Capital Works Manager	Ron Maginness	ron.maginness@act.gov.au	6207 9035 0418 628 649
Project Officer	Peter Rea	peter.rea@act.gov.au	6205 4292 0435 966 887
Superintendent	Don Gilson	Don.Gilson@cox.com.au	6239 6255
Customer	Neale Guthrie	n.guthrie@canberrastadium.com	6256 6708 0410 515 068
	Rod Florence	r.florence@canberrastadium.com	6256 6713 0408 649 787
	Matt Tokley	matthew.tokley@aflnswact.com.au	6228 0304 0406 376 700
Technical Lead	Ian Smith	Ian.Smith@cox.com.au	6239 6255 0437 037 981
Contractor	Greg Sutton - Dialight	gsutton@dialight.com.au	(02) 9679 2623 0419 917 880
	John Anthony – Abacus	janthony@abacuslighting.com	(0)7770 730 442
	Tony Staten - Abacus	AStaten@abacuslighting.com.au	Wk 0011 441323518226 Mob 0011 44 7973908510
Subcontractor	Brendan Read – Affinity Electrical	brendan@affinityelectrical.com.au	0414 441 134

PROJECT COMMUNICATION PATH



COMMUNICATIONS MATRIX

The following table identifies the communications requirements for this project.

Communication Type	Objective of Communication	Medium	Frequency	Audience	Owner
Kickoff Meeting	Introduce the project team and the project. Review project objectives and management approach.	• Face to Face	Once	• Project Sponsor • Project Team • Stakeholders	Superintenden
Project Team Meetings	Review status of the project with the team.	• Face to Face • Conference Call	Weekly	• Project Team	Superintenden
Technical Design Meetings	Discuss and develop technical design solutions for the project.	• Face to Face	As Needed	• Project Technical Staff	Technical Lea
Monthly Project Status Meetings	Report on the status of the project to management.	• Face to Face • Conference Call	Monthly	• PO •	Superintenden
Project Status Reports	Report the status of the project including activities, progress, costs and issues.	• Email	Monthly	• Project Sponsor • Project Team • Stakeholders • PO	Superintenden

Rea, Peter

From: Lee Dye [ldye@AbacusLighting.com]
Sent: Thursday, 6 September 2012 1:49 AM
To: Ian Smith; Reynolds, ChrisB (Canberra Stadium); Florence, Rod
Cc: John Anthony; Stuart Harper; Don Gilson; Maginness, Ron; Rea, Peter; Florence, Rod; Gordon Humphreys; Dean Hargreaves; Chris Welbourn; 'Phillip.Greenup@arup.com.au'; Greg Sutton
Subject: RE: Manuka Lighting - Tower Access

Hi Ian,

Has there been any update on the bird scarer info? We need to finalise the positioning and bracketry required ASAP.

Thanks,

For and on behalf of Abacus Lighting Ltd

Lee Dye | Abacus Lighting
Project Engineer

Oddicroft Lane, Sutton-in-Ashfield,
Nottinghamshire, NG17 5FT, United Kingdom
Tel: +44 1623 518 286
Fax: +44 1623 523 286

Visit Abacus at Lux Live 2012 | 6th - 7th November
Stand E15, Earls Court, London

www.abacuslighting.com | twitter.com/AbacusLighting
ldye@abacuslighting.com

From: Ian Smith [mailto:Ian.Smith@cox.com.au]
Sent: 25 August 2012 05:44
To: Lee Dye; Chris Reynolds; Florence, Rod
Cc: John Anthony; Stuart Harper; Don Gilson; Maginness, Ron; Peter Rea (Peter.Rea@act.gov.au); Rod.Florence@act.gov.au; Gordon Humphreys; Dean Hargreaves; Chris Welbourn; 'Phillip.Greenup@arup.com.au'; Greg Sutton
Subject: RE: Manuka Lighting - Tower Access

Thanks Lee,

Rod. Can you please relay to your team and advise if there is anything that is of further issue.

Chris R., can you advise on Item 6 below?

Cheers,

IS.

Ian Smith - Director

COX

Cox Architecture
22 Jardine Street, Kingston ACT 2604 Australia
E: Ian.Smith@cox.com.au | T: +61 2 6239 6255 | M: +61 437 037 981 | W: coxarchitecture.com.au | Disclaimer

---

From: Lee Dye [mailto:ldye@AbacusLighting.com]
Sent: Friday, 24 August 2012 9:02 PM
To: Ian Smith; Greg Sutton
Cc: John Anthony; Stuart Harper; Don Gilson; Maginness, Ron; Peter Rea (Peter.Rea@act.gov.au); Rod.Florence@act.gov.au; Florence, Rod; Gordon Humphreys; Dean Hargreaves; Chris Welbourn
Subject: RE: Manuka Lighting - Tower Access

Hi Ian,

See below our answers and further comments in red.

Regards,

For and on behalf of Abacus Lighting Ltd

Lee Dye | Abacus Lighting
Project Engineer

Oddicroft Lane, Sutton-in-Ashfield,
Nottinghamshire, NG17 5FT, United Kingdom
Tel: +44 1623 518 286
Fax: +44 1623 523 286

www.abacuslighting.com | twitter.com/AbacusLighting
ldye@abacuslighting.com

From: Ian Smith [mailto:Ian.Smith@cox.com.au]
Sent: 20 August 2012 10:02
To: Gordon Humphreys; Greg Sutton
Cc: John Anthony; Lee Dye; Stuart Harper; Don Gilson; Maginness, Ron; Peter Rea (Peter.Rea@act.gov.au); Rod.Florence@act.gov.au; Florence, Rod
Subject: RE: Manuka Lighting - Tower Access

Hi Gordon,

Rod Florence organised a meeting with his operations people this morning to agree a response to your query regarding fall arrest systems below.

The upshot of this was that they feel that a static line permanent system with associated running gear would be desirable for the move from the man rider up to the platform, and up the ladder to the top of the head frame (managing a twin lanyard system while moving up a ladder will be difficult) – preferably as one run if this can be achieved, but potentially you will need to break the line due to the hatch in the platform? A twin lanyard system for accessing the lateral catwalks from the central ladder will be fine.

As discussed in our teleconference on Wednesday, we are currently investigating a system whereby we can use a single static line that negotiates the bend in the ladders.

Some other queries that arose in the discussion which I hope you can answer include:

1. How heavy is the man rider and how is it moved? Can it have forklift slots to aid moving long distances? The unit weighs approx 245kg and is equipped with wheels for portability. See attached.

2. Does the manrider have safety switches to prevent it being winched up until it is properly affixed to the pole? Yes.
3. The documents call up training and operations manuals for the use of the manrider. Please confirm these will be provided. Confirmed.
4. Will the man rider be custom engineered for the inclined tower? That is, on the 7.5 degree incline we anticiapte that the floor will be horizontal. See attached. An angled flooring is placed in the bottom to counteract the mast incline.
5. Suggest a wind gauge is mounted on top of tower to ensure that poles are not accessed when it is too windy. We would suggest not using the man-rider at wind speeds of around 5 m/s at 10m. It would make more sense to have a wind gauge mounted at rooftop level of one of the stands rather than fixing to the top of the masts.
6. Please confirm specified reflective prism bird scarer will be installed on each tower. This is fine, but we will need full details as to what this prism is to ensure any required bracketry is incorporated into the headframe. Do you have any drawings/product data sheets? Whereabouts is the prism to be located?
7. How is the spotlight glass cleaned? Do the fitting pivot for ease of access? The floodlights, once aimed, should not be pivoted or moved. Cleaning is achieved by reaching around from the rear, which shouldn't be a problem given the catwalk system we have in place.
8. Will the rollers mark the pole, especially if paint finished? We don't anticipate any marking of the mast.
9. How are you going confirming the access system will comply with local standards and codes, including requirement for regular inspection (6 monthly or annually?). We are happy that the access system proposed does not contradict any of the local standards you have supplied.

Cheers,

IS.

Ian Smith - Director

COX

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From: Gordon Humphreys [mailto:ghumphreys@AbacusLighting.com]
Sent: Thursday, 16 August 2012 1:42 AM
To: Ian Smith; Greg Sutton
Cc: John Anthony; Lee Dye; Stuart Harper; Don Gilson; Maginness, Ron; Peter Rea (Peter.Rea@act.gov.au); Rod.Florence@act.gov.au; Florence, Rod
Subject: RE: Manuka Lighting - Tower Access

Hi Ian,

I agree that the rail clamp looks cumbersome – this was a drawing from the personnel lift supplier and we made the same comment when we saw it. We'll probably work on the basis of bolting directly through the flange into the shaft and could use countersunk bolts for this. The difficulty is that we can't bolt though the shaft in the overlap areas.

Having three ladders radiating up the headframe is less practical now that the headframe is wider at the top and the lights are more spread out. The required sideways reach from the ladder would be too great. I'm also not comfortable with a ladder which slopes sideways too much (although this isn't specifically precluded in the standards).

The fall arrest systems options are as follows;

- A permanently installed system whereby the operative has a sliding chuck device attached to their harness which is then attached to a stainless steel wire. Systems exist for both vertical ladders and horizontal runs. I don't know what systems are used in Australia but in the UK this is one example. The advantage is that on a long run of ladder or walkway the operative doesn't need to unclip and reclip to bypass brackets. The

downside is that a stock of devices must be kept and the whole system must be inspected and maintained annually.

- The operative has two lanyards attached to their harness (generally via a shock absorber). On the end of each lanyard is a large clip which can be attached to any suitable anchorage point. This allows the operative to move around whilst keeping one lanyard attached at all times. This is a simple approach but on long ladders and traverses it can be awkward.

Personally, I would favour the lanyard approach. On short runs (say less than 20m) the advantages of a permanent fall arrest are lost and the simplicity of lanyards becomes preferable. Unless instructed otherwise we will work on this basis.

The catwalk proposal I think would be quite discreet. See attached sketchs showing the layout. The catwalk is around 200mm wide and is curved to follow the line of the horizontal. A handrail is provided on the underside of the horizontal above to hold on to and to attach a lanyard.

Regards,

Gordon

For and on behalf of Abacus Lighting Ltd

Gordon Humphreys | Abacus Lighting
Mechanical Design Manager

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From: Ian Smith [mailto:Ian.Smith@cox.com.au]
Sent: 15 August 2012 01:28
To: Gordon Humphreys; Greg Sutton
Cc: John Anthony; Lee Dye; Stuart Harper; Don Gilson; Maginness, Ron; Peter Rea (Peter.Rea@act.gov.au); Rod.Florence@act.gov.au; Florence, Rod
Subject: RE: Manuka Lighting - Tower Access

Hi Gordon,

See below for my comments.

Cheers,

IS.

Ian Smith - Director

COX

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From: Gordon Humphreys [mailto:ghumphreys@AbacusLighting.com]
Sent: Wednesday, 15 August 2012 1:29 AM
To: Ian Smith; Greg Sutton
Cc: John Anthony; Lee Dye; Stuart Harper; Don Gilson; Maginness, Ron; Peter Rea (Peter.Rea@act.gov.au); Rod.Florence@act.gov.au
Subject: RE: Manuka Lighting - Tower Access

Ian,

Thank you for the feedback. We'll look at how best to incorporate the banner brackets with the rail. The problem with welding the rail directly to the shaft as a T-section is that the shafts are nested together for shipping. Since shipping is a major cost we need to have the rail detachable. This isn't an insurmountable problem though and we'll work out a solution easily enough. Understood on the nesting of the tower segments. I still think we can improve on your detail by using a cut down universal column or similar and bolting directly without the clamp detail you were suggesting, and also thing about countersunk fixings rather than basic bolts. The elements clos tot he ground are the most critical in terms of how the tower present to the public.

We are looking at the access provision up the rear of the headframe. Can you advise what you envisaged the layout would be? We are working along the lines of having a central ladder going up the full height with narrow catwalks behind each horizontal for traversing out to each fitting. Ideally an operative needs to be able access each fitting and have both hands free for working. Should we use a fixed fall arrest system or assume the use of double lanyards? We had drawn a single ladder, but would prefer to not see gantries across the back of the head frame if we can avoid it. The triple ladder arrangement fanning out from the access platform you had shown in your tender drawings looks like a pretty good solution to us because it would minimise the structure on the head frame but provide ready access to each fitting? If this is not compliant with access codes, how wide would the catwalks be, and would they have handrails etc.? I don't know the difference between a fixed fall arrest system and double lanyards so can't comment on that aspect sorry. Roof access systems her tend to have a fixed cable that a worker can hook into with a harness if that helps. Rod, do you or your team have a view?

Regards,

Gordon

For and on behalf of Abacus Lighting Ltd

Gordon Humphreys | Abacus Lighting
Mechanical Design Manager

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From: Ian Smith [mailto:Ian.Smith@cox.com.au]
Sent: 14 August 2012 09:58
To: Gordon Humphreys; Greg Sutton
Cc: John Anthony; Lee Dye; Stuart Harper; Don Gilson; Maginness, Ron; Peter Rea (Peter.Rea@act.gov.au);

Rod.Florence@act.gov.au
Subject: RE: Manuka Lighting - Tower Access

Hi Gordon,

See below comments in red and attached sketches. I hope these suggestions are clear and achievable, but please call if you have any queries.

Note any future RFIs need to now formally go through Don Gilson as the Contract Superintendent, but you can Cc me in directly to ensure the quickest possible turnaround.

Cheers,

IS.

Ian Smith - Director

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From: Gordon Humphreys [mailto:ghumphreys@AbacusLighting.com]
Sent: Tuesday, 14 August 2012 1:35 AM
To: Greg Sutton; Ian Smith
Cc: John Anthony; Lee Dye
Subject: FW: Manuka Lighting - Tower Access

Greg / Ian,

Thank you for confirming the access method on the masts. There are a few issues with using the lift system listed below which I would appreciate your comment on.

Many thanks,

Gordon

For and on behalf of Abacus Lighting Ltd

Gordon Humphreys | Abacus Lighting
Mechanical Design Manager

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From: Lee Dye
Sent: 13 August 2012 13:12
To: Gordon Humphreys
Subject: RE: Manuka Lighting - Tower Access

Gordon,

List of points for comment by Cox/Dialight:

- The two winch cables for the personnel lift on a sloped mast have to be permanently under tension on the outside of the mast. This means there will be cable within reach of the public that could be open to vandalism/misuse. An option would be to suspend the cable higher up the mast, then use a ladder to release it for the lift operation. Please confirm your preference on how to manage this. Cables should be terminated out of reach at about 3.5m above ground with ladder used to access. Suggest cables run in man-rider guide rail with termination points clearing rollers as per attached sketch to conceal and reduce movement from wind. Refer to attached alternate guide rail details.
- The lift effectively "hugs" the mast as it ascends, meaning any banners would have to be removed prior to operation. It would also mean that because the guide rail for the lift is mounted centrally to the rear of the mast, any banners would have to mounted offset from the centre. Please define locations for the banner pole fixing positions (height from GL, distance apart, orientation relative to CL of mast, etc.). Understood how the carriage works. Attached sketches show how two banner poles might be fixed into guide rail without impeding rider, and so rider could be used to access banner to install and remove. Requires a heavy gauge web to track to allow tapping into it without creating obstructions, or if the rider rollers are spring loaded, they could roll over a threaded tube inserted in the web to avoid the whole thing being heavy gauge. Attached sketches show desired position and size – one each per pole.
- There will have to be a small ladder (approx 2m in length) that negotiates the knuckle joint up to the platform, as this will be inaccessible for the personnel lift. Due to the fall-arrest cable, the ladder cannot be curved to follow the knuckle profile, although we will endeavour to make it as inconspicuous as possible. I do not fully understand why cable affects ladder, but we look forward to seeing shop drawings which I gather you are targeting completing end of this week so we can review and comment if required.
- The guide rail for the lift cannot be made in one piece, and as such will be supplied in separate lengths of approx 6m and bolted to the shaft. Due to the nature of the overlap slip joints, there will have to be gaps in the rail to allow for settlement once the mast has been installed upright. Shafts tend to settle by up to 50mm once installed, so there would have to be design gaps in the rail to allow for this. It may have ramifications on the overall visual impact of the mast. Understood on the need to leave room for settlement. Can the guide rail also have a slip joint so it reads continuous from the ground? Your proposed fixing detail looks pretty agricultural. See attached suggested alternate details for track, including welding the track to pole, or at least using a cut down universal column so that you avoid the suggested cleat and bolt detail, eliminating the cleat.

Regards,

For and on behalf of Abacus Lighting Ltd

Lee Dye | Abacus Lighting
Project Engineer

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ldye@abacuslighting.com

From: John Anthony
Sent: 12 August 2012 03:57

To: Ian Smith; Lee Dye; Gordon Humphreys; Neil McClymont
Cc: Ron.Maginness@act.gov.au; Greg Sutton; Florence, Rod; Rea, Peter; Tony Staten; Chris Welbourn
Subject: RE: Manuka Lighting - Tower Access

Thanks Ian,

We confirm that the man rider will be the means of head frame access. Gordon will prepare the detailed drawings for this and submit.
Hope to meet you on Monday or Tuesday this week during my visit to Canberra with Greg Sutton of ILS and Abacus Contracts Director Tony Staten. John

For and on behalf of Abacus Lighting

John Anthony | Abacus Lighting
Export Sales Director

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email janthony@abacuslighting.com

twitter.com/AbacusLighting

From: Ian Smith [mailto:Ian.Smith@cox.com.au]
Sent: 12 August 2012 03:23
To: John Anthony; Lee Dye; Gordon Humphreys; Neil McClymont
Cc: Ron.Maginness@act.gov.au; Greg Sutton; Florence, Rod; Rea, Peter
Subject: Manuka Lighting - Tower Access

Dear John,

I am confirming on TVE and SSP's behalf that the man-rider is to be the access approach adopted at Manuka. Please confirm,

Cheers,

IS.

Ian Smith - Director

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Rea, Peter

From: Ian Smith [Ian.Smith@cox.com.au]
Sent: Tuesday, 4 September 2012 5:27 PM
To: Greg Sutton
Cc: Mitch Halley; Brendan Read; Tokley, Matthew; Don Gilson; Maginness, Ron; Tony Staten; McNulty, Hamish; Rea, Peter
Subject: RE: Manuka oval Construction Programme

Hi Greg,

Point taken on the lines of communication, but when I spoke to you I did not get the sense that you were across the situation on the ground, and you seemed happy for me to contact Affinity to get their take. As it was their explanations varied from yours so I was none the wiser.

All that aside, as you'd appreciate basically we need to see an integrated program which is closely adhered to. This will give everyone more confidence of a delivery on time, and people will be able to chill out a bit. Any progress on this please?

Cheers,

.3.

Ian Smith - Director

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From: Greg Sutton [mailto:gsutton@dialight.com.au]
Sent: Monday, 3 September 2012 8:48 PM
To: Ian Smith; Mitch Halley; Brendan Read; matthew.tokley@aflnswact.com.au; Don Gilson; Ron.Maginness@act.gov.au; Tony Staten; McNulty, Hamish; Rea, Peter
Subject: RE: Manuka oval Construction Programme

'an,
I outlined the issues with the piling contractor earlier today over the phone and the reason drilling has not started, please address any further queries to me directly.
I will update you with the points below as soon as possible.

Regards
Greg Sutton
0419 917 880

From: Ian Smith [mailto:Ian.Smith@cox.com.au]
Sent: Monday, 3 September 2012 3:09 PM
To: Mitch Halley; Greg Sutton; Brendan Read; matthew.tokley@aflnswact.com.au; Don Gilson; Ron.Maginness@act.gov.au; Tony Staten; McNulty, Hamish; Rea, Peter
Subject: RE: Manuka oval Construction Programme

Hi Mitch,

Thanks for this. I will review in detail with Don, but in the interim can you advise on the following:

- Does this program dovetail with Abacus' timing to avoid any delays to them? Please confirm/add their activities to this program;

- Does the boring for cabling start this Thursday?;
- Why is the piling boring not starting until 17 Sept? Couldn't that start now too, ahead of the rag bolt assembly arriving?; and
- Again, why can't the sub excavation start sooner?

Could you please send me the MS Project file in 2003 format?

Thanks,

IS.

Ian Smith - Director

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From: Mitch Halley [mailto:Mitch@affinityelectrical.com.au]
Sent: Monday, 3 September 2012 2:14 PM
To: Greg Sutton; Brendan Read; Ian Smith; matthew.tokley@aflnswact.com.au; Don Gilson; Ron.Maginness@act.gov.au
Subject: Manuka oval Construction Programme

Hi All,

Please find attached Affinity Electricals detailed Construction Programme.

We pushed back the Start date of the Civil so we could have all possible issues worked out so we had no interruptions during this process.

Please view the program and let me know if there any issues we may have miss during our planning.

Please call if there are any questions I can answer.

Regards

Mitch Halley
Project Estimator

affinityelectrical technologies

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f 6241 3266
e mitch@affinityelectrical.com.au
a 53 Grimwade street mitchell, act 2911
www.affinityelectrical.com.au

Rea, Peter

From: Don Gilson [Don.Gilson@cox.com.au]
Sent: Tuesday, 4 September 2012 2:02 PM
To: Greg Sutton
Cc: Maginness, Ron; Rea, Peter; Ian Smith
Subject: RE: ActewAgl Lead in Conduits

Greg,
I can find no reference to a % for oncosts to variations in the documentation but the 15% requested by Mitch is a bit excessive. I have spoken to a local QS who has advised that 10-12% is more appropriate. Unless I receive a convincing argument to the contrary I will apply the 12% to the NDA price for the variation.
Regards

Don Gilson - Senior Architect

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From: Greg Sutton [mailto:gsutton@dialight.com.au]
Sent: Tuesday, 4 September 2012 12:01 PM
To: Don Gilson
Subject: FW: ActewAgl Lead in Conduits

Don,
Please see the attached email and quote.

Regards
Greg Sutton
0419 917 880

From: Mitch Halley [mailto:Mitch@affinityelectrical.com.au]
Sent: Tuesday, 21 August 2012 7:57 AM
To: Greg Sutton
Subject: ActewAgl Lead in Conduits

Hi Greg,
Please see attached Quote from NDD for the work involve for the ActewAgl Lead in conduit work. AET will ask for 15% to manage this process. Can you please send over to Ron McGuiness from ACT Government for the approval.

If it gets approved I would like to do this work first, so Actew can complete as soon as the plinth is built.

Regards

Mitch Halley
Project Estimator

affinityelectrical technologies

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Rea, Peter

From: Ian Smith [Ian.Smith@cox.com.au]
Sent: Tuesday, 4 September 2012 6:52 AM
To: Gordon Humphreys; Lee Dye
Cc: John Anthony; 'gsutton@dialight.com.au'; Don Gilson; Agnieszka Liso; Maginness, Ron; 'Phillip.Greenup@arup.com.au'; Chris Welbourn; Steve Forster; John Lawson; Dean Hargreaves; Andrew Willetts; Tony Staten; Stuart Harper; Rea, Peter
Subject: RE: Manuka mast heights (Abacus ref 45508)

Thanks Gordon,

I have nothing further to contribute. Please press on.

Cheers,

IS.

Ian Smith - Director

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From: Gordon Humphreys [mailto:ghumphreys@AbacusLighting.com]
Sent: Monday, 3 September 2012 10:37 PM
To: Ian Smith; Lee Dye
Cc: John Anthony; 'gsutton@dialight.com.au'; Don Gilson; Agnieszka Liso; 'Ron.Maginness@act.gov.au'; 'Phillip.Greenup@arup.com.au'; Chris Welbourn; Steve Forster; John Lawson; Dean Hargreaves; Andrew Willetts; Tony Staten; Stuart Harper; Rea, Peter
Subject: RE: Manuka mast heights (Abacus ref 45508)

Hi Ian,

With reference to your comments below;

1) No problem. We'll pull the front edge of the cladding back a little.

2) We'll bring the cladding in as much as possible in the ladder area but do need to make sure that the access up the ladder isn't obstructed. Note that AS1657 requires at least 200mm clear space behind the ladder.

3) Our proposal has always been to use faceted shafts and this has been shown on all of our drawings. There is no option to use circular sections.

4) The 'ladder' bracket at the base of the headframe is principally a lifting point, hence it's bulk. The point of attachment of the ladder could possibly be pushed in a bit to slightly hide the ladder but the bracket does need to be that size in order to pass the lifting slings through.

And the comments in the fabrications drawings....

IM200/101/6/1; Lifting point. As above (4).

IM200/101/9/1; The ladder attachment brackets need to be able to withstand the vertical load from the climbers and potential fall arrest loads. For this reason the slim attachment brackets you suggest aren't really viable. The

attached image is a realistic view from ground level of the headframe – The current ladder brackets really aren't visible in my opinion.

IM200/101/2/1; The lug at the base of the mast is for the anchorage of the lifting slings so is quite necessary. The frame for the door is there to replace the strength in the tube lost from the cut-out. If it were pushed in it would be less effective. It was my understanding that the bases of the masts will be surrounded by enclosures – is this not the case?

IM200/101/8/4; As with the door frame in the base section, this protruding frame is necessary to maintain strength and it becomes ineffective if push inwards. The protrusion is only 15mm and has been orientated on the inside rear of the frames for minimal visual impact.

Regards,

Gordon

For and on behalf of Abacus Lighting Ltd

Gordon Humphreys | Abacus Lighting
Mechanical Design Manager

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From: Ian Smith [mailto:Ian.Smith@cox.com.au]
Sent: 03 September 2012 06:35
To: Lee Dye
Cc: John Anthony; 'gsutton@dialight.com.au'; Don Gilson; Agnieszka Liso; 'Ron.Maginness@act.gov.au'; 'Phillip.Greenup@arup.com.au'; Chris Welbourn; Steve Forster; John Lawson; Dean Hargreaves; Andrew Willetts; Tony Staten; Stuart Harper; Gordon Humphreys; Rea, Peter
Subject: RE: Manuka mast heights (Abacus ref 45508)

Hi Lee,

We have reviewed your screen shots. Refer to attached mark-ups. We offer the following comments:

1. Knuckle cladding is looking good. Only request is that the front profile looks to bulge forward a bit too much. Can you pull this back a bit to pick up the profile of the lights more closely as per sketch?

2. Related to this, please look to wrap the cladding as far around as possible to encompass the top of the pole and conceal the ladder as much as possible.

3. Our understanding was that the poles would be tapered circular sections, not faceted, and that to date you had been showing the faceted pole indicatively. However, shop drawings received separately show poles faceted. Please confirm your intent. If faceted, is there any way we can achieve a CHS? Faceted poles will significantly impact the visual style of the whole design.

4. This may fall into the "we haven't designed it yet" category, but it looks as though if you add a bracket to the ladder at the main CHS flange connection point you will be able to subtly change its angle at the base and reduce the associated base bracket size substantially. Please look at this because current brackets are really bulky. If this is not possible the bracket should instead be open frames rather than solid plates.

Hope all this is clear, and happy to discuss. I will look at the shop drawings now, but do not anticipate any additional comments.

Cheers,

IS.

Ian Smith - Director

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From: Lee Dye [mailto:ldye@AbacusLighting.com]
Sent: Friday, 31 August 2012 11:32 PM
To: Ian Smith
Cc: John Anthony; 'gsutton@dialight.com.au'; Don Gilson; Agnieszka Liso; 'Ron.Maginness@act.gov.au'; od.Florence@act.gov.au'; 'Phillip.Greenup@arup.com.au'; Chris Welbourn; Steve Forster; John Lawson; Dean Hargreaves; Andrew Willetts; Tony Staten; Stuart Harper; Gordon Humphreys
Subject: RE: Manuka mast heights (Abacus ref 45508)

Ian,

Please find attached same views including floodlights.

Regards,

For and on behalf of Abacus Lighting Ltd

Lee Dye | Abacus Lighting
Project Engineer

Oddicroft Lane, Sutton-in-Ashfield,
Nottinghamshire, NG17 5FT, United Kingdom
l: +44 1623 518 286
Fax: +44 1623 523 286

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ldye@abacuslighting.com

From: Ian Smith [mailto:Ian.Smith@cox.com.au]
Sent: 31 August 2012 13:13
To: Lee Dye
Cc: Gordon Humphreys
Subject: Re: Manuka mast heights (Abacus ref 45508)

Hi Lee,

Can you send same views with spot lights on frame?

Thanks,

IS.

From: Lee Dye
Sent: 31 August 2012 09:10
To: 'Ian Smith'
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Sent: 30 August 2012 09:24
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Cc: John Anthony; 'gsutton@dialight.com.au'; Don Gilson; Agnieszka Liso; 'Ron.Maginness@act.gov.au'; 'Rod.Florence@act.gov.au'; 'Phillip.Greenup@arup.com.au'; Chris Welbourn; Steve Forster; John Lawson; Dean Hargreaves; Andrew Willetts; Tony Staten; Stuart Harper
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Hi Gordon,

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Ron is packing his bag in readiness for a visit (aka junket) to check out your handiwork in person – I think he plans to be there in a two to three weeks. What's he likely to see?

I'll be keen to hear what the consistency of the galvanised finish is like because we are still discussing the pros and cons of post finishing the towers at this end. The decision will depend in part on the regularity of the gal finish.

Cheers,

IS.

Ian Smith - Director

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Sent: Thursday, 30 August 2012 6:14 PM
To: Ian Smith; Lee Dye
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Gordon

For and on behalf of Abacus Lighting Ltd

Gordon Humphreys | Abacus Lighting
Mechanical Design Manager

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Nottinghamshire, NG17 5FT, United Kingdom
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Thanks, and all the best.

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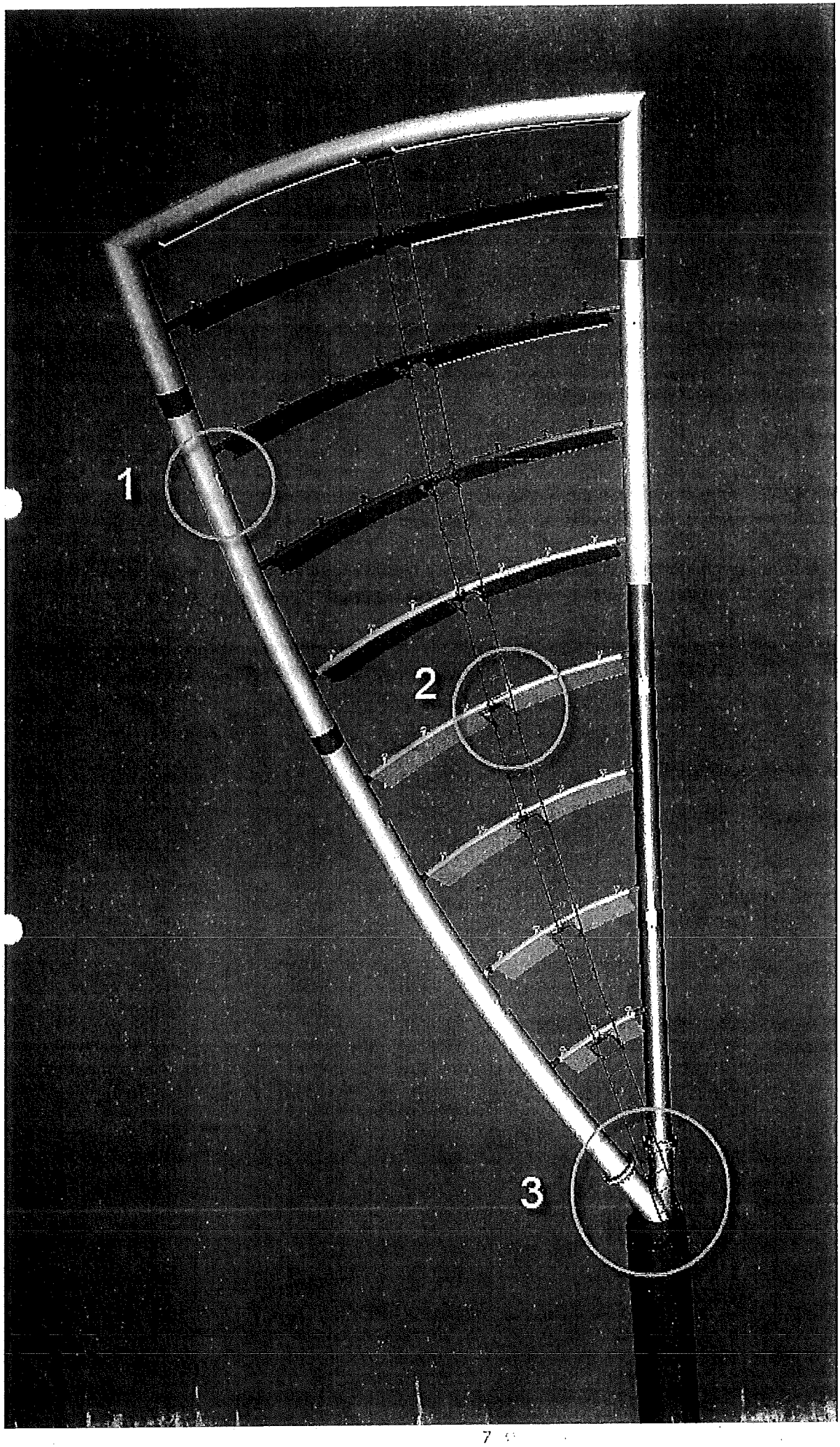
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Ian Smith - Director

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The compressed file is showing some of the circular elements as multi-sided on our computers, and you may experience the same thing. I'll be happy to send any screenshots of the full model if anything is unclear.

Please note there are minor issues unresolved on this model, namely the lower ladder connection and the guide rail for the personnel lift, and the absence of the knuckle joint cladding. Please ignore any anomalies in these areas.

Regards,

For and on behalf of Abacus Lighting Ltd

Lee Dye | Abacus Lighting
Project Engineer

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Nottinghamshire, NG17 5FT, United Kingdom
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Fax: +44 1623 523 286

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Oddicroft Lane, Sutton in Ashfield, Nottinghamshire, UK, NG17 5FT
Company Registration Number: 612235
Telephone: +44 (0)1623 511 111 Fax: +44 (0)1623 552 133
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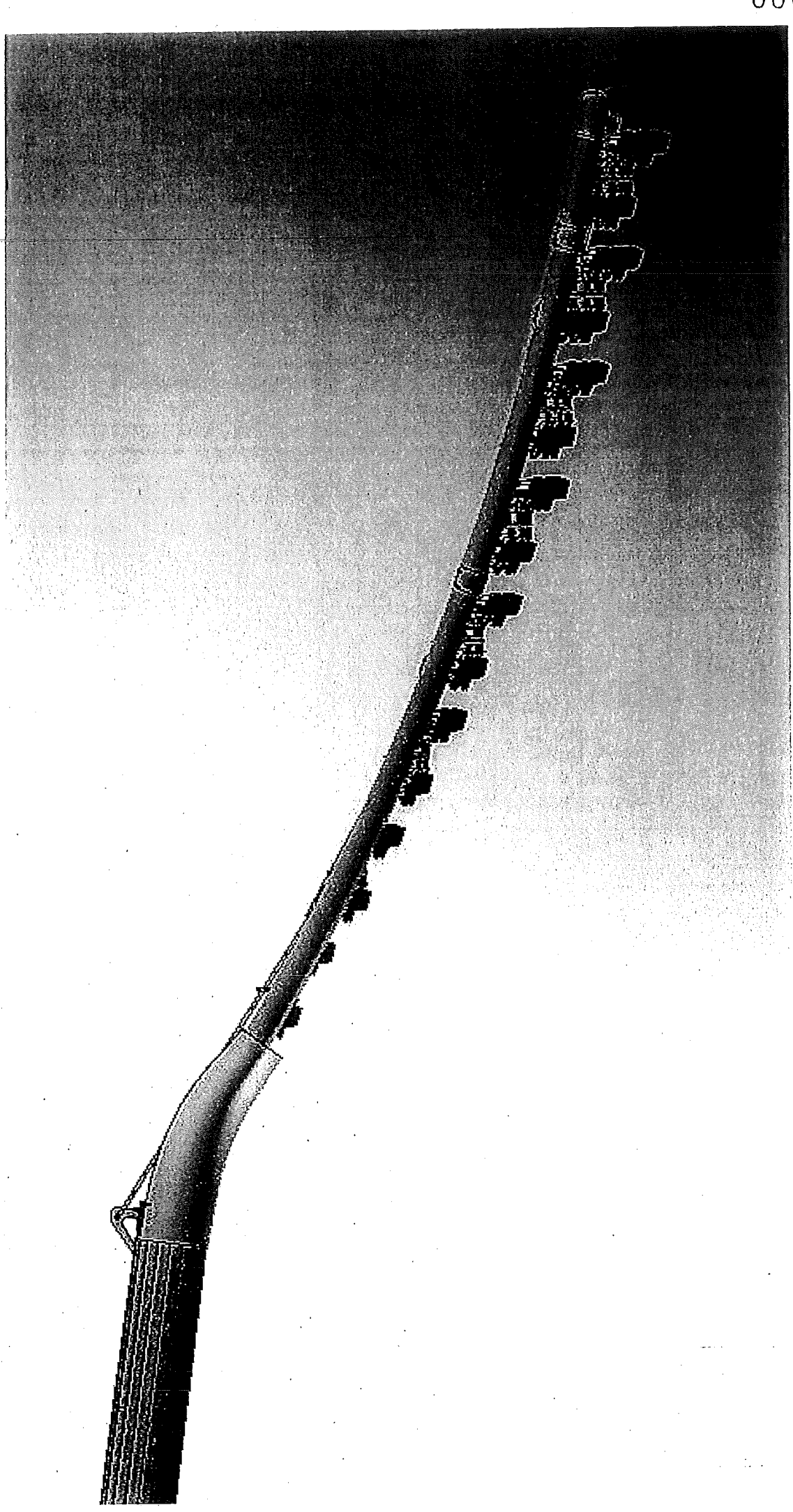

55(a)

Rea, Peter

From: Ian Smith [Ian.Smith@cox.com.au]
Sent: Tuesday, 4 September 2012 7:06 AM
To: Lee Dye
Cc: John Anthony; 'gsutton@dialight.com.au'; Don Gilson; Agnieszka Liso; Maginness, Ron; 'Phillip.Greenup@arup.com.au'; Chris Welbourn; Steve Forster; John Lawson; Dean Hargreaves; Andrew Willetts; Tony Staten; Stuart Harper; Rea, Peter; Gordon Humphreys
Subject: RE: Manuka mast heights (Abacus ref 45508)
Attachments: DC-6075-B063167385.pdf

Hi Lee,

Looks good!. Please press on.

On the lifting bracket, if it really has to be that big, can it's bulk be reduced by forming an open frame as per attached, rather than a solid plate?

Cheers,

IS.

Ian Smith - Director

COX

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From: Lee Dye [mailto:ldye@AbacusLighting.com]
Sent: Tuesday, 4 September 2012 2:33 AM
To: Ian Smith
Cc: John Anthony; 'gsutton@dialight.com.au'; Don Gilson; Agnieszka Liso; 'Ron.Maginness@act.gov.au'; 'Phillip.Greenup@arup.com.au'; Chris Welbourn; Steve Forster; John Lawson; Dean Hargreaves; Andrew Willetts; Tony Staten; Stuart Harper; Rea, Peter; Gordon Humphreys
Subject: RE: Manuka mast heights (Abacus ref 45508)

,n,

Further to the email below, please find attached updated images of the re-shaped cladding as per your requests.

Regards,

For and on behalf of Abacus Lighting Ltd

Lee Dye | Abacus Lighting
Project Engineer

Oddicroft Lane, Sutton-in-Ashfield,
Nottinghamshire, NG17 5FT, United Kingdom
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Visit Abacus at Lux Live 2012 | 6th - 7th November
Stand E15, Earls Court, London

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55(b)

ldye@abacuslighting.com

From: Gordon Humphreys
Sent: 03 September 2012 13:37
To: Ian Smith; Lee Dye
Cc: John Anthony; 'gsutton@dialight.com.au'; Don Gilson; Agnieszka Liso; 'Ron.Maginness@act.gov.au'; 'Phillip.Greenup@arup.com.au'; Chris Welbourn; Steve Forster; John Lawson; Dean Hargreaves; Andrew Willetts; Tony Staten; Stuart Harper; Rea, Peter
Subject: RE: Manuka mast heights (Abacus ref 45508)

Hi Ian,

With reference to your comments below;

1) No problem. We'll pull the front edge of the cladding back a little.

2) We'll bring the cladding in as much as possible in the ladder area but do need to make sure that the access up the ladder isn't obstructed. Note that AS1657 requires at least 200mm clear space behind the ladder.

3) Our proposal has always been to use faceted shafts and this has been shown on all of our drawings. There is no option to use circular sections.

4) The 'ladder' bracket at the base of the headframe is principally a lifting point, hence it's bulk. The point of attachment of the ladder could possibly be pushed in a bit to slightly hide the ladder but the bracket does need to be that size in order to pass the lifting slings through.

And the comments in the fabrications drawings....

IM200/101/6/1; Lifting point. As above (4).

IM200/101/9/1; The ladder attachment brackets need to be able to withstand the vertical load from the climbers and potential fall arrest loads. For this reason the slim attachment brackets you suggest aren't really viable. The attached image is a realistic view from ground level of the headframe – The current ladder brackets really aren't visible in my opinion.

IM200/101/2/1; The lug at the base of the mast is for the anchorage of the lifting slings so is quite necessary. The frame for the door is there to replace the strength in the tube lost from the cut-out. If it were pushed in it would be less effective. It was my understanding that the bases of the masts will be surrounded by enclosures – is this not the case?

IM200/101/8/4; As with the door frame in the base section, this protruding frame is necessary to maintain strength and it becomes ineffective if push inwards. The protrusion is only 15mm and has been orientated on the inside rear of the frames for minimal visual impact.

Regards,

Gordon

For and on behalf of Abacus Lighting Ltd

Gordon Humphreys | Abacus Lighting
Mechanical Design Manager

55(c)

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From: Ian Smith [mailto:Ian.Smith@cox.com.au]
Sent: 03 September 2012 06:35
To: Lee Dye
Cc: John Anthony; 'gsutton@dialight.com.au'; Don Gilson; Agnieszka Liso; 'Ron.Maginness@act.gov.au'; 'Phillip.Greenup@arup.com.au'; Chris Welbourn; Steve Forster; John Lawson; Dean Hargreaves; Andrew Willetts; Tony Staten; Stuart Harper; Gordon Humphreys; Rea, Peter
Subject: RE: Manuka mast heights (Abacus ref 45508)

Hi Lee,

We have reviewed your screen shots. Refer to attached mark-ups. We offer the following comments:

1. Knuckle cladding is looking good. Only request is that the front profile looks to bulge forward a bit too much. Can you pull this back a bit to pick up the profile of the lights more closely as per sketch?

2. Related to this, please look to wrap the cladding as far around as possible to encompass the top of the pole and conceal the ladder as much as possible.

3. Our understanding was that the poles would be tapered circular sections, not faceted, and that to date you had been showing the faceted pole indicatively. However, shop drawings received separately show poles faceted. Please confirm your intent. If faceted, is there any way we can achieve a CHS? Faceted poles will significantly impact the visual style of the whole design.

4. This may fall into the "we haven't designed it yet" category, but it looks as though if you add a bracket to the ladder at the main CHS flange connection point you will be able to subtly change its angle at the base and reduce the associated base bracket size substantially. Please look at this because current brackets are really bulky. If this is not possible the bracket should instead be open frames rather than solid plates.

Hope all this is clear, and happy to discuss. I will look at the shop drawings now, but do not anticipate any additional comments.

Cheers,

IS.

Ian Smith - Director

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55(d)

Hargreaves; Andrew Willetts; Tony Staten; Stuart Harper; Gordon Humphreys
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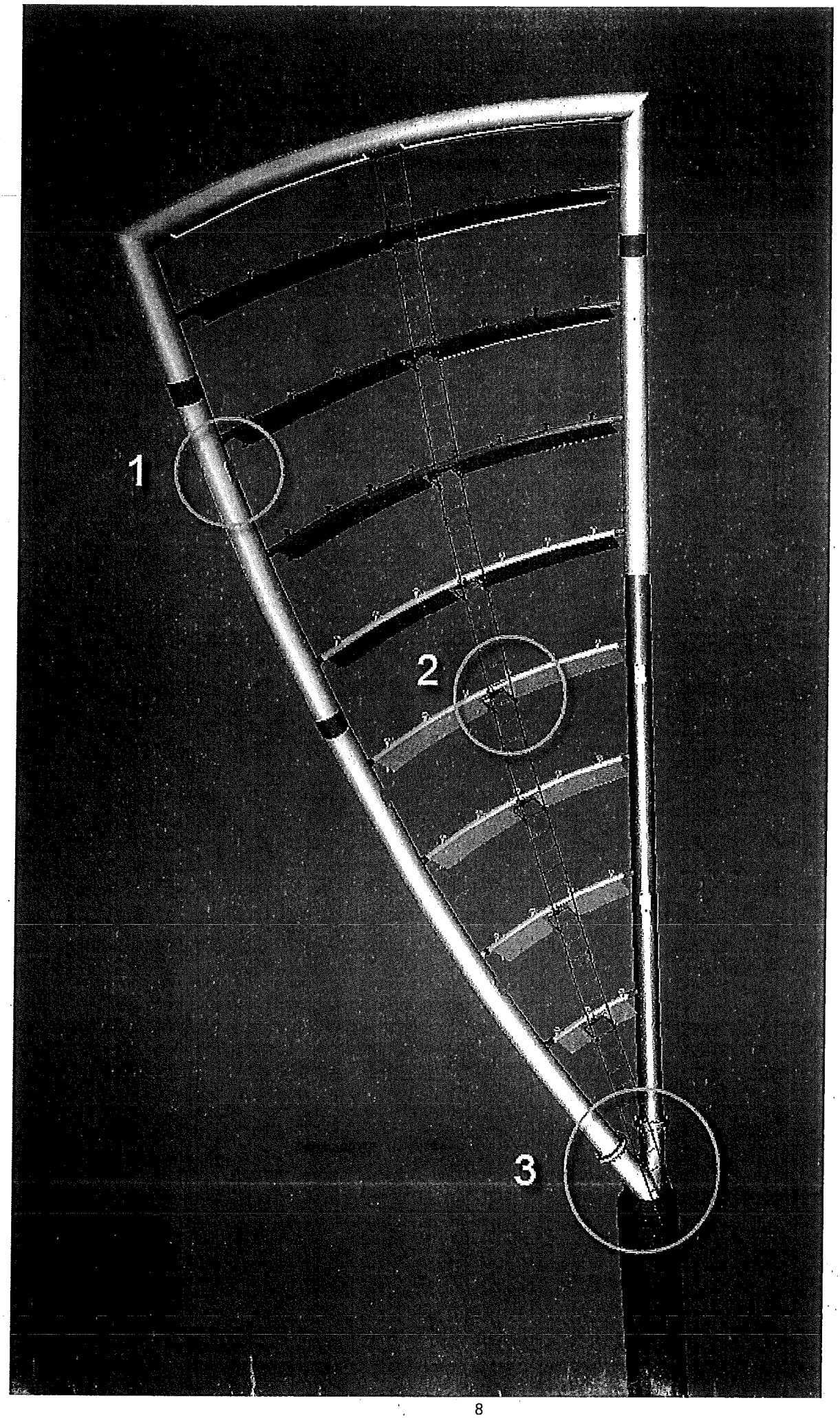
55(h)



Ian Smith - Director

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Project Engineer

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Company Registration Number: 612235
Telephone: +44 (0)1623 511 111 Fax: +44 (0)1623 552 133
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****

Rea, Peter

From: Lee Dye [ldye@AbacusLighting.com]
Sent: Tuesday, 4 September 2012 2:33 AM
To: Ian Smith
Cc: John Anthony; 'gsutton@dialight.com.au'; Don Gilson; Agnieszka Liso; Maginness, Ron; 'Phillip.Greenup@arup.com.au'; Chris Welbourn; Steve Forster; John Lawson; Dean Hargreaves; Andrew Willetts; Tony Staten; Stuart Harper; Rea, Peter; Gordon Humphreys
Subject: RE: Manuka mast heights (Abacus ref 45508)
Attachments: Manuka Cladding2 + Floods ii.JPG; Manuka Cladding3 + Floods ii.JPG; Manuka Cladding4 + Floods ii.JPG

Ian,

Further to the email below, please find attached updated images of the re-shaped cladding as per your requests.

Regards,

For and on behalf of Abacus Lighting Ltd

Lee Dye | Abacus Lighting
Project Engineer

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Nottinghamshire, NG17 5FT, United Kingdom
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Stand E15, Earls Court, London

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ldye@abacuslighting.com

From: Gordon Humphreys
Sent: 03 September 2012 13:37
To: Ian Smith; Lee Dye
Cc: John Anthony; 'gsutton@dialight.com.au'; Don Gilson; Agnieszka Liso; 'Ron.Maginness@act.gov.au'; 'Phillip.Greenup@arup.com.au'; Chris Welbourn; Steve Forster; John Lawson; Dean Hargreaves; Andrew Willetts; Tony Staten; Stuart Harper; Rea, Peter
Subject: RE: Manuka mast heights (Abacus ref 45508)

Hi Ian,

With reference to your comments below;

1) No problem. We'll pull the front edge of the cladding back a little.

2) We'll bring the cladding in as much as possible in the ladder area but do need to make sure that the access up the ladder isn't obstructed. Note that AS1657 requires at least 200mm clear space behind the ladder.

3) Our proposal has always been to use faceted shafts and this has been shown on all of our drawings. There is no option to use circular sections.

4) The 'ladder' bracket at the base of the headframe is principally a lifting point, hence it's bulk. The point of attachment of the ladder could possibly be pushed in a bit to slightly hide the ladder but the bracket does need to be that size in order to pass the lifting slings through.

And the comments in the fabrications drawings....

IM200/101/6/1; Lifting point. As above (4).

IM200/101/9/1; The ladder attachment brackets need to be able to withstand the vertical load from the climbers and potential fall arrest loads. For this reason the slim attachment brackets you suggest aren't really viable. The attached image is a realistic view from ground level of the headframe – The current ladder brackets really aren't visible in my opinion.

IM200/101/2/1; The lug at the base of the mast is for the anchorage of the lifting slings so is quite necessary. The frame for the door is there to replace the strength in the tube lost from the cut-out. If it were pushed in it would be less effective. It was my understanding that the bases of the masts will be surrounded by enclosures – is this not the case?

IM200/101/8/4; As with the door frame in the base section, this protruding frame is necessary to maintain strength and it becomes ineffective if push inwards. The protrusion is only 15mm and has been orientated on the inside rear of the frames for minimal visual impact.

Regards,

Gordon

For and on behalf of Abacus Lighting Ltd

Gordon Humphreys | Abacus Lighting
Mechanical Design Manager

Oddicroft Lane, Sutton-in-Ashfield,
Nottinghamshire, NG17 5FT, United Kingdom
Tel: +44 1623 518 230 | Mob: +44 7973 655 462

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ghumphreys@AbacusLighting.com

From: Ian Smith [mailto:Ian.Smith@cox.com.au]
Sent: 03 September 2012 06:35
To: Lee Dye
Cc: John Anthony; 'gsutton@dialight.com.au'; Don Gilson; Agnieszka Liso; 'Ron.Maginness@act.gov.au'; 'Phillip.Greenup@arup.com.au'; Chris Welbourn; Steve Forster; John Lawson; Dean Hargreaves; Andrew Willetts; Tony Staten; Stuart Harper; Gordon Humphreys; Rea, Peter
Subject: RE: Manuka mast heights (Abacus ref 45508)

Hi Lee,

We have reviewed your screen shots. Refer to attached mark-ups. We offer the following comments:

1. Knuckle cladding is looking good. Only request is that the front profile looks to bulge forward a bit too much. Can you pull this back a bit to pick up the profile of the lights more closely as per sketch?

2. Related to this, please look to wrap the cladding as far around as possible to encompass the top of the pole and conceal the ladder as much as possible.

3. Our understanding was that the poles would be tapered circular sections, not faceted, and that to date you had been showing the faceted pole indicatively. However, shop drawings received separately show poles faceted. Please confirm your intent. If faceted, is there any way we can achieve a CHS? Faceted poles will significantly impact the visual style of the whole design.

4. This may fall into the "we haven't designed it yet" category, but it looks as though if you add a bracket to the ladder at the main CHS flange connection point you will be able to subtly change its angle at the base and reduce the associated base bracket size substantially. Please look at this because current brackets are really bulky. If this is not possible the bracket should instead be open frames rather than solid plates.

Hope all this is clear, and happy to discuss. I will look at the shop drawings now, but do not anticipate any additional comments.

Cheers,

IS.

Ian Smith - Director

COX

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22 Jardine Street, Kingston ACT 2604 Australia
E: Ian.Smith@cox.com.au | T: +61 2 6239 6255 | M: +61 437 037 981 | W: coxarchitecture.com.au | Disclaimer

---

From: Lee Dye [mailto:ldye@AbacusLighting.com]
Sent: Friday, 31 August 2012 11:32 PM
To: Ian Smith
Cc: John Anthony; 'gsutton@dialight.com.au'; Don Gilson; Agnieszka Liso; 'Ron.Maginness@act.gov.au'; 'Rod.Florence@act.gov.au'; 'Phillip.Greenup@arup.com.au'; Chris Welbourn; Steve Forster; John Lawson; Dean Hargreaves; Andrew Willetts; Tony Staten; Stuart Harper; Gordon Humphreys
Subject: RE: Manuka mast heights (Abacus ref 45508)

'ɪn,

Please find attached same views including floodlights.

Regards,

For and on behalf of Abacus Lighting Ltd

Lee Dye | Abacus Lighting
Project Engineer

Oddicroft Lane, Sutton-in-Ashfield,
Nottinghamshire, NG17 5FT, United Kingdom
Tel: +44 1623 518 286
Fax: +44 1623 523 286

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ldye@abacuslighting.com

From: Ian Smith [mailto:Ian.Smith@cox.com.au]
Sent: 31 August 2012 13:13
To: Lee Dye
Cc: Gordon Humphreys
Subject: Re: Manuka mast heights (Abacus ref 45508)

Hi Lee,

Can you send same views with spot lights on frame?

Thanks,

IS.

From: Lee Dye
Sent: 31 August 2012 09:10
To: 'Ian Smith'
Cc: John Anthony; 'gsutton@dialight.com.au'; Don Gilson; Agnieszka Liso; 'Ron.Maginness@act.gov.au'; 'Rod.Florence@act.gov.au'; 'Phillip.Greenup@arup.com.au'; Chris Welbourn; Steve Forster; John Lawson; Dean Hargreaves; Andrew Willetts; Tony Staten; Stuart Harper; Gordon Humphreys
Subject: RE: Manuka mast heights (Abacus ref 45508)

Ian,

Thanks for your comments. Please find attached screenshots of the proposed cladding shape for your approval/comments (thought it would be quicker than sending the model, but can be arranged if necessary). If you're happy with the shape we are proposing, I can go ahead and issue manufacturing details. We have hopefully achieved the more tangential shape you were requesting.

Regards,

For and on behalf of Abacus Lighting Ltd

Lee Dye | Abacus Lighting
Project Engineer

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Fax: +44 1623 523 286

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ldye@abacuslighting.com

From: Ian Smith [mailto:Ian.Smith@cox.com.au]
Sent: 30 August 2012 09:24
To: Gordon Humphreys; Lee Dye
Cc: John Anthony; 'gsutton@dialight.com.au'; Don Gilson; Agnieszka Liso; 'Ron.Maginness@act.gov.au'; 'Rod.Florence@act.gov.au'; 'Phillip.Greenup@arup.com.au'; Chris Welbourn; Steve Forster; John Lawson; Dean Hargreaves; Andrew Willetts; Tony Staten; Stuart Harper
Subject: RE: Manuka mast heights (Abacus ref 45508)

Hi Gordon,

Thanks for getting back to me so quickly. All makes sense. Hope the shop drawing and fabrication is coming along well and is on track. Please send a model of the knuckle cladding when you have it prepared.

Ron is packing his bag in readiness for a visit (aka junket) to check out your handiwork in person – I think he plans to be there in a two to three weeks. What's he likely to see?

I'll be keen to hear what the consistency of the galvanised finish is like because we are still discussing the pros and cons of post finishing the towers at this end. The decision will depend in part on the regularity of the gal finish.

Cheers,

IS.

Ian Smith - Director

COX

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---

From: Gordon Humphreys [mailto:ghumphreys@AbacusLighting.com]
Sent: Thursday, 30 August 2012 6:14 PM
To: Ian Smith; Lee Dye
Cc: John Anthony; 'gsutton@dialight.com.au'; Don Gilson; Agnieszka Liso; 'Ron.Maginness@act.gov.au'; 'Rod.Florence@act.gov.au'; 'Phillip.Greenup@arup.com.au'; Chris Welbourn; Steve Forster; John Lawson; Dean Hargreaves; Andrew Willetts; Tony Staten; Stuart Harper
Subject: RE: Manuka mast heights (Abacus ref 45508)

Hi Ian,

Thanks for the feedback. I'm actually quite impressed you managed to open the model given the problems we had in creating it!

The access panels on the rear of the headframe are for cabling. We have tried to make them as small and nobtrusive as possible but we do need to weld in a stiffener 'frame' to restore the strength of the tube where the cut-out is, so a flush door isn't really viable. The protrusion is only 15mm and since it is on the rear of the tube and angled inwards I think you'd struggle to see it from ground level.

AS1657 doesn't seem to specifically preclude cantilever rung style ladders although all the references are to ladders with stiles as per our current design. Our principal reason for proposing this type of ladder is that it is easier to climb and step sideways off a ladder with stiles and also, in the event of a fall, it is preferable not to have bare ended rungs.

With regards to the knuckle area; we have been careful to ensure the slightly reposition flanges will not obstruct the line of the cladding. By using straight sections of tube below the flange it greatly simplifies the fabrication process.

Regards,

Gordon

For and on behalf of Abacus Lighting Ltd

Gordon Humphreys | Abacus Lighting
Mechanical Design Manager

Oddicroft Lane, Sutton-in-Ashfield,
Nottinghamshire, NG17 5FT, United Kingdom
Tel: +44 1623 518 230 | Mob: +44 7973 655 462

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ghumphreys@AbacusLighting.com

From: Ian Smith [mailto:Ian.Smith@cox.com.au]
Sent: 30 August 2012 02:14
To: Lee Dye
Cc: John Anthony; 'gsutton@dialight.com.au'; Don Gilson; Agnieszka Liso; 'Ron.Maginness@act.gov.au'; 'Rod.Florence@act.gov.au'; 'Phillip.Greenup@arup.com.au'; Chris Welbourn; Gordon Humphreys; Steve Forster; John Lawson; Dean Hargreaves; Andrew Willetts; Tony Staten; Stuart Harper
Subject: RE: Manuka mast heights (Abacus ref 45508)

Hi Lee,

Stu and I have reviewed. Is coming together really well – is a credit to your team. Excluding the items you noted below (the lower ladder connection, guide rail for the personnel lift, and the absence of the knuckle joint cladding) we'd have the following brief comments, noting none of them are major and we are only tabling comments if there is scope and value in adjusting without delaying you:

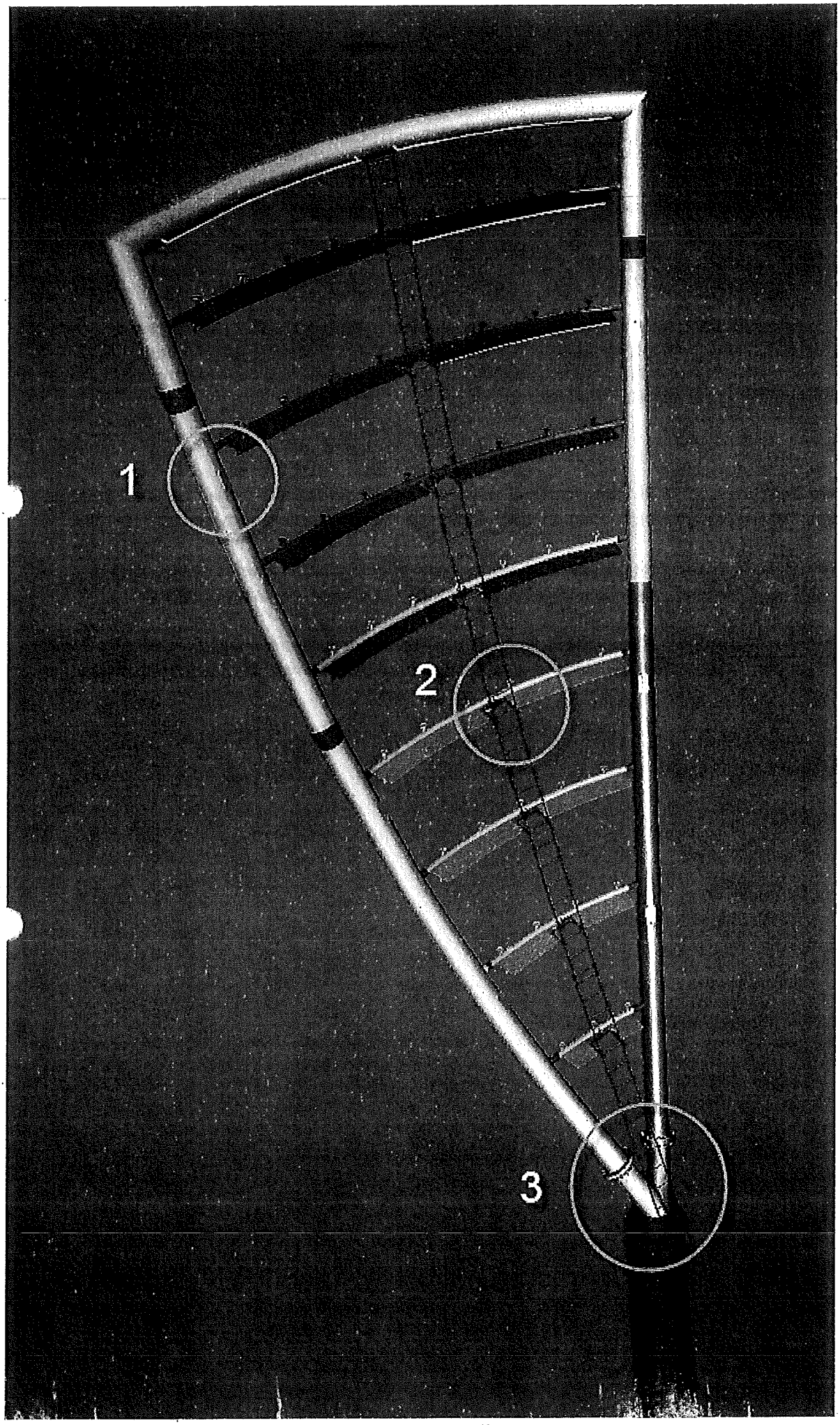
1. You are indicating some oval shaped access panels on the rear of the main head frame CHS which we presume provide access to cabling. Can the cover plates for these be curved to match the CHS profile so the cover plates are therefore fully flush with the CHS at all edges?

2. Previous versions showed the ladder as a central rail with cantilevered upturned rungs. Any reason why you have shifted to a double rail ladder? Is it local access codes? Previous was more slender, but what you are showing is also okay;

3. Base of head frame previously had bent CHS sections so the flange was horizontal and fixed to the top plate of the pole. In reconfiguring the arrangement can you please make sure that connection flanges do not encroach on the zone of the knuckle cladding and prevent it from achieving the intent of forming tangential forms between the pole and head frame in front and side elevation as per the attached email.

Thanks, and all the best.

IS.


1
2
3

Ian Smith - Director

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From: Lee Dye [mailto:ldye@AbacusLighting.com]
Sent: Wednesday, 29 August 2012 6:07 PM
To: Ian Smith
Cc: John Anthony; 'gsutton@dialight.com.au'; Don Gilson; 'david.sloan@landdata.com.au'; Agnieszka Liso; 'Ron.Maginness@act.gov.au'; 'Rod.Florence@act.gov.au'; 'Phillip.Greenup@arup.com.au'; Chris Welbourn; Gordon Humphreys; Steve Forster; John Lawson; Dean Hargreaves; Andrew Willetts; Don Gilson; Tony Staten; Stuart Harper
Subject: RE: Manuka mast heights (Abacus ref 45508)

Ian,

I have uploaded a WinRAR compression file containing the .iges file of the mast assembly to the DropBox. Please let me know if you encounter any issues trying to open the file, which is still quite large post-compression (188MB).

The compressed file is showing some of the circular elements as multi-sided on our computers, and you may experience the same thing. I'll be happy to send any screenshots of the full model if anything is unclear.

Please note there are minor issues unresolved on this model, namely the lower ladder connection and the guide rail for the personnel lift, and the absence of the knuckle joint cladding. Please ignore any anomalies in these areas.

Regards,

For and on behalf of Abacus Lighting Ltd

Lee Dye | Abacus Lighting
Project Engineer

Oddicroft Lane, Sutton-in-Ashfield,
Nottinghamshire, NG17 5FT, United Kingdom
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Fax: +44 1623 523 286

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****
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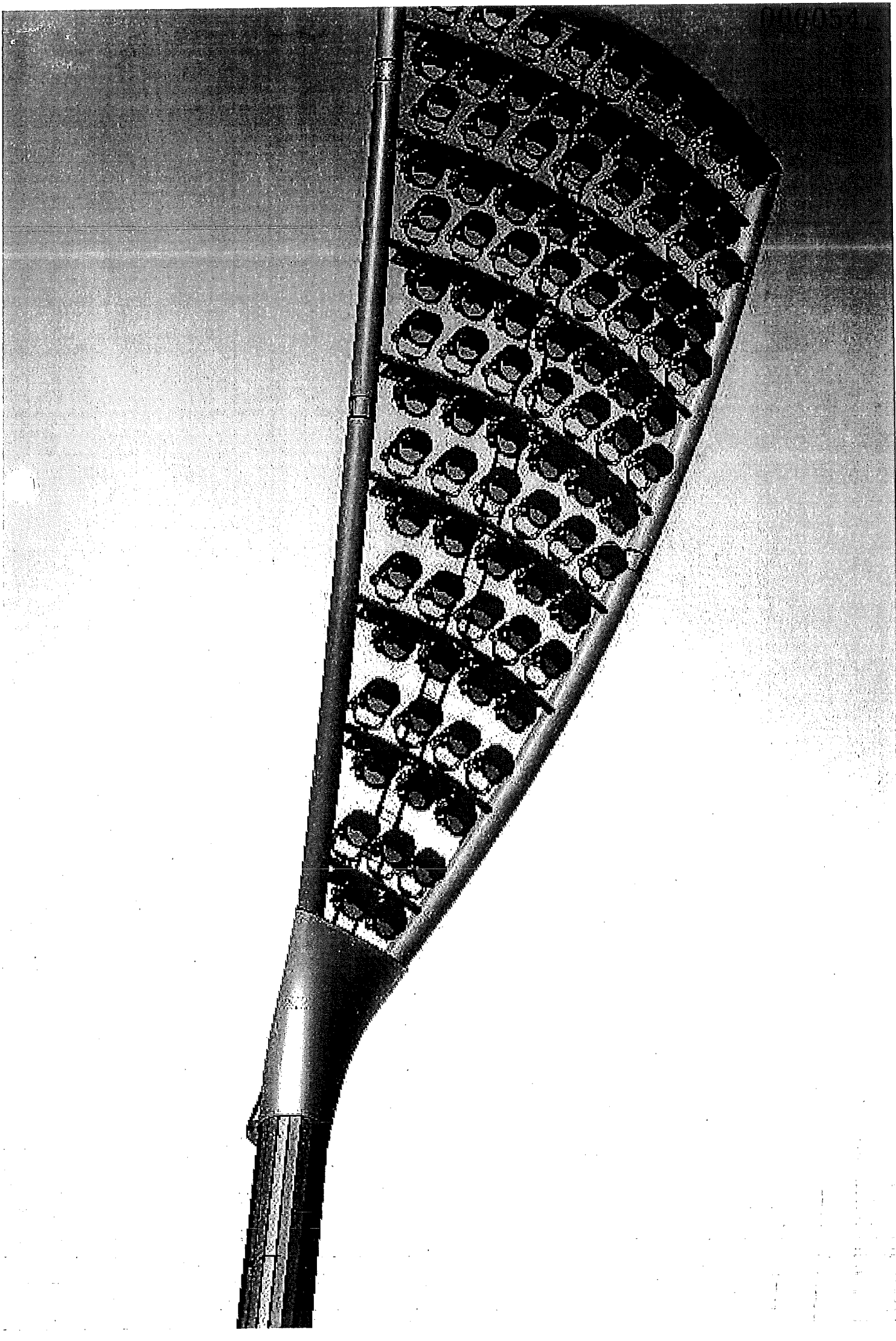

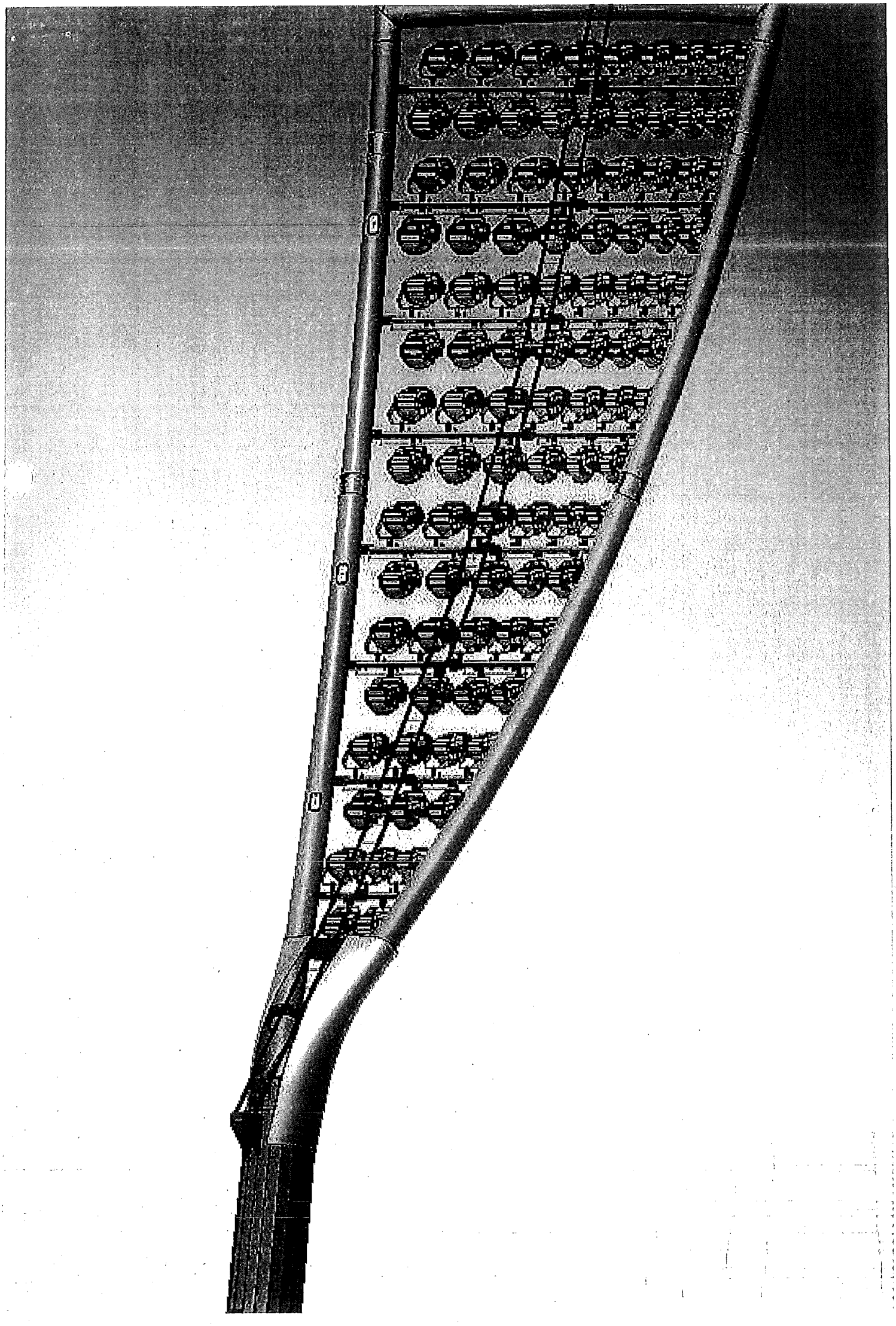

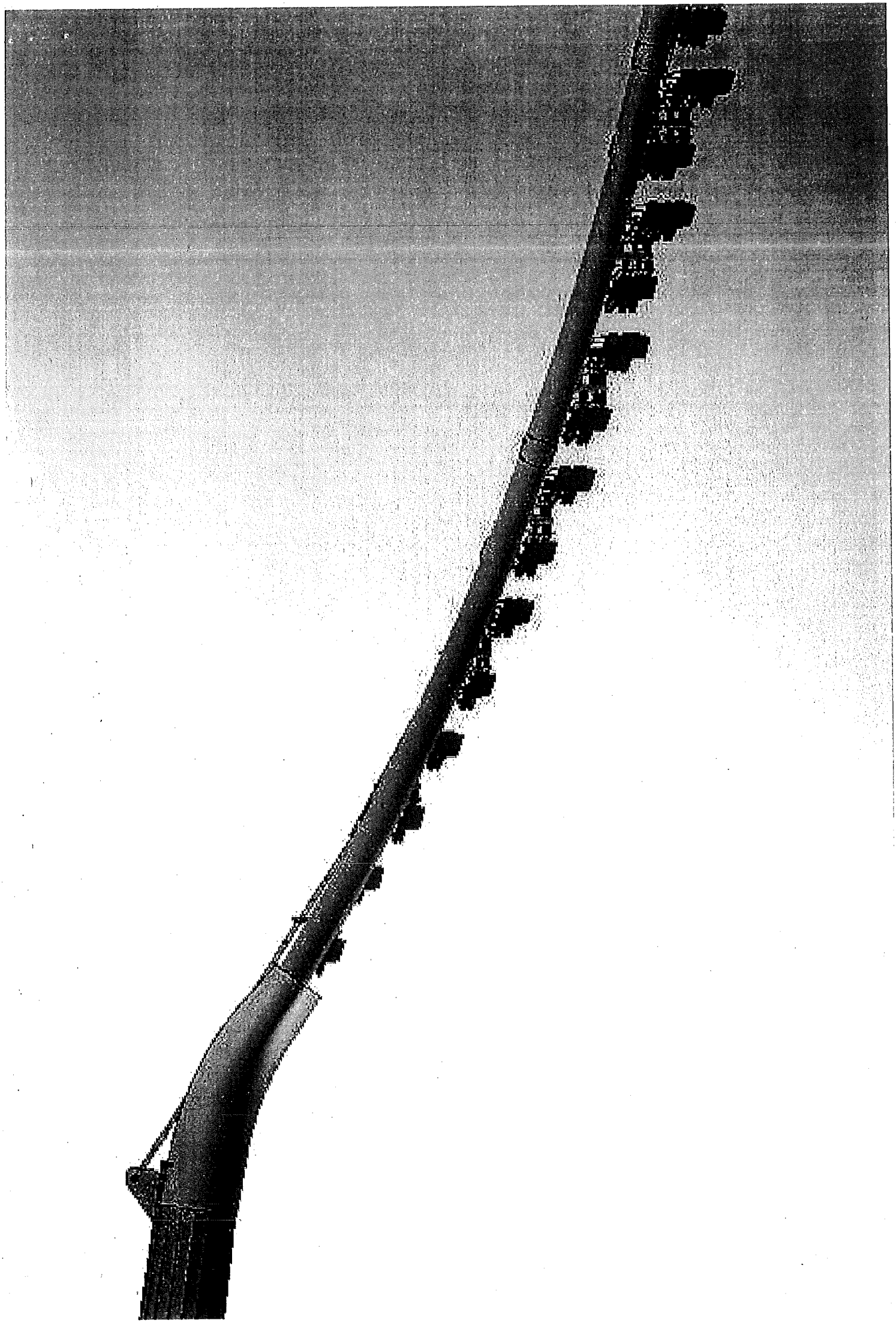

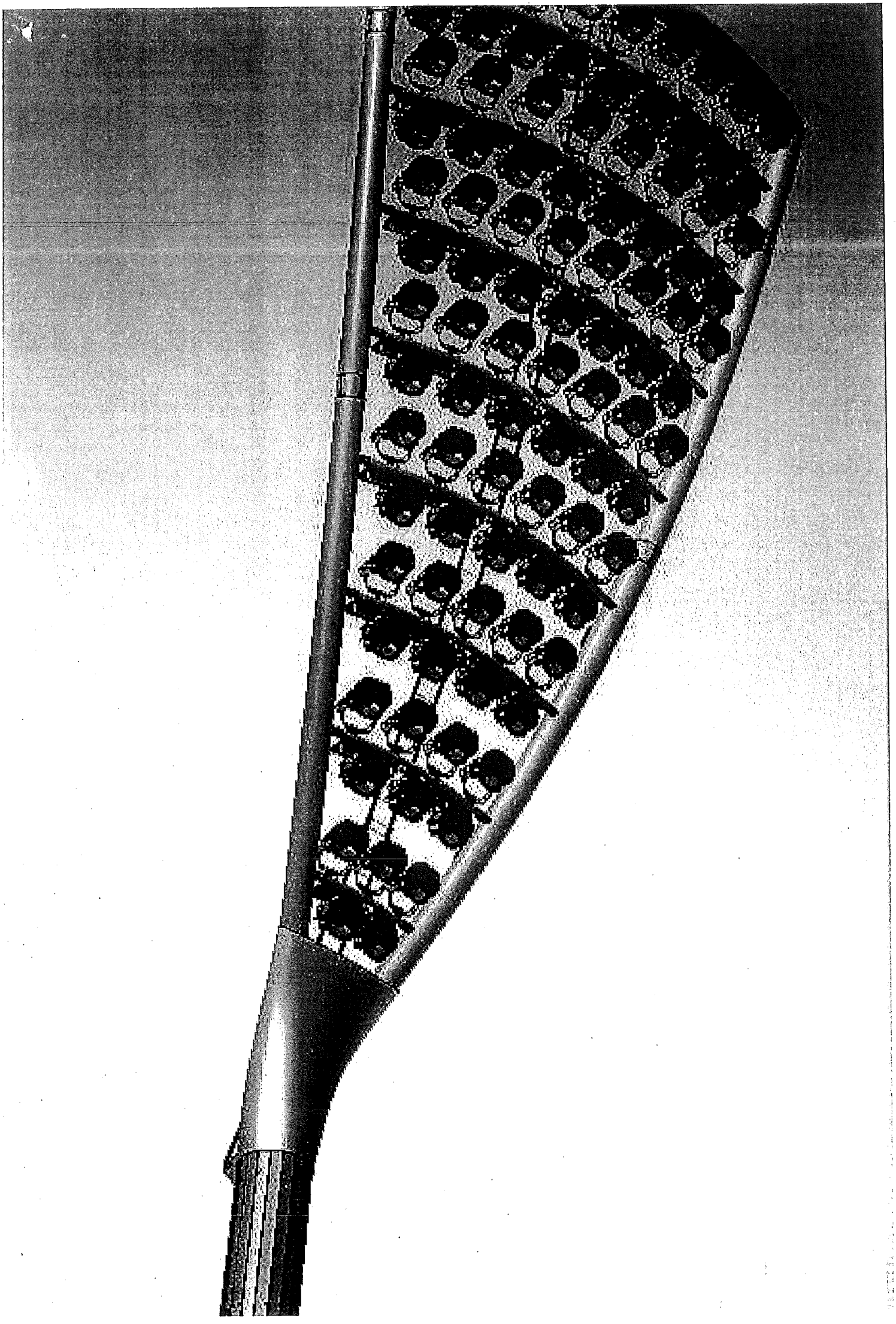

Rea, Peter

From: Ian Smith [Ian.Smith@cox.com.au]
Sent: Monday, 3 September 2012 4:22 PM
To: Tony Staten
Cc: 'gsutton@dialight.com.au'; Don Gilson; Lee Dye; Dean Hargreaves; John Anthony; Gordon Humphreys; Maginness, Ron; Rea, Peter; Agnieszka Liso; Stuart Harper; Florence, Rod
Subject: RE: SAP 45508 - Manuka Oval
Attachments: DC-6075-B063167383.pdf; DC-6075-B063167384.pdf

Hi Tony,

See attached our comments on the two sets of shop drawings issued Saturday am our time. Note I have not checked setout or dimensions. All comments relate to design intent only. These are to be read in conjunction with comments on Lee's screen shots I sent an hour ago which cover our main concerns. Any queries I'm happy to discuss,

Regards,

IS.

Ian Smith - Director

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From: Tony Staten [mailto:AStaten@AbacusLighting.com]
Sent: Saturday, 1 September 2012 1:56 AM
To: Ian Smith
Cc: 'gsutton@dialight.com.au'; Don Gilson; Lee Dye; Dean Hargreaves; John Anthony; Gordon Humphreys
Subject: FW: SAP 45508 - Manuka Oval

Hi Ian,

Please find attached the headframe manufacturing drawings.

. ease pass to whoever needs them.

Best regards

For and on behalf of Abacus Lighting Ltd

Tony Staten | Abacus Lighting
Global Contracts Director

Oddicroft Lane, Sutton-in-Ashfield,
Nottinghamshire, NG17 5FT, United Kingdom
Tel: +44 1623 518 226 | Mob: +44 7973 908 510

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AStaten@AbacusLighting.com

From: Lee Dye
Sent: 31 August 2012 16:31

To: Tony Staten
Cc: Gordon Humphreys
Subject: SAP 45508 - Manuka Oval

Headframe drawings.

For and on behalf of Abacus Lighting Ltd

Lee Dye | Abacus Lighting
Project Engineer

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Nottinghamshire, NG17 5FT, United Kingdom
Tel: +44 1623 518 286
Fax: +44 1623 523 286

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ldye@abacuslighting.com

****
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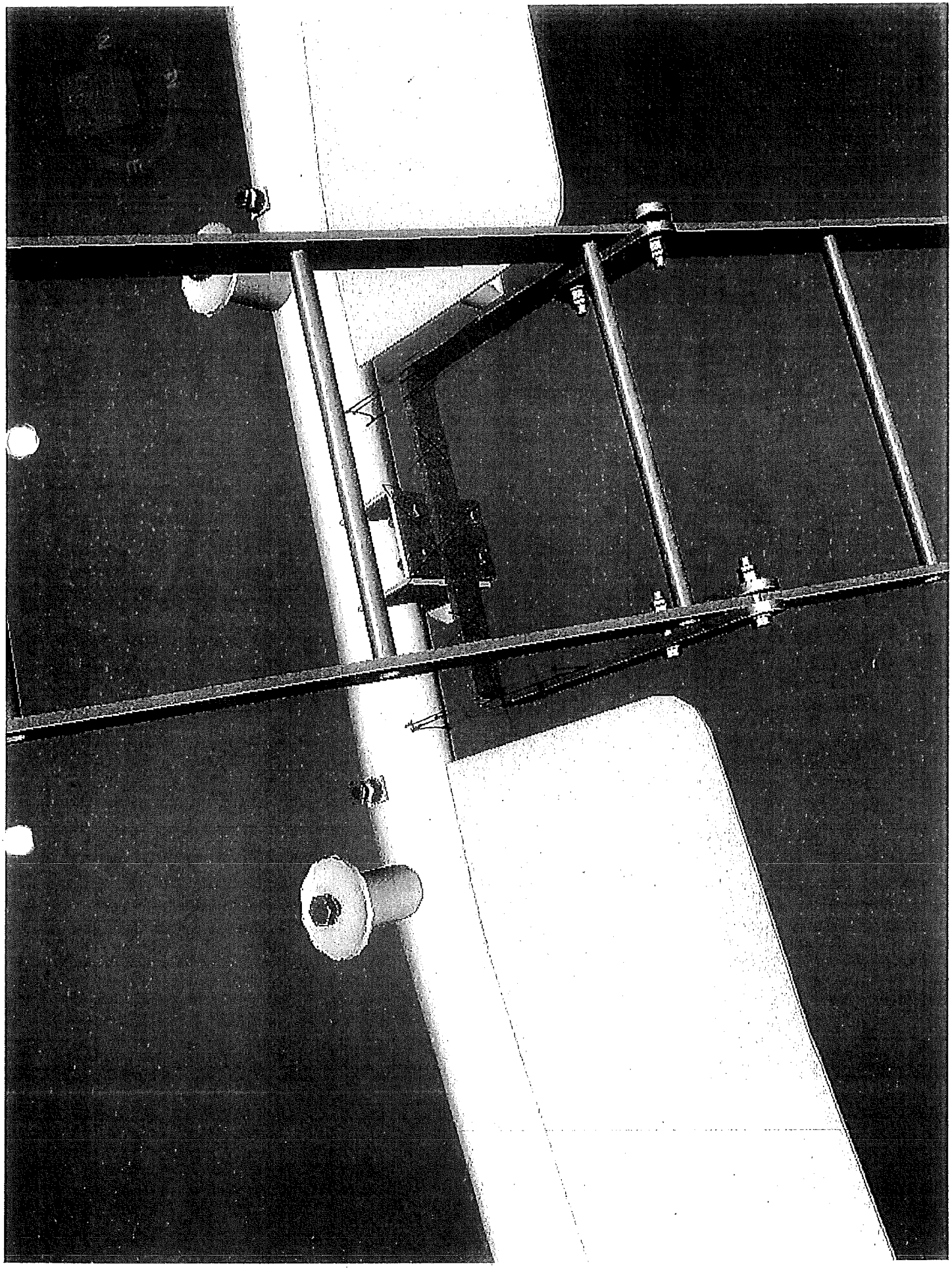
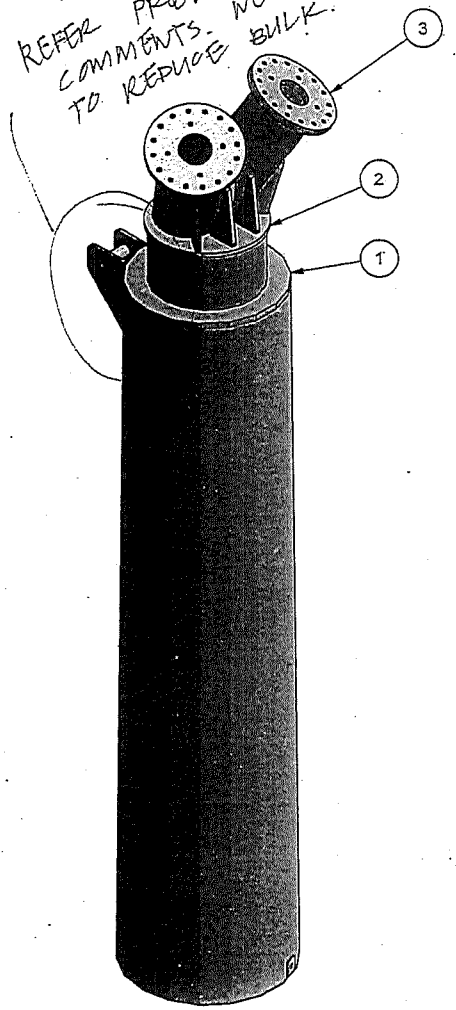
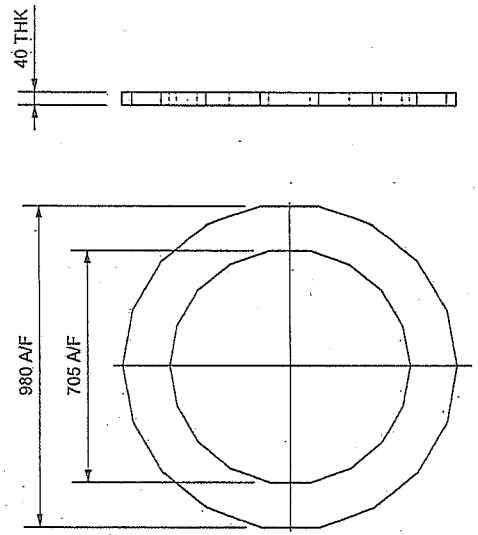
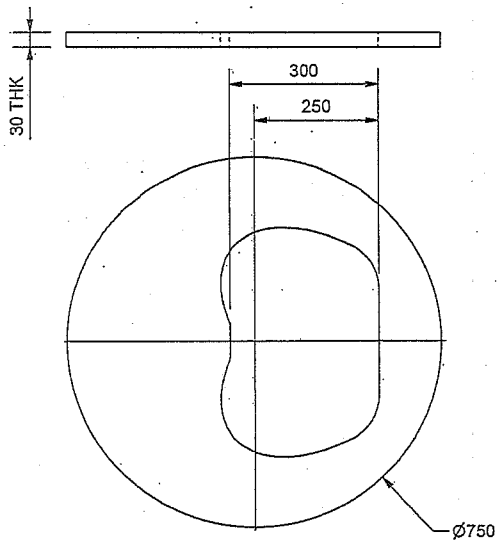


REFER PREVIOUS COMMENTS. WE NEED TO REDUCE BULK.





ITEM No. CAP980AF40/705AF

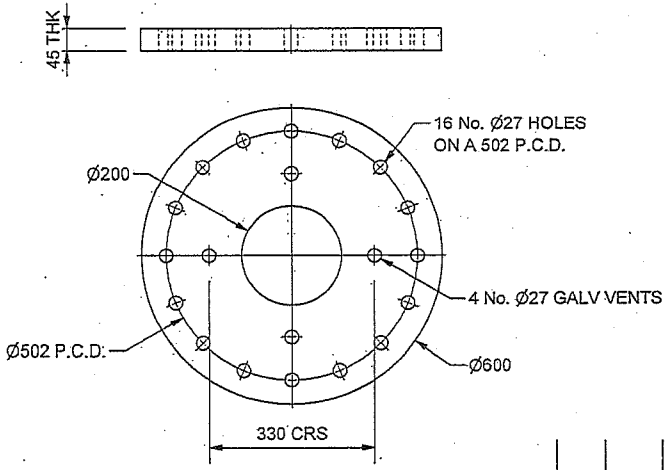


ITEM No. CAP75030/1
REFER TO CAD TEMPLATE PROVIDED FOR CUTOUT DIMS

NOTES:

1. FIRST ANGLE PROJECTION.
2. DIMENSIONS SHOWN IN BRACKETS THUS (25) ARE REF. DIMENSIONS ONLY.
3. REMOVE ALL BURRS & SHARP EDGES.
4. DO NOT SCALE IF IN DOUBT ASK.
5. ALL STANDARDS & SPECIFICATIONS ARE TO BE TO THE LATEST REVISIONS.
6. MATERIAL: PLATE FROM M.STO BSEN 10025 GRD S355. PLATE 25mm THICK AND OVER TO BE CHARPY TEST VALUE OF 27J (MIN) AT -20°C.
7. FINISH: SELF COLOUR.

PLATE ULTRA SONIC TESTED TO BS EN 10160 GRD. S1 TO ENSURE LAMINATIONS (INCLUSIONS) ARE NOT PRESENT. GRADE S355.



ITEM No. FP45/27/0.6/1

Parts List			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	CAP980AF40/705AF	980A/F X 40THK 705 A/F HOLE
2	1	CAP75030/1	30THK CAP PLATE 750dia SHAPED
3	2	FP45/27/0.6/1	45 THK F/PLT 600DIA 16HLS 27 DIA 502PCD

REV	SIG	DESCRIPTION	DATE	CHD

ISO9001 • ISO14001 OHSAS 18001

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Patent No.
Reg. Design No.

General tolerences unless stated otherwise:-
0mm-500mm ± 1
501mm-1000mm ± 2
Above ± 2

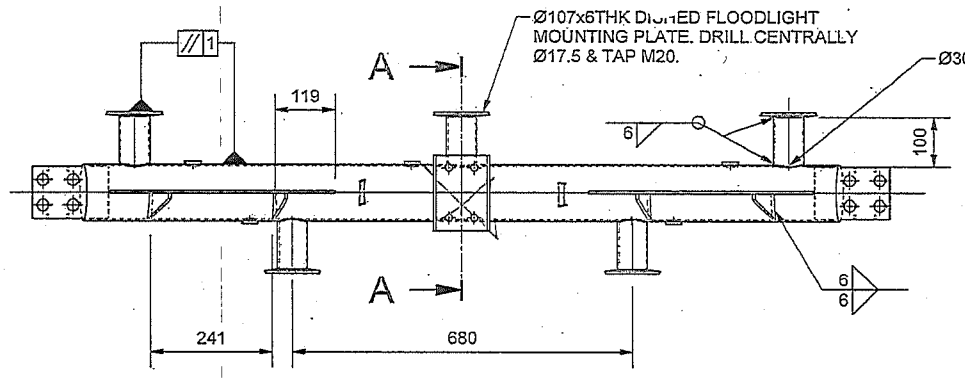
Drawn L. DYE
Checked A. BOOTH
Not to scale
Date 22/08/2012

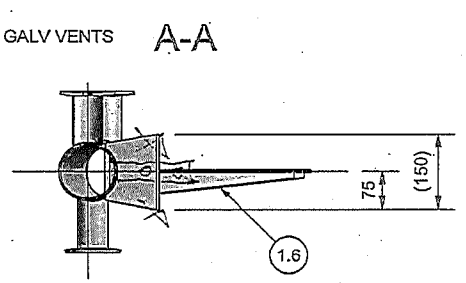
Title: FLANGE PLATE DETAILS FOR TOP SHAFT OF INCLINE MAST.

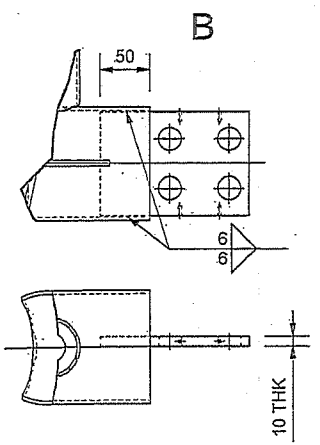
Abacus World Leaders in Lighting

Client I.L.S.
Sales order No. 45508
Drg. No. IM200/101/6/1

250052

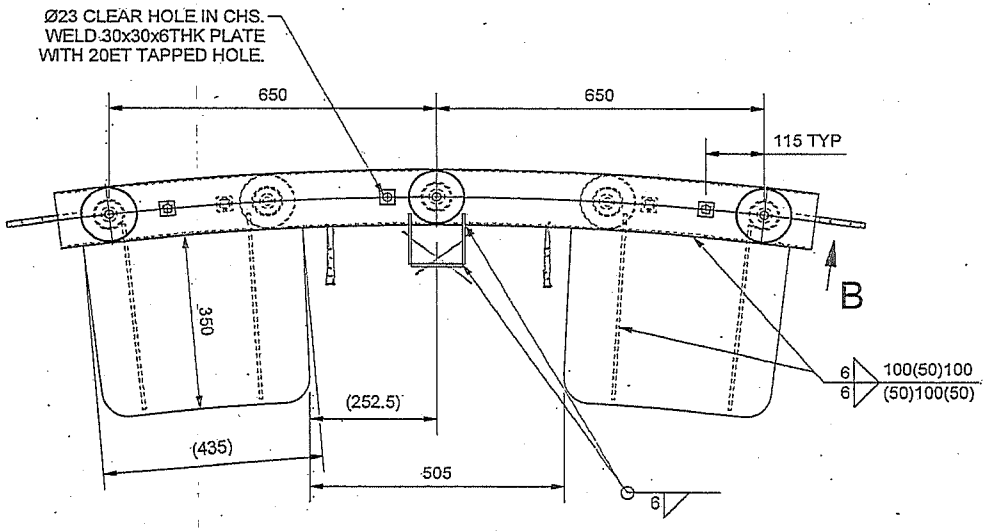


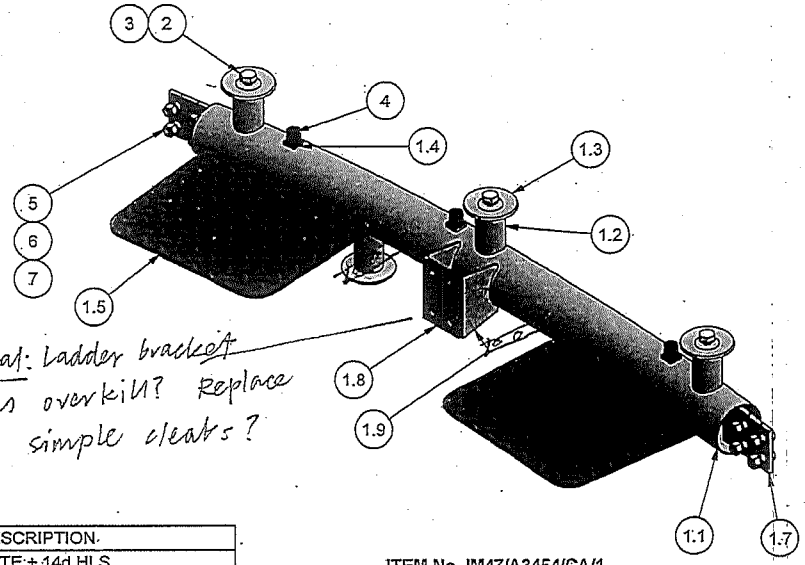




NOTES

1. FIRST ANGLE PROJECTION.
2. DIMENSIONS SHOWN IN BRACKETS THUS (25) ARE REF. DIMENSIONS ONLY.
3. REMOVE ALL BURRS & SHARP EDGES.
4. DO NOT SCALE IF IN DOUBT ASK.
5. WELDING SYMBOLS ARE TO BS EN ISO 4063 & BS EN 22553
6. ALL STANDARDS & SPECIFICATIONS ARE TO BE TO THE LATEST REVISIONS.
7. FILLET WELDS TO BE TO WELD PROCEDURE No. 031 WL.
8. MATERIAL: CHS TO BE EN 10210 GRD S355 WITH A TENSILE STRENGTH OF 490 N/mm². PLATE FROM MS TO BSEN 10025 GRD S355.
9. FINISH: HOT DIP GALV TO BS EN ISO 1461.
10. FOR FURTHER DETAILS OF COMPONENTS, SEE DRG No. IM200/101 ~~B/F~~ RANGE.





Typical: Ladder bracket seems overkill? Replace with simple cleats?

ITEM	QTY	PART NUMBER	DESCRIPTION	ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	IM47/A3454/CA/1/A	CROSS ARM No.1 ASSY	1.8	1	IM47/A3454/CA/LD1	150x100x6THK PLATE + 14d HLS
1.1	1	IM47/A3454/CA/1/P	114DIAx3.6 CHS ROLLED CROSS ARM R5710	1.9	2	IM47/A3454/CA/LD2	150x100x6THK SHAPED PLATE
1.2	5	SP60100/114	60 X 3.0THK CHS SHAPED TO SUIT 114dia	2	5	SS107F/8.8	M20 X 50 GALV SETSCREW GRADE 8.8
1.3	5	CAP1076/17.5D	107DIA X 6THK 17.5DIA PUNCHED HOLE DISH	3	5	WA038F	M20 SHAKEPROOF WASHER GALV EXT
1.4	5	FB30X6/30/4	30X6 FLAT BAR 30 LG CENTRAL HOLE 18.5D	4	5	ELF133	ELKAY 252B CABLE GLAND 20MM, BLACK
1.5	2	IM47/A3454/CA/1PL	6THK DURBAR STEP FOR CROSS ARM No.1	5	8	SS085F	M16 X 45 SETSCREW GALV
1.6	4	IM47/A3454/CA/GUS	375x50x6 THK GUSSET SHAPED	6	16	WA030F	M16 WASHER GALVANISED
1.7	2	IM47/A3454/CA/SP	150x105x10 THK SPLICE PLT + HLS	7	8	NUT092F	M16 HEX NUT GALV

ITEM No. IM47/A3454/CA/1
WEIGHT: 40kg

REV	SIG	DESCRIPTION	DATE	CHD

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ISO9001 • ISO14001 OHSAS 18001

Patent No.
Reg. Design No.

General tolerences unless stated otherwise:-

0mm-500mm ——— ± 1
501mm-1000mm — ± 2
Above ——— ± 3

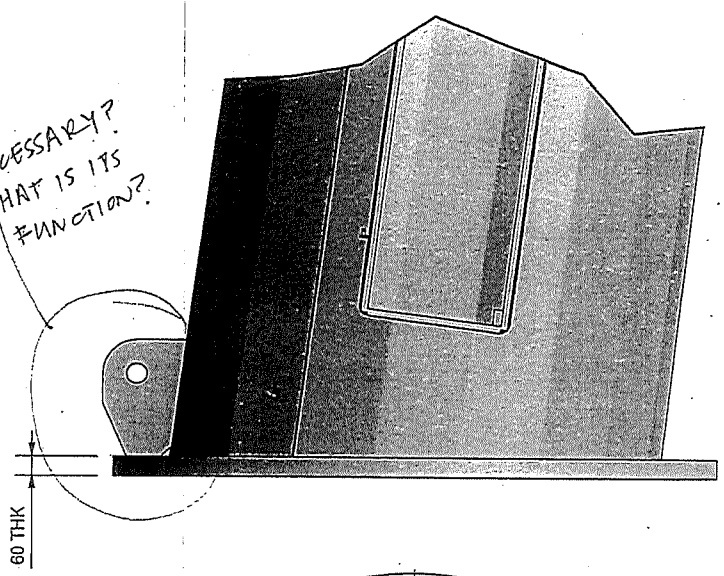
Drawn L. DYE
Checked A. BOOTH
Not to scale
Date 28/08/2012

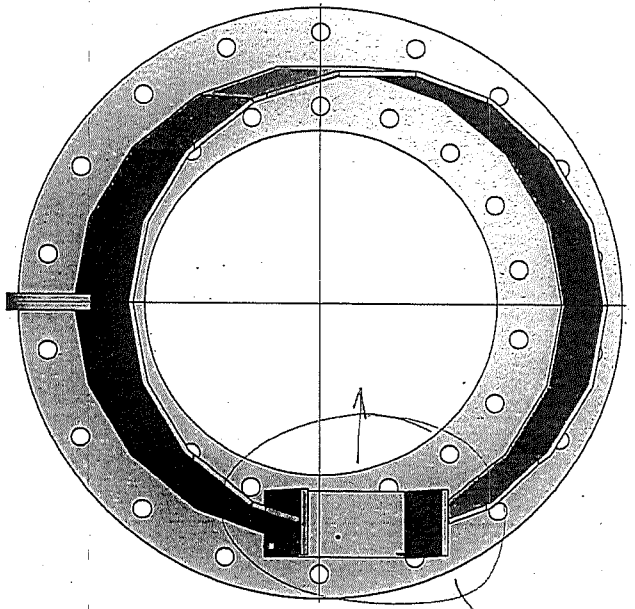
Title: DETAIL OF CROSS ARM No.1 FOR HEADFRAME ASSEMBLY.

Abacus
World Leaders in Lighting

Client I.L.S.
Sales order No. 45508
Drg. No. IM200/101/9/1

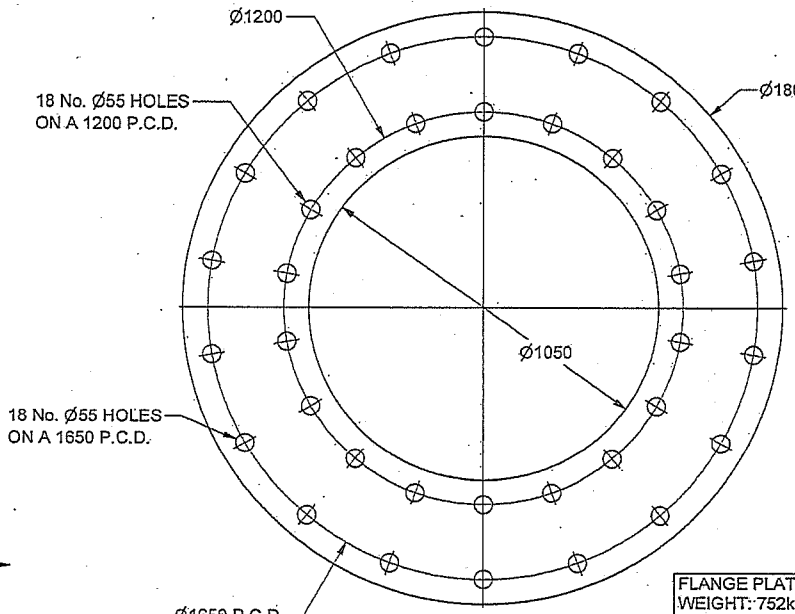
NECESSARY? WHAT IS ITS FUNCTION?





DIRECTION OF FLOODS

PUSH IN. SO FACE PROTRUDES BEYOND POLE LESS?



NOTES

1. FIRST ANGLE PROJECTION.
2. DIMENSIONS SHOWN IN BRACKETS THUS (25) ARE REF. DIMENSIONS ONLY.
3. REMOVE ALL BURRS & SHARP EDGES.
4. DO NOT SCALE IF IN DOUBT ASK.
5. ALL STANDARDS & SPECIFICATIONS ARE TO BE TO THE LATEST REVISIONS.
6. MATERIAL: PLATE FROM M.STO BSEN 10025 GRD S355. PLATE 25mm THICK AND OVER TO BE CHARPY TEST VALUE OF 27J (MIN) AT -20°C.

FLANGE PLATE ITEM No. FP60/55/1.8/1
WEIGHT: 752kg
PLATE ULTRA SONIC TESTED TO BS EN 10160 GRD.S1 TO ENSURE LAMINATIONS (INCLUSIONS) ARE NOT PRESENT. GRADE S355.

REV	SIG	DESCRIPTION	DATE	CHD
A	L.D.	BOLT REF REMOVED.	13/8/12	A.B.

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Patent No.
Reg. Design No:

General tolerences unless stated otherwise:-

0mm-500mm——± 1
501mm-1000mm—± 2
Above————± 2

Drawn L. DYE
Checked G. HUMPHREYS
Not to scale
Date 09/08/2012

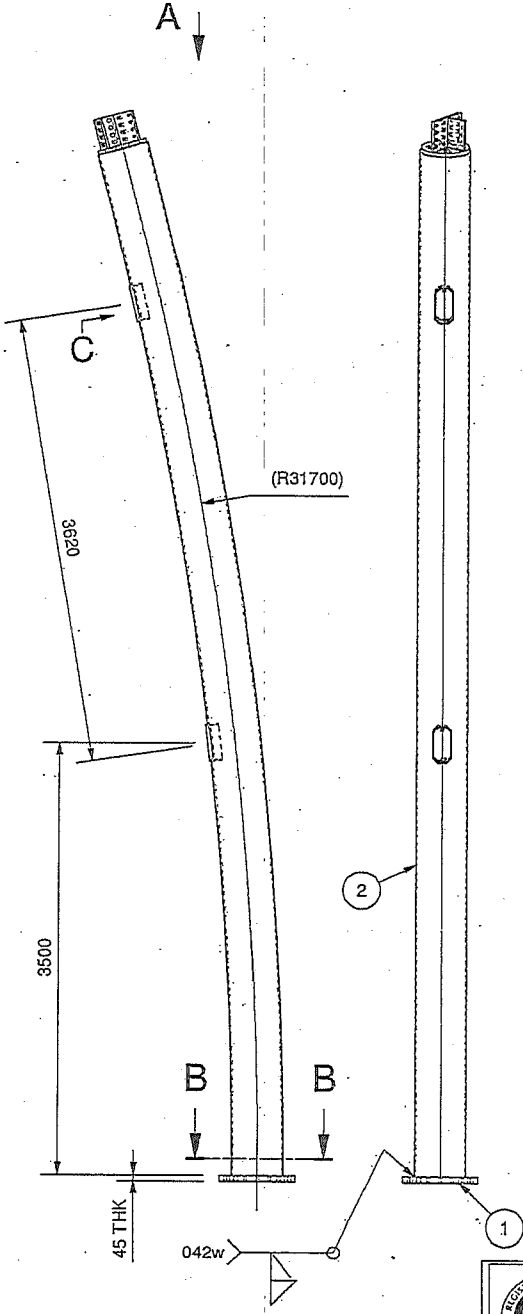
Title: DETAIL OF FLANGE PLATE FOR 47m INCLINE MAST.

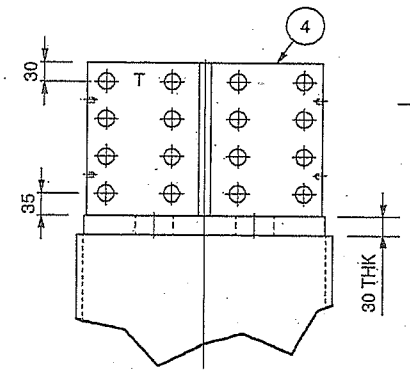
Abacus World Leaders in Lighting

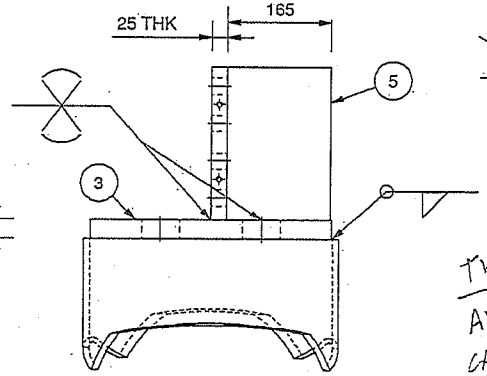
Client I.L.S.

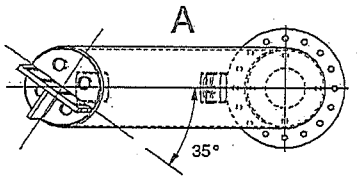
Sales order No. 45508

Drg. No. IM200/101/2/1 A



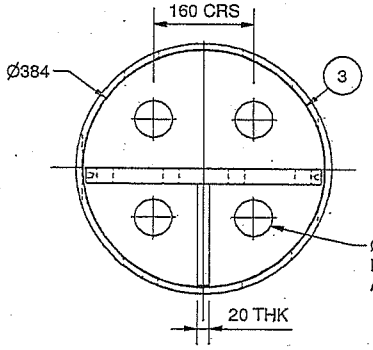


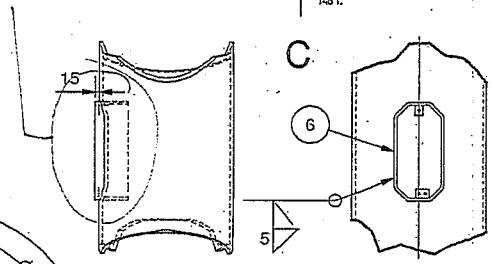




DETAIL A. SHOWING ORIENTATION OF SPLICE PLATE RELATIVE TO BEND.

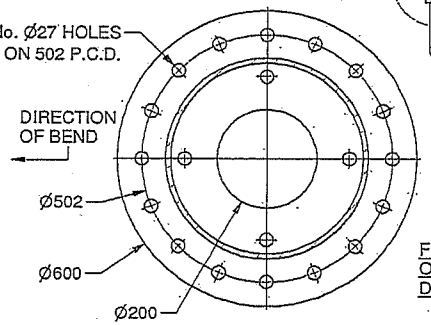
TYPICAL:
ARE YOU SURE THESE CAN'T BE FLUSHED UP?



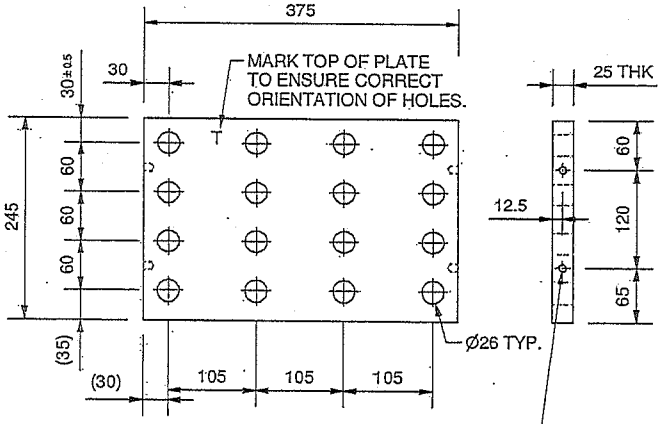


FOR DETAIL OF DOOR ASSY; SEE DRG No. T200/335/39.

B-B



FOR FURTHER DETAIL OF FP45/27/0.6/1, SEE DRG No. IM200/101/6/1.



ITEM No. PLT375/245/25/1
GRADE S355

2 No. Ø6.8 HOLES TAPPED M8x10.

Parts List for IM47/A3454/HF/A1			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	FP45/27/0.6/1	45 THK F/PLT 600DIA 16HLS 27 DIA 502PCD
2	1	IM47/A3454/HF/1/01	406DIAx10.0 CHS ROLLED LOWER SIDE BEAM
3	1	CAP38430/1	30THK CAP PLT 384DIA + HLS
4	1	PLT375/245/25/1	375x245x25THK PLATE + 26d HLS
5	1	PLT245/165/20	245x165x20 THK PLT
6	2	DC/RF/T/335	D/FRAME 300x67x8THK x 100 DEEP PRESSED

ITEM No. IM47/A3454/HF/A1 - AS SHOWN
WEIGHT: 960kg

ITEM No. IM47/A3454/HF/A1/1 - OPPOSITE HAND ON DETAIL 'A'

NOTES

1. FIRST ANGLE PROJECTION.
2. DIMENSIONS SHOWN IN BRACKETS THUS (25) ARE REF. DIMENSIONS ONLY.
3. REMOVE ALL BURRS & SHARP EDGES.
4. DO NOT SCALE IF IN DOUBT ASK!
5. WELDING SYMBOLS ARE TO BS EN ISO 4063 & BS EN 22553.
6. ALL STANDARDS & SPECIFICATIONS ARE TO BE TO THE LATEST REVISIONS.
7. FILLET WELDS TO BE TO WELD PROCEDURE No: 031W.
8. MATERIAL: CHS TO BE EN 10210 GRD S355 WITH A TENSILE STRENGTH OF 490 N/mm². PLATE FROM M.S TO BSEN 10025 GRD S355. PLATE 25mm THICK AND OVER TO BE CHARPY TEST VALUE OF 27J (MIN) AT -20°C.
9. FINISH: HOT DIP GALV TO BS EN ISO 1461.

REV	SIG	DESCRIPTION	DATE	CHD

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ISO9001 - ISO14001 OHSAS 18001

Patent No.
Reg. Design No.

General tolerances unless stated otherwise:-

0mm-500mm ± 1
501mm-1000mm ± 2
Above ± 5

Drawn L. DYE
Checked A. BOOTH
Not to scale
Date 24/08/2012

Title: ASSEMBLY DETAIL OF LOWER SIDE BEAM FOR HEADFRAME ASSY.

Sales order No. 45508

Abacus
World Leaders in Lighting

Client I.L.S.

Drg. No. IM200/101/8/4

Rea, Peter

From: Ian Smith [Ian.Smith@cox.com.au]
Sent: Monday, 3 September 2012 3:35 PM
To: Lee Dye
Cc: John Anthony; 'gsutton@dialight.com.au'; Don Gilson; Agnieszka Liso; Maginness, Ron; 'Phillip.Greenup@arup.com.au'; Chris Welbourn; Steve Forster; John Lawson; Dean Hargreaves; Andrew Willetts; Tony Staten; Stuart Harper; Gordon Humphreys; Rea, Peter
Subject: RE: Manuka mast heights (Abacus ref 45508)
Attachments: DC-6075-B063167382.pdf

Hi Lee,

We have reviewed your screen shots. Refer to attached mark-ups. We offer the following comments:

1. Knuckle cladding is looking good. Only request is that the front profile looks to bulge forward a bit too much. Can you pull this back a bit to pick up the profile of the lights more closely as per sketch?

2. Related to this, please look to wrap the cladding as far around as possible to encompass the top of the pole and conceal the ladder as much as possible.

3. Our understanding was that the poles would be tapered circular sections, not faceted, and that to date you had been showing the faceted pole indicatively. However, shop drawings received separately show poles faceted. Please confirm your intent. If faceted, is there any way we can achieve a CHS? Faceted poles will significantly impact the visual style of the whole design.

4. This may fall into the "we haven't designed it yet" category, but it looks as though if you add a bracket to the ladder at the main CHS flange connection point you will be able to subtly change its angle at the base and reduce the associated base bracket size substantially. Please look at this because current brackets are really bulky. If this is not possible the bracket should instead be open frames rather than solid plates.

Hope all this is clear, and happy to discuss. I will look at the shop drawings now, but do not anticipate any additional comments.

Cheers,

IS.

Ian Smith - Director

COX

Cox Architecture
22 Jardine Street, Kingston ACT 2604 Australia
E: Ian.Smith@cox.com.au | T: +61 2 6239 6255 | M: +61 437 037 981 | W: coxarchitecture.com.au | Disclaimer

---

From: Lee Dye [mailto:ldye@AbacusLighting.com]
Sent: Friday, 31 August 2012 11:32 PM
To: Ian Smith
Cc: John Anthony; 'gsutton@dialight.com.au'; Don Gilson; Agnieszka Liso; 'Ron.Maginness@act.gov.au'; 'Rod.Florence@act.gov.au'; 'Phillip.Greenup@arup.com.au'; Chris Welbourn; Steve Forster; John Lawson; Dean Hargreaves; Andrew Willetts; Tony Staten; Stuart Harper; Gordon Humphreys
Subject: RE: Manuka mast heights (Abacus ref 45508)

Ian,

Please find attached same views including floodlights.

Regards,

For and on behalf of Abacus Lighting Ltd

Lee Dye | Abacus Lighting
Project Engineer

Oddicroft Lane, Sutton-in-Ashfield,
Nottinghamshire, NG17 5FT, United Kingdom
Tel: +44 1623 518 286
Fax: +44 1623 523 286

www.abacuslighting.com | twitter.com/AbacusLighting
ldye@abacuslighting.com

From: Ian Smith [mailto:Ian.Smith@cox.com.au]
Sent: 31 August 2012 13:13
To: Lee Dye
Cc: Gordon Humphreys
Subject: Re: Manuka mast heights (Abacus ref 45508)

Hi Lee,

Can you send same views with spot lights on frame?

Thanks,

IS.

From: Lee Dye
Sent: 31 August 2012 09:10
To: 'Ian Smith'
Cc: John Anthony; 'gsutton@dialight.com.au'; Don Gilson; Agnieszka Liso; 'Ron.Maginness@act.gov.au'; 'Rod.Florence@act.gov.au'; 'Phillip.Greenup@arup.com.au'; Chris Welbourn; Steve Forster; John Lawson; Dean Hargreaves; Andrew Willetts; Tony Staten; Stuart Harper; Gordon Humphreys
Subject: RE: Manuka mast heights (Abacus ref 45508)

Ian,

Thanks for your comments. Please find attached screenshots of the proposed cladding shape for your approval/comments (thought it would be quicker than sending the model, but can be arranged if necessary). If you're happy with the shape we are proposing, I can go ahead and issue manufacturing details. We have hopefully achieved the more tangential shape you were requesting.

Regards,

For and on behalf of Abacus Lighting Ltd

Lee Dye | Abacus Lighting
Project Engineer

Oddicroft Lane, Sutton-in-Ashfield,
Nottinghamshire, NG17 5FT, United Kingdom
Tel: +44 1623 518 286
Fax: +44 1623 523 286

www.abacuslighting.com | twitter.com/AbacusLighting
ldye@abacuslighting.com

From: Ian Smith [mailto:Ian.Smith@cox.com.au]
Sent: 30 August 2012 09:24
To: Gordon Humphreys; Lee Dye
Cc: John Anthony; 'gsutton@dialight.com.au'; Don Gilson; Agnieszka Liso; 'Ron.Maginness@act.gov.au'; 'Rod.Florence@act.gov.au'; 'Phillip.Greenup@arup.com.au'; Chris Welbourn; Steve Forster; John Lawson; Dean Hargreaves; Andrew Willetts; Tony Staten; Stuart Harper
Subject: RE: Manuka mast heights (Abacus ref 45508)

Hi Gordon,

Thanks for getting back to me so quickly. All makes sense. Hope the shop drawing and fabrication is coming along well and is on track. Please send a model of the knuckle cladding when you have it prepared.

Ron is packing his bag in readiness for a visit (aka junket) to check out your handiwork in person – I think he plans to be there in a two to three weeks. What's he likely to see?

I'll be keen to hear what the consistency of the galvanised finish is like because we are still discussing the pros and cons of post finishing the towers at this end. The decision will depend in part on the regularity of the gal finish.

Cheers,

IS.

Ian Smith - Director

COX

Cox Architecture
22 Jardine Street, Kingston ACT 2604 Australia
E: Ian.Smith@cox.com.au | T: +61 2 6239 6255 | M: +61 437 037 981 | W: coxarchitecture.com.au | Disclaimer

From: Gordon Humphreys [mailto:ghumphreys@AbacusLighting.com]
Sent: Thursday, 30 August 2012 6:14 PM
To: Ian Smith; Lee Dye
Cc: John Anthony; 'gsutton@dialight.com.au'; Don Gilson; Agnieszka Liso; 'Ron.Maginness@act.gov.au'; 'Rod.Florence@act.gov.au'; 'Phillip.Greenup@arup.com.au'; Chris Welbourn; Steve Forster; John Lawson; Dean Hargreaves; Andrew Willetts; Tony Staten; Stuart Harper
Subject: RE: Manuka mast heights (Abacus ref 45508)

Hi Ian,

Thanks for the feedback. I'm actually quite impressed you managed to open the model given the problems we had in creating it!

The access panels on the rear of the headframe are for cabling. We have tried to make them as small and unobtrusive as possible but we do need to weld in a stiffener 'frame' to restore the strength of the tube where the cut-out is, so a flush door isn't really viable. The protrusion is only 15mm and since it is on the rear of the tube and angled inwards I think you'd struggle to see it from ground level.

AS1657 doesn't seem to specifically preclude cantilever rung style ladders although all the references are to ladders with stiles as per our current design. Our principal reason for proposing this type of ladder is that it is easier to climb

and step sideways off a ladder with stiles and also, in the event of a fall, it is preferable not to have bare ended rungs.

With regards to the knuckle area; we have been careful to ensure the slightly reposition flanges will not obstruct the line of the cladding. By using straight sections of tube below the flange it greatly simplifies the fabrication process.

Regards,

Gordon

For and on behalf of Abacus Lighting Ltd

Gordon Humphreys | Abacus Lighting
Mechanical Design Manager

Oddicroft Lane, Sutton-in-Ashfield,
Nottinghamshire, NG17 5FT, United Kingdom
Tel: +44 1623 518 230 | Mob: +44 7973 655 462

www.abacuslighting.com | twitter.com/AbacusLighting
ghumphreys@AbacusLighting.com

From: Ian Smith [mailto:Ian.Smith@cox.com.au]
Sent: 30 August 2012 02:14
To: Lee Dye
Cc: John Anthony; 'gsutton@dialight.com.au'; Don Gilson; Agnieszka Liso; 'Ron.Maginness@act.gov.au'; 'Rod.Florence@act.gov.au'; 'Phillip.Greenup@arup.com.au'; Chris Welbourn; Gordon Humphreys; Steve Forster; John Lawson; Dean Hargreaves; Andrew Willetts; Tony Staten; Stuart Harper
Subject: RE: Manuka mast heights (Abacus ref 45508)

Hi Lee,

Stu and I have reviewed. Is coming together really well – is a credit to your team. Excluding the items you noted below (the lower ladder connection, guide rail for the personnel lift, and the absence of the knuckle joint cladding) we'd have the following brief comments, noting none of them are major and we are only tabling comments if there is scope and value in adjusting without delaying you:

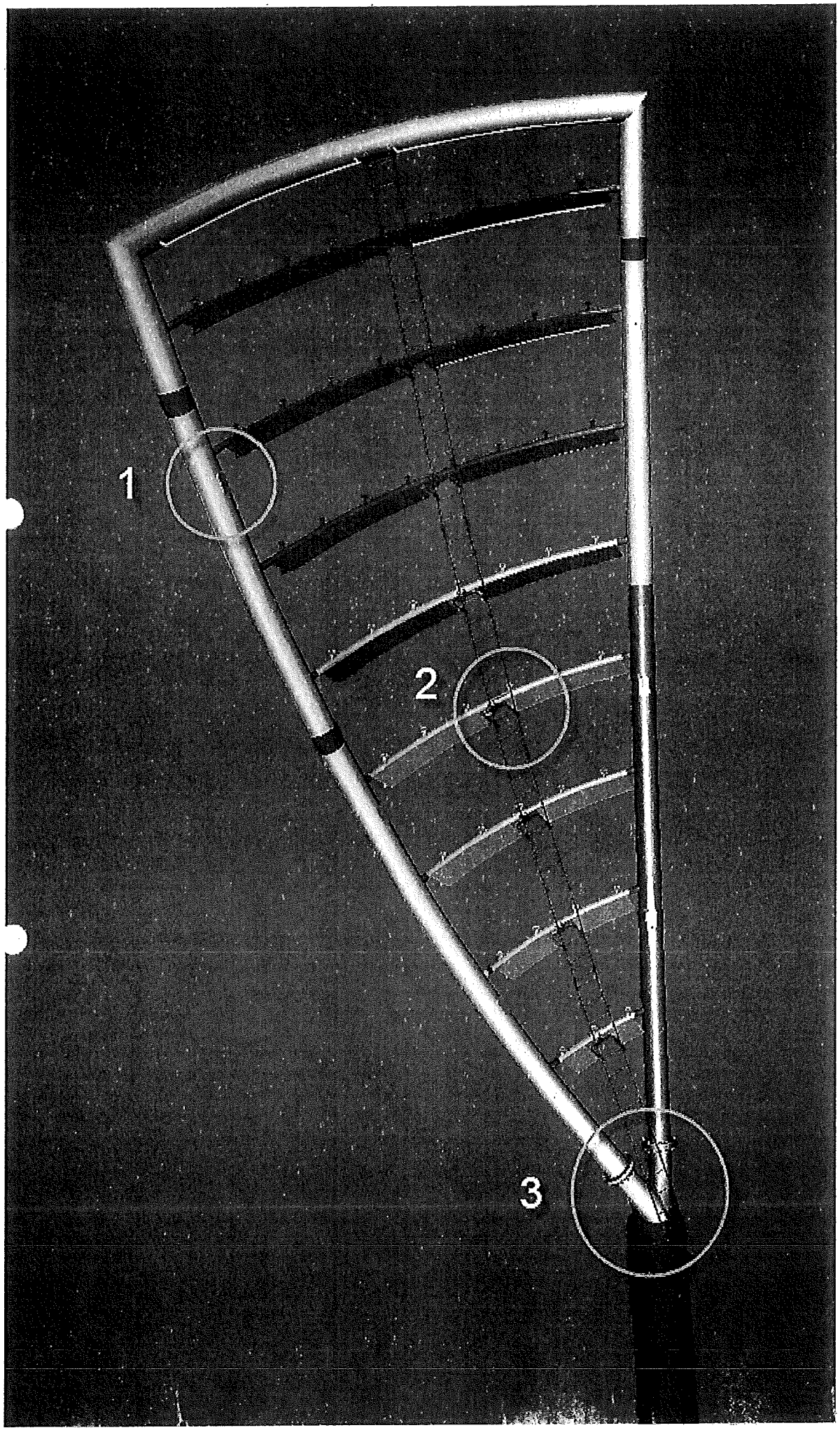
1. You are indicating some oval shaped access panels on the rear of the main head frame CHS which we presume provide access to cabling. Can the cover plates for these be curved to match the CHS profile so the cover plates are therefore fully flush with the CHS at all edges?

2. Previous versions showed the ladder as a central rail with cantilevered upturned rungs. Any reason why you have shifted to a double rail ladder? Is it local access codes? Previous was more slender, but what you are showing is also okay;

3. Base of head frame previously had bent CHS sections so the flange was horizontal and fixed to the top plate of the pole. In reconfiguring the arrangement can you please make sure that connection flanges do not encroach on the zone of the knuckle cladding and prevent it from achieving the intent of forming tangential forms between the pole and head frame in front and side elevation as per the attached email.

Thanks, and all the best.

IS.


1
2
3

Ian Smith - Director

COX

Cox Architecture
22 Jardine Street, Kingston ACT 2604 Australia
E: Ian.Smith@cox.com.au | T: +61 2 6239 6255 | M: +61 437 037 981 | W: coxarchitecture.com.au | Disclaimer

---

From: Lee Dye [mailto:ldye@AbacusLighting.com]
Sent: Wednesday, 29 August 2012 6:07 PM
To: Ian Smith
Cc: John Anthony; 'gsutton@dialight.com.au'; Don Gilson; 'david.sloan@landdata.com.au'; Agnieszka Liso; 'Ron.Maginness@act.gov.au'; 'Rod.Florence@act.gov.au'; 'Phillip.Greenup@arup.com.au'; Chris Welbourn; Gordon Humphreys; Steve Forster; John Lawson; Dean Hargreaves; Andrew Willetts; Don Gilson; Tony Staten; Stuart Harper
Subject: RE: Manuka mast heights (Abacus ref 45508)

Ian,

I have uploaded a WinRAR compression file containing the .iges file of the mast assembly to the DropBox. Please let me know if you encounter any issues trying to open the file, which is still quite large post-compression (188MB).

The compressed file is showing some of the circular elements as multi-sided on our computers, and you may experience the same thing. I'll be happy to send any screenshots of the full model if anything is unclear.

Please note there are minor issues unresolved on this model, namely the lower ladder connection and the guide rail for the personnel lift, and the absence of the knuckle joint cladding. Please ignore any anomalies in these areas.

Regards,

For and on behalf of Abacus Lighting Ltd

Lee Dye | Abacus Lighting
Project Engineer

Oddicroft Lane, Sutton-in-Ashfield,
Nottinghamshire, NG17 5FT, United Kingdom
Tel: +44 1623 518 286
Fax: +44 1623 523 286

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****
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Oddicroft Lane, Sutton in Ashfield, Nottinghamshire, UK, NG17 5FT
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www.abacuslighting.com

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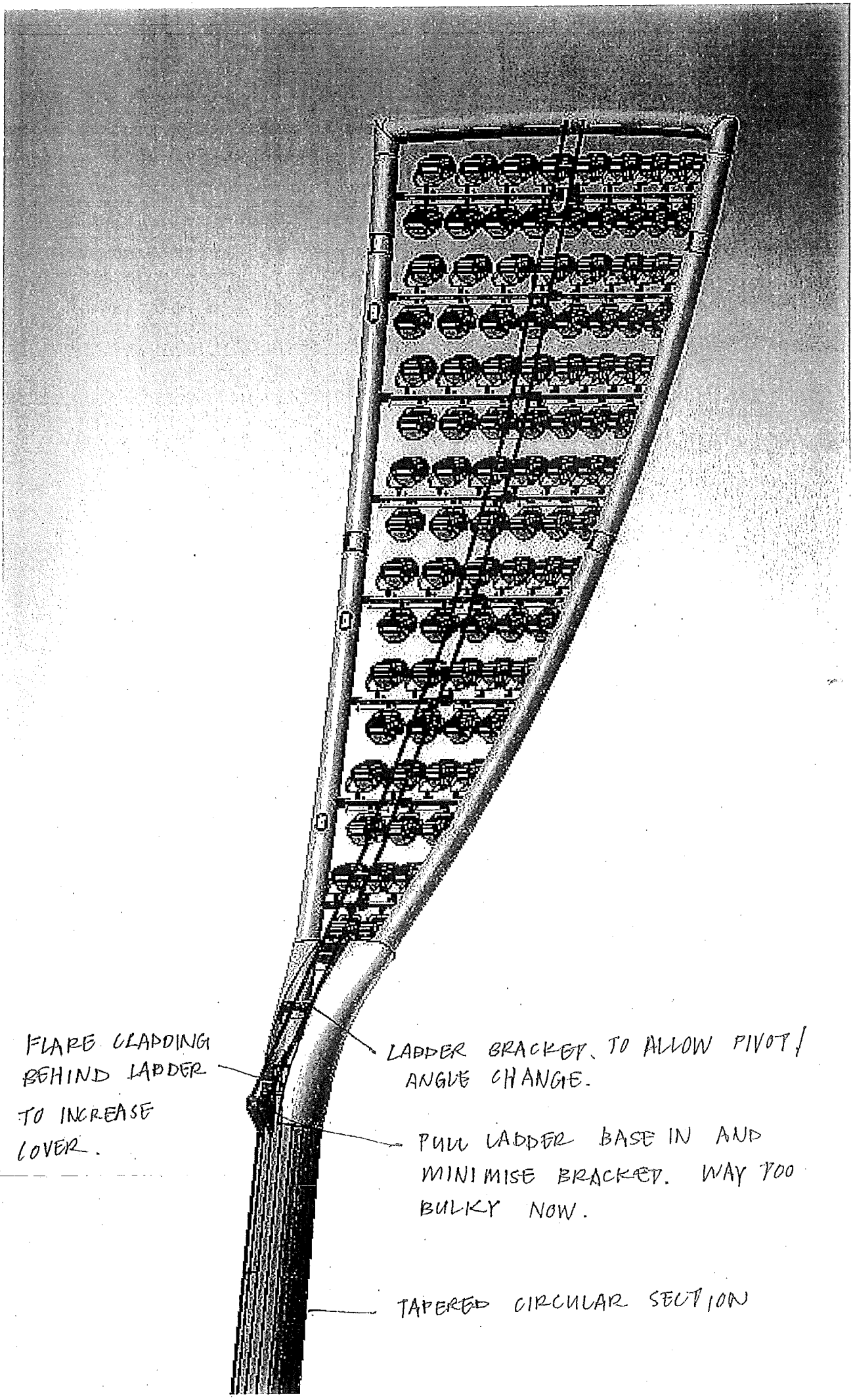
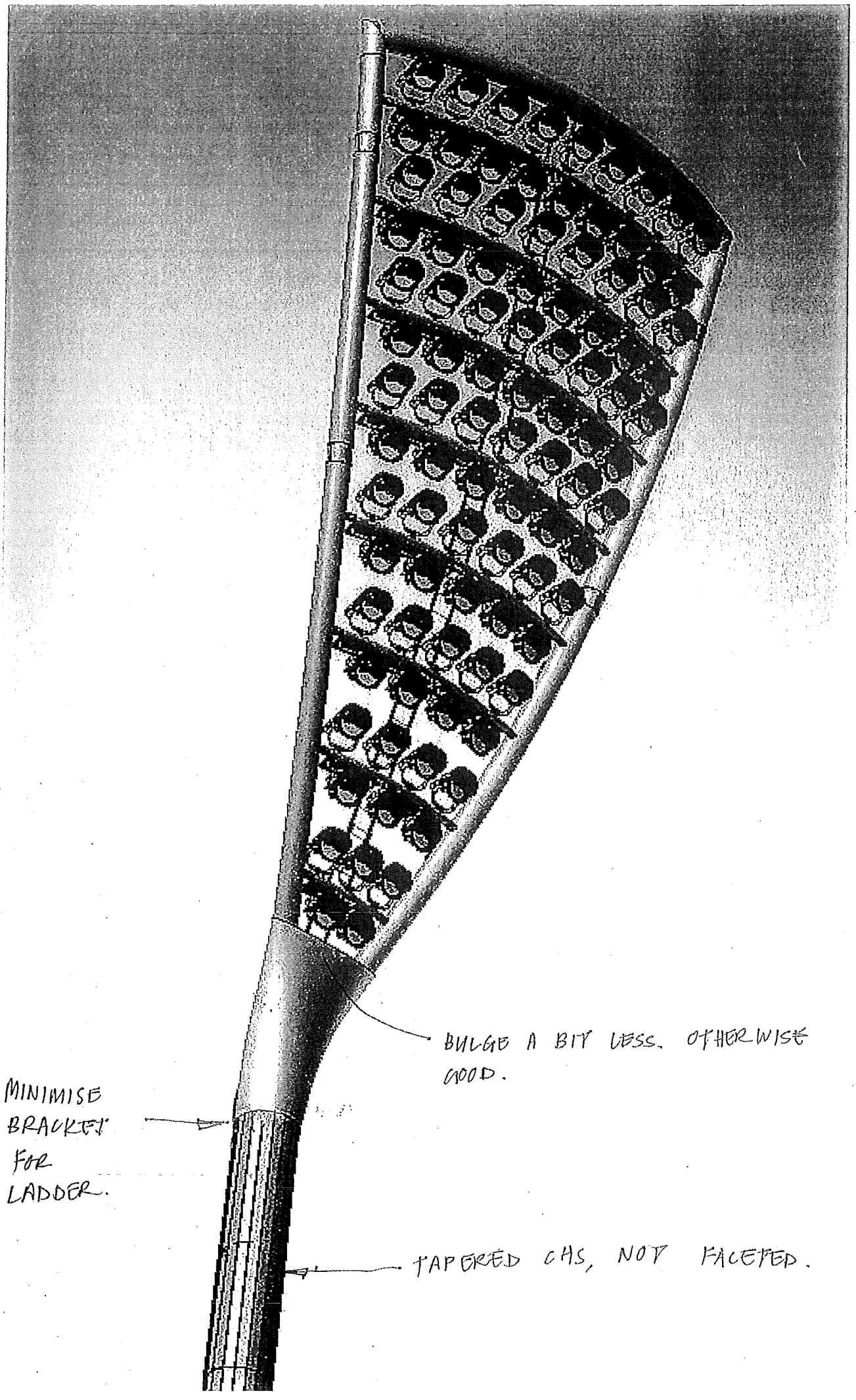
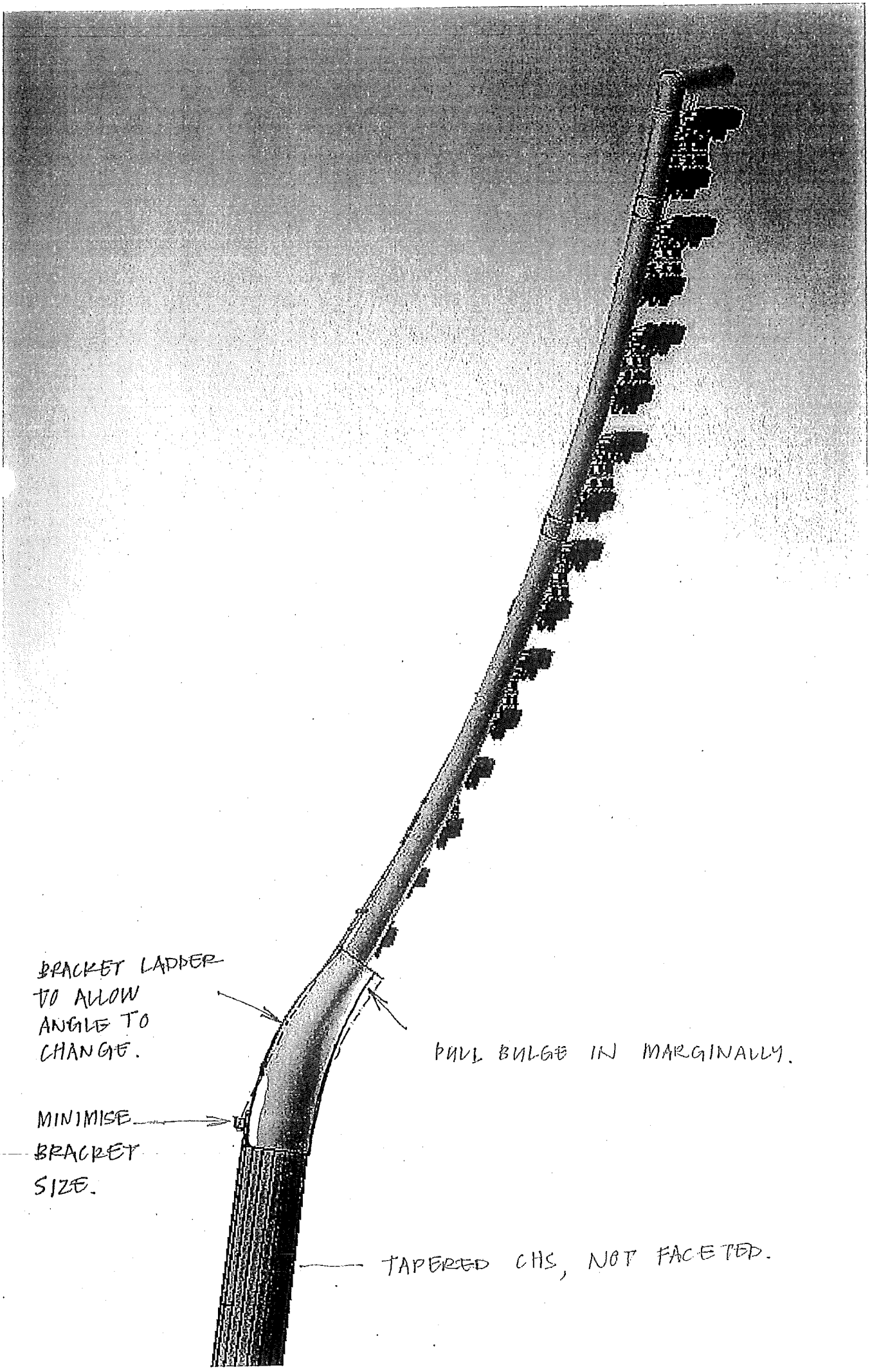

FLARE CLADDING BEHIND LADDER TO INCREASE COVER.
LADDER BRACKET. TO ALLOW PIVOT/ ANGLE CHANGE.
PULL LADDER BASE IN AND MINIMISE BRACKET. WAY TOO BULKY NOW.
TAPERED CIRCULAR SECTION


BULGE A BIT LESS. OTHERWISE GOOD.
MINIMISE BRACKET FOR LADDER.
TAPERED CHS, NOT FACETED.


BRACKET LADDER TO ALLOW ANGLE TO CHANGE.
MINIMISE BRACKET SIZE.
PULL BULGE IN MARGINALLY.
TAPERED CHS, NOT FACETED.

Rea, Peter

From: Ian Smith [Ian.Smith@cox.com.au]
Sent: Monday, 3 September 2012 2:31 PM
To: McNulty, Hamish
Cc: Rea, Peter; Don Gilson; Maginness, Ron; Florence, Rod; Don Gilson
Subject: RE: 19899 - Manuka Oval Lights
Attachments: 120903 Construction program - Rev 1.pdf; 120903 Construction program - Rev 1.mpp

Hi Hamish.

I hear you, noting that the Abacus program was issued to Dialight for their review and comment, but at our request forwarded on to us in the interim. Greg and Brendan never formally committed to the detail of drilling dates etc. so we should not be hanging our hats on specific dates except those advised for Abacus activities.

Having said that they should have had a complete program out sooner and be working to it already. It seems in effect the high level program issued by Abacus was their program and Affinity are just now getting across the detail of the civil/electrical task.

Attached program has just come in from Affinity. I will review it and how it dovetails with Abacus's stated program and go back with any comments, but if you wish feel free to do the same and advise.

IS.

Ian Smith - Director

COX

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22 Jardine Street, Kingston ACT 2604 Australia
E: Ian.Smith@cox.com.au | T: +61 2 6239 6255 | M: +61 437 037 981 | W: coxarchitecture.com.au | Disclaimer

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From: McNulty, Hamish [mailto:Hamish.McNulty@act.gov.au]
Sent: Monday, 3 September 2012 2:08 PM
To: Ian Smith
Cc: Rea, Peter; Don Gilson; Maginness, Ron; Florence, Rod; gsutton@dialight.com.au; Brendan@affinityelectrical.com.au
Subject: Re: 19899 - Manuka Oval Lights

Ian

Thanks for your message which causes me some concern. What is the point of the contractor putting out programs if there is no commitment to working to it. I think it is important that a program is developed ASAP that we can have some confidence in and plan around.

Cheers

Hamish

Hamish McNulty

Executive Director
Infrastructure & Capital Works
Economic Development Directorate
Level 6 Transact House
470 Northbourne Ave, Dickson ACT 2602
Ph: 02 6207 59674 M: 0418 619 057

Sent from my iPad

On 03/09/2012, at 2:01 PM, "Ian Smith" <Ian.Smith@cox.com.au> wrote:

All,

I spoke to Brendan. He advised that they deferred the drilling as they are still finalising the detail of their civil program and want to have that bedded down before launching in. He remains confident they are on schedule to deliver. However, he does not yet have a specific date for commencement of drilling. He advised detailed program for Civil/ground works will be issued this afternoon – I expect to see this detail on drilling in the detailed program.

I highlighted that they need to provide detail of a schedule of activities for each week and he assured me it will be in the program and that they will liaise with Matt T. on implementation.

IS.

Ian Smith - Director

<image059152.GIF>

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22 Jardine Street, Kingston ACT 2604 Australia
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From: Ian Smith
Sent: Monday, 3 September 2012 12:45 PM
To: 'Rea, Peter'; Don Gilson
Cc: Maginness, Ron; Florence, Rod; McNulty, Hamish
Subject: RE: 19899 - Manuka Oval Lights

Hi Peter,

We agree and understand on the criticality, and will maintain a strong focus. Unfortunately Don is unwell today.

In Don's absence I called Greg earlier today to ask where they are up to with rig and he is following up with Affinity. I have also left messages with Brendan Read directly to call me to advise. I'll advise as soon as I have an update.

IS.

From: Rea, Peter [mailto:Peter.Rea@act.gov.au]
Sent: Monday, 3 September 2012 12:36 PM
To: Don Gilson

Cc: Ian Smith; Maginness, Ron; Florence, Rod
Subject: 19899 - Manuka Oval Lights

Hi Don,

I have been advised by Hamish that he has been on site at Manuka Oval as we were of the understanding that a drilling rig would be on site and that works would commence today.

Could you please make contact with the contractor and advise me when commencement of work would start, additionally how are we progressing with the formalisation of the contract.

As this is a high profile and time critical project we need to be on top of this project at all times.

Regards

Peter Rea | A/g Senior Project Officer
Phone: 02 6205 4292 |Mob: 0435 966 887 | Fax: 02 6207 5468

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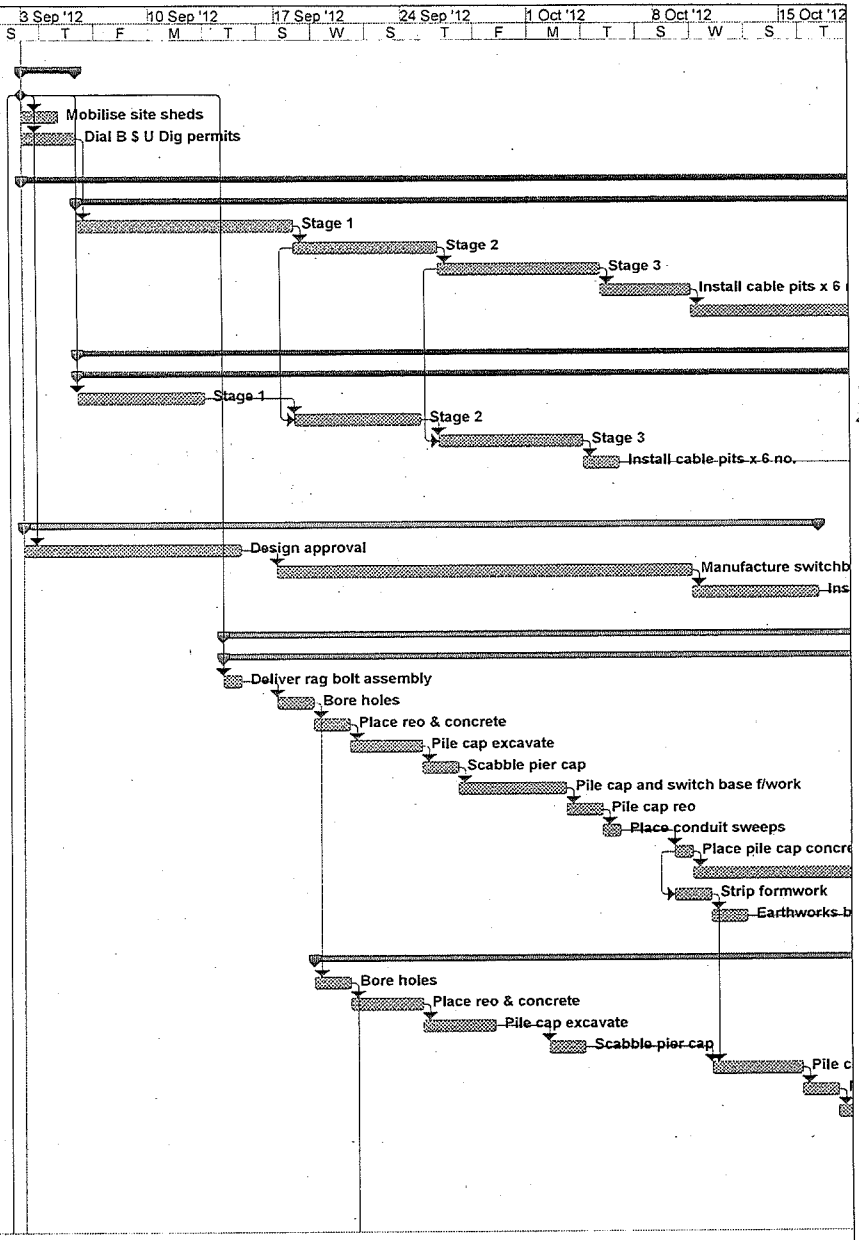
Yhuuuu

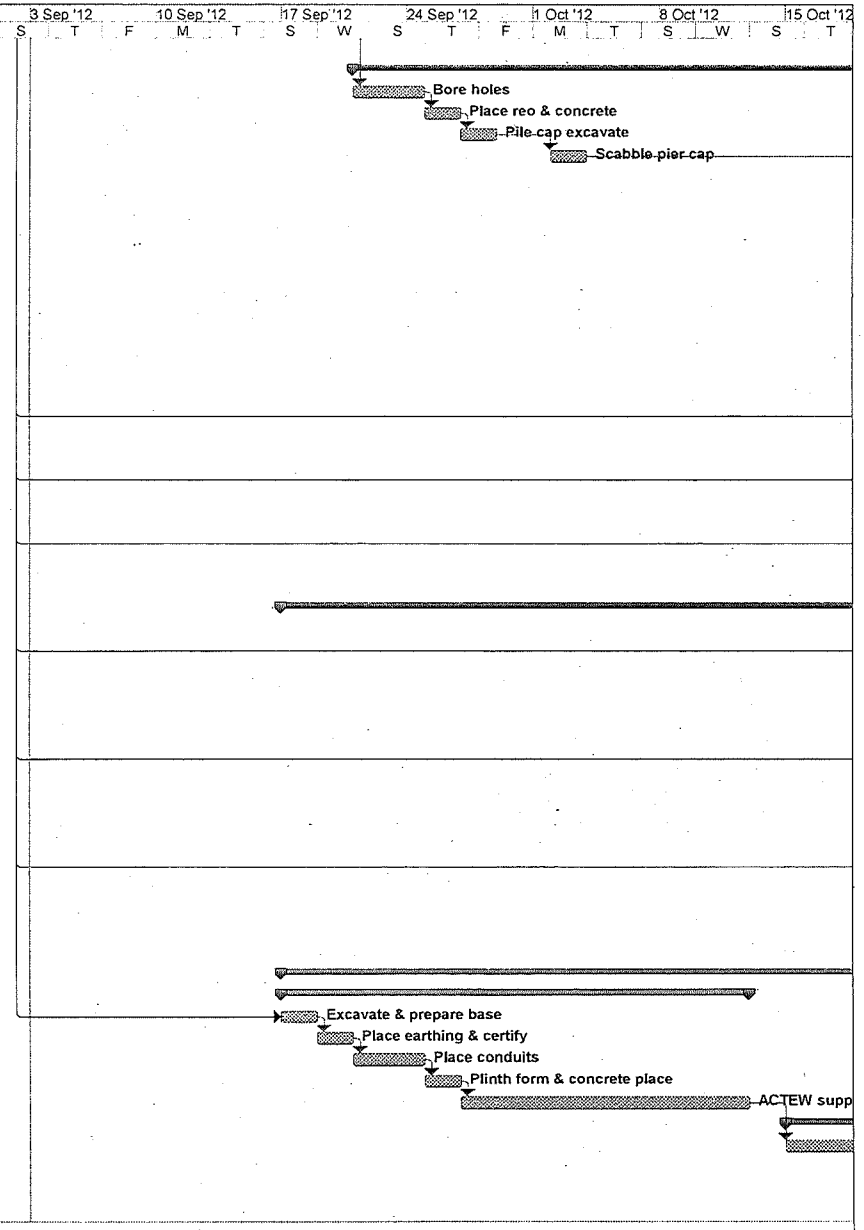
ID	Task Name	Duration	Start	Finish	Predecessors	Resource Names
1						
2	**Site establishment**	**3 days**	**Mon 3/09/12**	**Wed 5/09/12**		
3	Site possesion	0 days	Mon 3/09/12	Mon 3/09/12		
4	Mobilise site sheds	2 days	Mon 3/09/12	Tue 4/09/12	3	
5	Dial B $ U Dig permits	3 days	Mon 3/09/12	Wed 5/09/12	3	
6						
7	**Electrical conduits**	**38 days**	**Mon 3/09/12**	**Fri 26/10/12**		
8	**Directional boring & conduits installation**	**32 days**	**Thu 6/09/12**	**Tue 23/10/12**		
9	Stage 1	8 days	Thu 6/09/12	Mon 17/09/12	5	
10	Stage 2	6 days	Tue 18/09/12	Tue 25/09/12	9	
11	Stage 3	6 days	Wed 26/09/12	Thu 4/10/12	10	
12	Install cable pits x 6 no.	2 days	Fri 5/10/12	Tue 9/10/12	11	
13	Cables installation	10 days	Wed 10/10/12	Tue 23/10/12	12	
14						
15	**Communications conduits**	**35 days**	**Thu 6/09/12**	**Fri 26/10/12**		
16	**Directional boring & conduits installation**	**35 days**	**Thu 6/09/12**	**Fri 26/10/12**		
17	Stage 1	5 days	Thu 6/09/12	Wed 12/09/12	3	
18	Stage 2	5 days	Tue 18/09/12	Mon 24/09/12	17,10SS	
19	Stage 3	5 days	Wed 26/09/12	Wed 3/10/12	18,11SS	
20	Install cable pits x 6 no.	2 days	Thu 4/10/12	Fri 5/10/12	19	
21	Cables installation	3 days	Wed 24/10/12	Fri 26/10/12	20,13	
22						
23	**Switchboards**	**30 days**	**Mon 3/09/12**	**Tue 16/10/12**		
24	Design approval	10 days	Mon 3/09/12	Fri 14/09/12	3	
25	Manufacture switchboads & deliver	15 days	Mon 17/09/12	Tue 9/10/12	24	
26	Install switchboards temporarily & remove - 36 no.	5 days	Wed 10/10/12	Tue 16/10/12	25	
27						
28	**Foundations**	**54 days**	**Fri 14/09/12**	**Fri 30/11/12**		
29	**Towers 1 & 2**	**36 days**	**Fri 14/09/12**	**Tue 6/11/12**		
30	Deliver rag bolt assembly	1 day	Fri 14/09/12	Fri 14/09/12	3	
31	Bore holes	2 days	Mon 17/09/12	Tue 18/09/12	30	
32	Place reo & concrete	2 days	Wed 19/09/12	Thu 20/09/12	31	
33	Pile cap excavate	2 days	Fri 21/09/12	Mon 24/09/12	32	
34	Scabble pier cap	2 days	Tue 25/09/12	Wed 26/09/12	33	
35	Pile cap and switch base f/work	3 days	Thu 27/09/12	Tue 2/10/12	34	
36	Pile cap reo	2 days	Wed 3/10/12	Thu 4/10/12	35	
37	Place conduit sweeps	1 day	Fri 5/10/12	Fri 5/10/12	36	
38	Place pile cap concrete & switchboard base	1 day	Tue 9/10/12	Tue 9/10/12	37	
39	Concrete cure	20 days	Wed 10/10/12	Tue 6/11/12	38	
40	Strip formwork	2 days	Tue 9/10/12	Wed 10/10/12	38SS	
41	Earthworks backfill	2 days	Thu 11/10/12	Fri 12/10/12	40	
42						
43	**Towers 3 & 4**	**42 days**	**Wed 19/09/12**	**Mon 19/11/12**		
44	Bore holes	2 days	Wed 19/09/12	Thu 20/09/12	31	
45	Place reo & concrete	2 days	Fri 21/09/12	Mon 24/09/12	44	
46	Pile cap excavate	4 days	Tue 25/09/12	Fri 28/09/12	45	
47	Scabble pier cap	2 days	Tue 2/10/12	Wed 3/10/12	46	
48	Pile cap and switch base f/work	3 days	Thu 11/10/12	Mon 15/10/12	47,40	
49	Pile cap reo	2 days	Tue 16/10/12	Wed 17/10/12	48	
50	Place conduit sweeps	1 day	Thu 18/10/12	Thu 18/10/12	49	
51	Place pile cap concrete & switchboard base	1 day	Fri 19/10/12	Fri 19/10/12	50	
52	Place pile cap concrete	1 day	Mon 22/10/12	Mon 22/10/12	51	
53	Concrete cure	20 days	Tue 23/10/12	Mon 19/11/12	52	
54	Strip formwork	2 days	Mon 22/10/12	Tue 23/10/12	52SS	
55	Earthworks backfill	2 days	Wed 24/10/12	Thu 25/10/12	54,41	



Project: 120903 Construction program
Date: Mon 3/09/12

Task	Rolled Up Critical Task	Project Summary	Inactive Summary	Start-only	
Critical Task	Rolled Up Milestone	Group By Summary	Manual Task	Finish-only	
Milestone	Rolled Up Progress	Inactive Task	Duration-only	Progress	
Summary	Split	Inactive Task	Manual Summary Rollup	Deadline	
Rolled Up Task	External Tasks	Inactive Milestone	Manual Summary		

ID	Task Name	Duration	Start	Finish	Predecessors	Resource Names
56						
57	**Towers 5 & 6**	**49 days**	**Fri 21/09/12**	**Fri 30/11/12**		
58	Bore holes	2 days	Fri 21/09/12	Mon 24/09/12	44	
59	Place reo & concrete	2 days	Tue 25/09/12	Wed 26/09/12	58	
60	Pile cap excavate	2 days	Thu 27/09/12	Fri 28/09/12	59	
61	Scabble pier cap	2 days	Tue 2/10/12	Wed 3/10/12	60	
62	Pile cap and switch base f/work	3 days	Wed 24/10/12	Fri 26/10/12	61,54	
63	Pile cap reo	2 days	Mon 29/10/12	Tue 30/10/12	62	
64	Place conduit sweeps	1 day	Wed 31/10/12	Wed 31/10/12	63	
65	Place pile cap concrete & switchboard base	1 day	Thu 1/11/12	Thu 1/11/12	64	
66	Place pile cap concrete	1 day	Fri 2/11/12	Fri 2/11/12	65	
67	Concrete cure	20 days	Mon 5/11/12	Fri 30/11/12	66	
68	Strip formwork	2 days	Fri 2/11/12	Mon 5/11/12	66SS	
69	Earthworks backfill	2 days	Tue 6/11/12	Wed 7/11/12	68,55	
70						
71	**Headframes**	**18 days**	**Wed 14/11/12**	**Fri 7/12/12**		
72	**Headframes 1& 2**	**6 days**	**Wed 14/11/12**	**Wed 21/11/12**		
73	Deliver to site	1 day	Wed 14/11/12	Wed 14/11/12	3SS+50 days	
74	Assemble	5 days	Thu 15/11/12	Wed 21/11/12	73	
75	**Headframes 3 & 4**	**6 days**	**Fri 23/11/12**	**Fri 30/11/12**		
76	Deliver to site	1 day	Fri 23/11/12	Fri 23/11/12	73,3SS+57 days	
77	Assemble	5 days	Mon 26/11/12	Fri 30/11/12	76,74	
78	**Headframes 5 & 6**	**7 days**	**Thu 29/11/12**	**Fri 7/12/12**		
79	Deliver to site	1 day	Thu 29/11/12	Thu 29/11/12	3SS+61 days,73	
80	Assemble	5 days	Mon 3/12/12	Fri 7/12/12	79,77	
81						
82	**Masts**	**65 days**	**Mon 17/09/12**	**Tue 18/12/12**		
83	**Masts 1 & 2**	**13 days**	**Wed 14/11/12**	**Fri 30/11/12**		
84	Deliver to site	1 day	Wed 14/11/12	Wed 14/11/12	3SS+50 days,26	
85	Assemble	3 days	Thu 15/11/12	Mon 19/11/12	84	
86	Lift mast	2 days	Thu 22/11/12	Fri 23/11/12	74,85,39	
87	Switchboards install & fit-off	5 days	Mon 26/11/12	Fri 30/11/12	86,21	
88	**Masts 3 & 4**	**11 days**	**Fri 23/11/12**	**Fri 7/12/12**		
89	Deliver to site	1 day	Fri 23/11/12	Fri 23/11/12	3SS+57 days,26	
90	Assemble	3 days	Mon 26/11/12	Wed 28/11/12	89,85	
91	Lift mast	2 days	Thu 29/11/12	Fri 30/11/12	90,53	
92	Switchboards install & fit-off	5 days	Mon 3/12/12	Fri 7/12/12	91,87	
93	**Masts 5 & 6**	**14 days**	**Thu 29/11/12**	**Tue 18/12/12**		
94	Deliver to site	1 day	Thu 29/11/12	Thu 29/11/12	89,3SS+61 days	
95	Assemble	3 days	Fri 30/11/12	Tue 4/12/12	94,90	
96	Lift mast	2 days	Mon 10/12/12	Tue 11/12/12	95,80,67	
97	Switchboards install & fit-off	5 days	Wed 12/12/12	Tue 18/12/12	96,92	
98						
99	**Substation enclosure**	**35 days**	**Mon 17/09/12**	**Tue 6/11/12**		
100	**Transformers & plinths**	**18 days**	**Mon 17/09/12**	**Fri 12/10/12**		
101	Excavate & prepare base	2 days	Mon 17/09/12	Tue 18/09/12	3SS+10 days	
102	Place earthing & certify	2 days	Wed 19/09/12	Thu 20/09/12	101	
103	Place conduits	2 days	Fri 21/09/12	Mon 24/09/12	102	
104	Plinth form & concrete place	2 days	Tue 25/09/12	Wed 26/09/12	103	
105	ACTEW supply & place cabinet x 2 no.	10 days	Thu 27/09/12	Fri 12/10/12	104	
106	**Enclosure Blockwalling**	**17 days**	**Mon 15/10/12**	**Tue 6/11/12**		
107	Footings & switchboard slab	5 days	Mon 15/10/12	Fri 19/10/12	105	
108	Place switchboard	2 days	Mon 22/10/12	Tue 23/10/12	107	
109	Blockwork	5 days	Wed 24/10/12	Tue 30/10/12	108	
110	Fencing	5 days	Wed 31/10/12	Tue 6/11/12	109	



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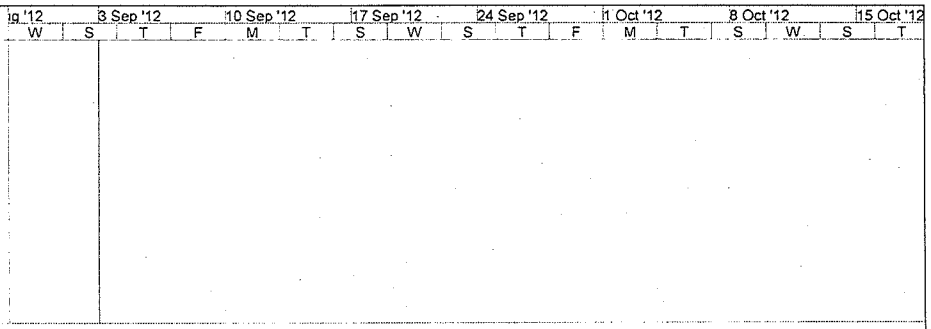
Rolled Up Task	External Tasks	Inactive Milestone	Manual Summary		

ID	Task Name	Duration	Start	Finish	Predecessors	Resource Names
111						
112	**Reinstatement works**	**10 days**	**Wed 19/12/12**	**Wed 9/01/13**		
113	Repair asphalt and concrete surfaces	5 days	Wed 19/12/12	Wed 2/01/13	109,97,110	
114	Landscape works	5 days	Thu 3/01/13	Wed 9/01/13	113,69	
115						
116	**Testing & commissioning**	**19 days**	**Wed 19/12/12**	**Tue 22/01/13**		
117	ACTPLA certification	5 days	Wed 19/12/12	Wed 2/01/13	97	
118	Energise lights	2 days	Tue 8/01/13	Wed 9/01/13	117FS+3 days	
119	Aim lights & check light intensities	9 days	Thu 10/01/13	Tue 22/01/13	118	
120						
121	**Completion**	**1 day**	**Wed 23/01/13**	**Wed 23/01/13**		
122	Final inspections	1 day	Wed 23/01/13	Wed 23/01/13	119	
123	Practical completion	0 days	Wed 23/01/13	Wed 23/01/13	122,114	



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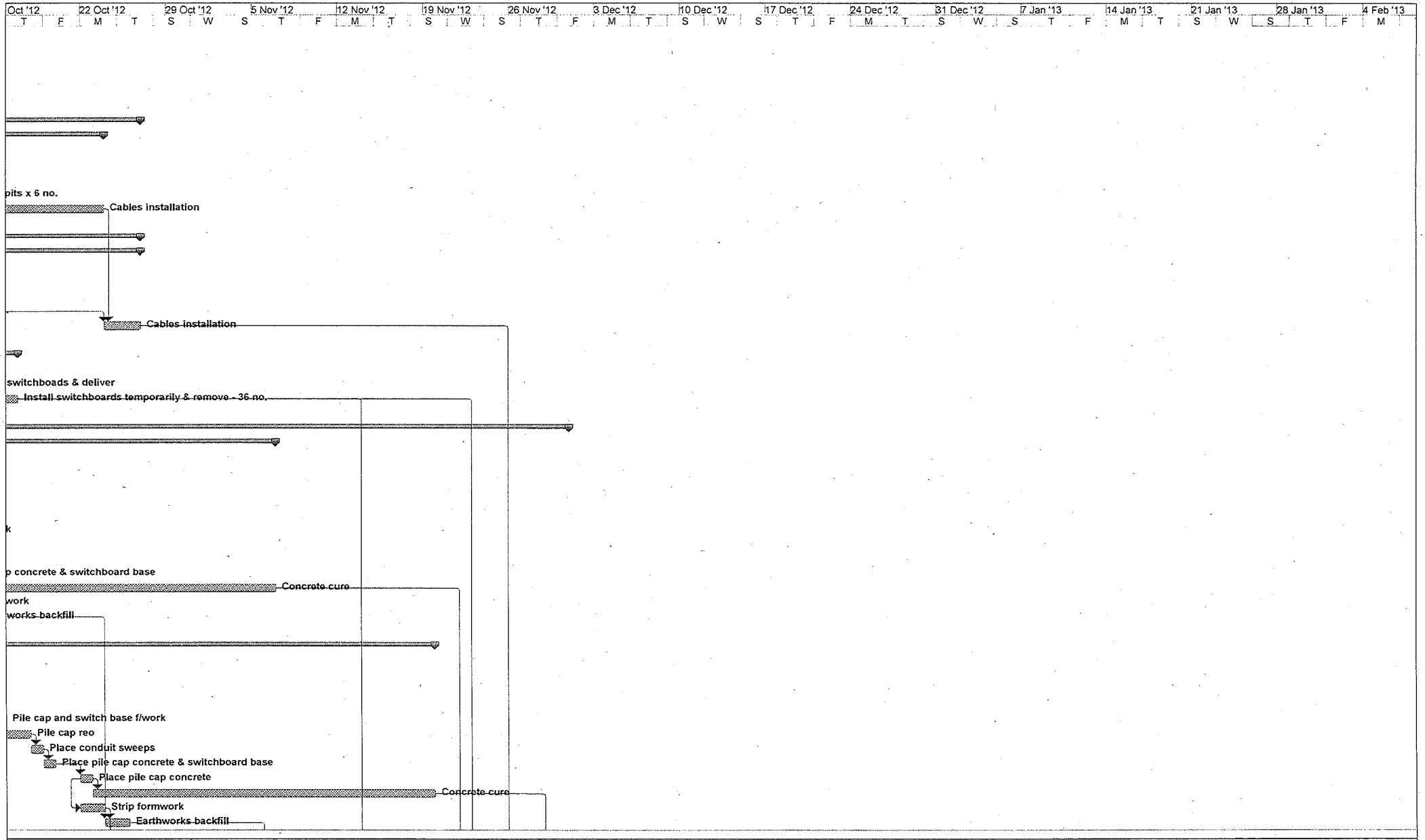

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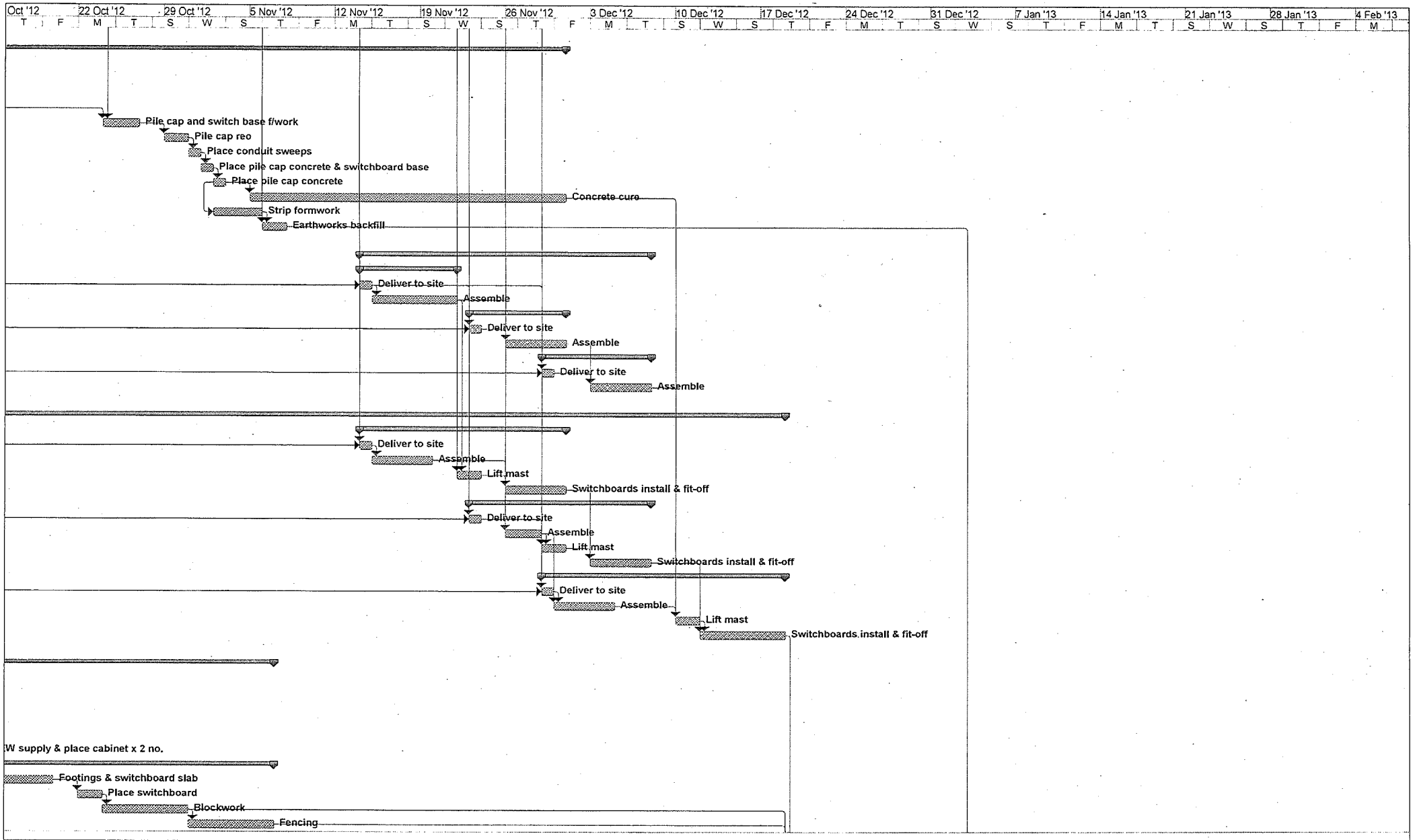

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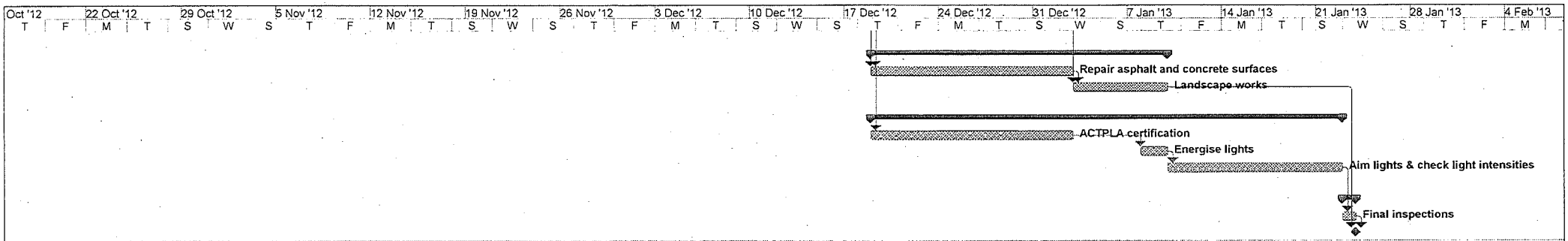

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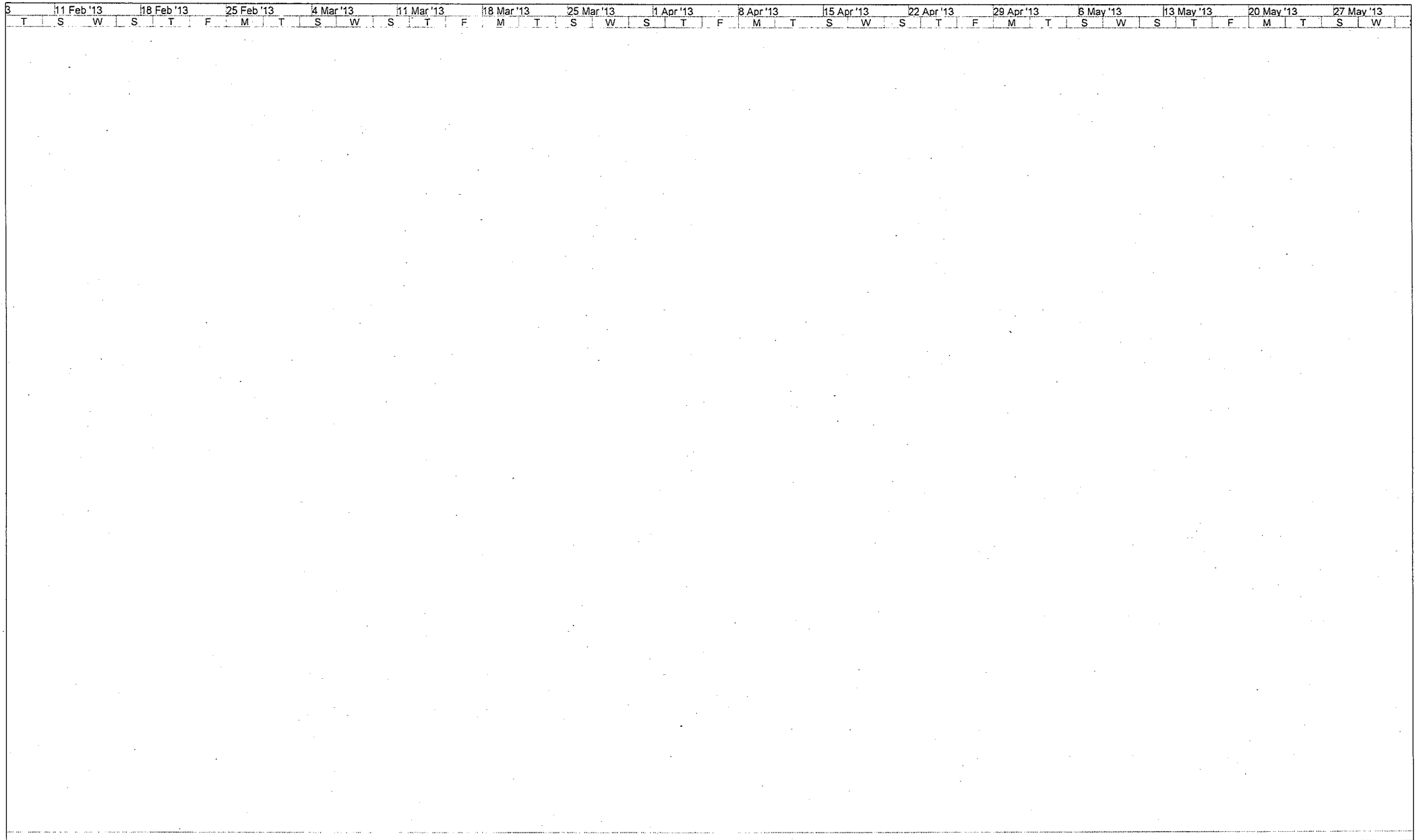

Project: 120903 Construction program
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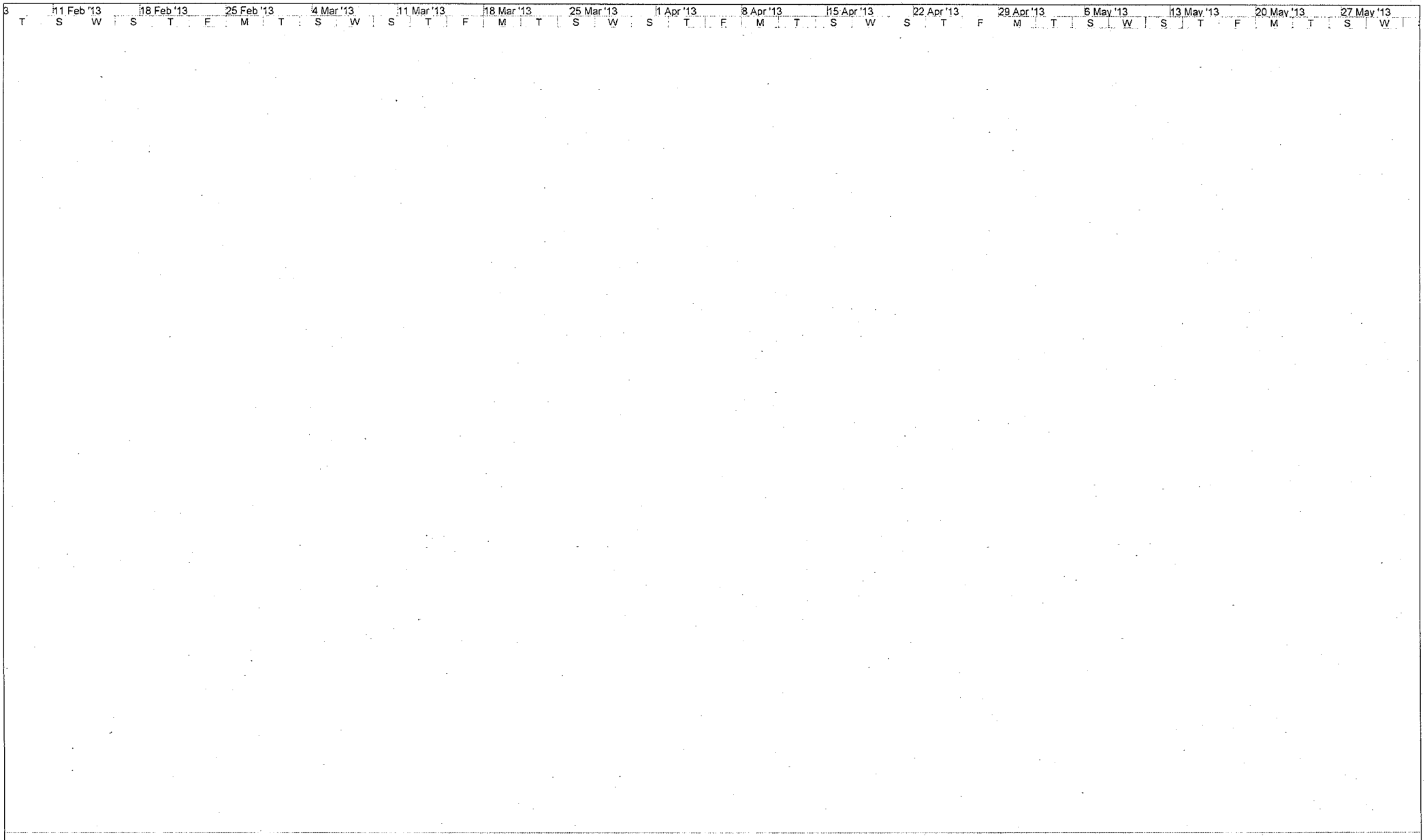
3
11 Feb '13
18 Feb '13
25 Feb '13
4 Mar '13
11 Mar '13
18 Mar '13
25 Mar '13
1 Apr '13
8 Apr '13
15 Apr '13
22 Apr '13
29 Apr '13
6 May '13
13 May '13
20 May '13
27 May '13
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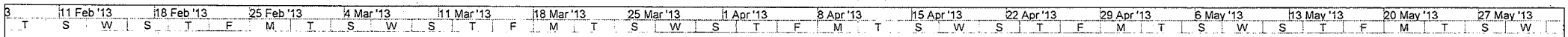
Project: 120903 Construction program
Date: Mon 3/09/12
Task
Critical Task
Milestone
Summary
Rolled Up Task
Rolled Up Critical Task
Rolled Up Milestone
Rolled Up Progress
Split
External Tasks
Project Summary
Group By Summary
Inactive Task
Inactive Task
Inactive Milestone
Inactive Summary
Manual Task
Duration-only
Manual Summary Rollup
Manual Summary
Start-only
Finish-only
Progress
Deadline



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Rolled Up Task	External Tasks	Inactive Milestone	Manual Summary		

Rea, Peter

From: McNulty, Hamish
Sent: Monday, 3 September 2012 2:08 PM
To: Ian Smith
Cc: Rea, Peter; Don Gilson; Maginness, Ron; Florence, Rod; gsutton@dialight.com.au; Brendan@affinityelectrical.com.au
Subject: Re: 19899 - Manuka Oval Lights

Ian

Thanks for your message which causes me some concern. What is the point of the contractor putting out programs if there is no commitment to working to it. I think it is important that a program is developed ASAP that we can have some confidence in and plan around.

Cheers

Hamish

ɜmish McNulty
Executive Director
Infrastructure & Capital Works
Economic Development Directorate
Level 6 Transact House
470 Northbourne Ave, Dickson ACT 2602
Ph: 02 6207 59674 M: 0418 619 057

Sent from my iPad

On 03/09/2012, at 2:01 PM, "Ian Smith" <Ian.Smith@cox.com.au> wrote:

> All,
>
> I spoke to Brendan. He advised that they deferred the drilling as they are still finalising the detail of their civil program and want to have that bedded down before launching in. He remains confident they are on schedule to deliver. However, he does not yet have a specific date for commencement of drilling. He advised detailed program for Civil/ground works will be issued this afternoon – I expect to see this detail on drilling in the detailed program.
>
> I highlighted that they need to provide detail of a schedule of activities for each week and he assured me it will be in the program and that they will liaise with Matt T. on implementation.
>
> IS.
>
> **Ian Smith** - Director
>
> **<image059152.GIF>**
>
> **Cox Architecture**
> 22 Jardine Street, Kingston ACT 2604 Australia
> E: Ian.Smith@cox.com.au | T: +61 2 6239 6255 | M: +61 437 037 981 | W: coxarchitecture.com.au | Disclaimer

From: Ian Smith
Sent: Monday, 3 September 2012 12:45 PM
To: 'Rea, Peter'; Don Gilson
Cc: Maginness, Ron; Florence, Rod; McNulty, Hamish
Subject: RE: 19899 - Manuka Oval Lights

Hi Peter,

We agree and understand on the criticality, and will maintain a strong focus. Unfortunately Don is unwell today.

In Don's absence I called Greg earlier today to ask where they are up to with rig and he is following up with Affinity. I have also left messages with Brendan Read directly to call me to advise. I'll advise as soon as I have an update.

IS.

From: Rea, Peter [mailto:Peter.Rea@act.gov.au]
Sent: Monday, 3 September 2012 12:36 PM
To: Don Gilson
Cc: Ian Smith; Maginness, Ron; Florence, Rod
Subject: 19899 - Manuka Oval Lights

Hi Don,

I have been advised by Hamish that he has been on site at Manuka Oval as we were of the understanding that a drilling rig would be on site and that works would commence today.

Could you please make contact with the contractor and advise me when commencement of work would start, additionally how are we progressing with the formalisation of the contract.

As this is a high profile and time critical project we need to be on top of this project at all times.

Regards

Peter Rea | A/g Senior Project Officer
Phone: 02 6205 4292 |Mob: 0435 966 887 | Fax: 02 6207 5468

Shared Services Procurement | Treasury | **ACT Government**
Level 3 North, **DPMH**, 16 Challis Street Dickson ACT 2602 | GPO Box 818 Dickson ACT 2602 | www.act.gov.au

<image001.png>

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Rea, Peter

From: Ian Smith [Ian.Smith@cox.com.au]
Sent: Monday, 3 September 2012 12:45 PM
To: Rea, Peter; Don Gilson
Cc: Maginness, Ron; Florence, Rod; McNulty, Hamish
Subject: RE: 19899 - Manuka Oval Lights

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In Don's absence I called Greg earlier today to ask where they are up to with rig and he is following up with Affinity. I have also left messages with Brendan Read directly to call me to advise. I'll advise as soon as I have an update.

IS.

Ian Smith - Director

COX

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Sent: Monday, 3 September 2012 12:36 PM
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Cc: Ian Smith; Maginness, Ron; Florence, Rod
Subject: 19899 - Manuka Oval Lights

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Regards

Peter Rea | A/g Senior Project Officer
Phone: 02 6205 4292 |Mob: 0435 966 887 | Fax: 02 6207 5468

Shared Services Procurement | Treasury | **ACT Government**
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Treasury

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Rea, Peter

From: Ian Smith [Ian.Smith@cox.com.au]
Sent: Thursday, 30 August 2012 4:47 PM
To: Scott Cauchi
Cc: 'gsutton@dialight.com.au'; Maginness, Ron; Rea, Peter; Don Gilson; Tokley, Matthew; Brendan@affinityelectrical.com.au; Florence, Rod
Subject: Manuka Oval Lights - Possession of Site
Attachments: 120830 Manuka Lighting - Possession of Site.pdf

Dear Scott,

Please see attached letter granting Possession of Site at Manuka Oval. Please confirm receipt by return email asap.

Cheers,

IS.

Ian Smith - Director

COX

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000039

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ABU DHABI

ARCHITECTURE
PLANNING
URBAN DESIGN
INTERIOR DESIGN

30 August 2012

Dialight ILS
Unit 4/ 42 Collingwood Street
Osborne Park WA 6017
Attention: Mr Scott Cauchi

Via Email: scauchi@dialight.com.au

COX

Re: Design and Construct of Fixed Sports Lighting at Manuka Oval

Possession of Site

Dear Scott,

On Behalf of Shared Services Procurement, and pursuant to Clause 27 of the Australian Standard General Condition of Contract (AS4300 – 1995), you are hereby granted Possession of the Site for the performance of Contract No. 2012.19899.111.

Note that Possession of Site does not mean unlimited access to the whole of the site. As indicated in the Tender/Contract Documents and at the initial Site Meeting, Manuka Oval will continue to operate as a venue for various activities throughout the contract period.

Therefore, possession will be limited to the areas required for the Contractor to carry out the works on a basis agreed with the venue manager. This agreement, however, will be on a basis to ensure the program of the works is not interrupted.

Your attention is drawn to the requirement of Clause 35 that the Contractor shall promptly commence the work at the site.

Yours faithfully

Ian A Smith
Director

For Don Gilson – Superintendent

Cox Architecture Pty Ltd
ACN 002 635 891
Nominated Architects
Graham Humphries No. 716
Rodney Moss No. 946
22 Jardine Street
Kingston ACT 2604 Australia
T +61 2 6239 6255
www.coxarchitecture.com.au

Rea, Peter

From: John Anthony [JAnthony@AbacusLighting.com]
Sent: Thursday, 30 August 2012 7:18 PM
To: Rea, Peter
Cc: John Lawson; Chris Welbourn; Andrew Morris-Richardson; Tony Staten; Greg Sutton
Subject: MANUKA

Dear Peter,

At long, long last, the Performance Guarantee is now through the banks and has now, I believe, been issued to you. This must be a world record in the time it has taken to come about and hasn't really helped us as we would have liked the upfront payment some time ago. The banks will only operate at their pace which is slow, to say the least, since we have worked on a back to back arrangement with both our bank the ILS Australian bank. However, you have said that the moment you receive the PG the 10% upfront payment would be immediately released. We hope the ACT can move quickly on this.

Please be assured that this has not held up progress on the production as we have now moved into manufacturing on a 24 hour nonstop cycle to include Saturdays and Sundays to try to keep to schedule.

For and on behalf of Abacus Lighting

John Anthony | Abacus Lighting
Export Sales Director

Mob +44 (0)7770 730 442
email janthony@abacuslighting.com

twitter.com/AbacusLighting

****
Abacus Lighting Limited
Oddicroft Lane, Sutton in Ashfield, Nottinghamshire, UK, NG17 5FT
Company Registration Number: 612235
Telephone: +44 (0)1623 511 111 Fax: +44 (0)1623 552 133
www.abacuslighting.com

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Rea, Peter

From: Greg Sutton [gsutton@dialight.com.au]
Sent: Tuesday, 28 August 2012 11:29 AM
To: Ian Smith; Brendan@affinityelectrical.com.au
Cc: Rea, Peter; Tokley, Matthew; Maginness, Ron; Don Gilson; Lee Dye; Gordon Humphreys; Agnieszka Liso; Stuart Harper
Subject: RE: Manuka Lighting - T2 Set out

Thanks Ian,
I will be discussing this and other issues with Abacus tonight.

Regards
Greg Sutton
0419 917 880

From: Ian Smith [mailto:Ian.Smith@cox.com.au]
Sent: Tuesday, 28 August 2012 11:00 AM
To: Greg Sutton; Brendan@affinityelectrical.com.au
Cc: Peter Rea (Peter.Rea@act.gov.au); Tokley, Matthew; Maginness, Ron; Don Gilson; Lee Dye; Gordon Humphreys; Agnieszka Liso; Stuart Harper
Subject: Manuka Lighting - T2 Setout

Hi Greg,

As discussed at the site meeting, I have reviewed the setout of T2 and there is no planning or functional issue I can see with pushing T2 back the metre or two to avoid damaging the existing road surface adjacent. As discussed please minimise the move to minimise the impact on the adjacent tree and the symmetry of the pole arrangement.

I note it is up to you to ensure the move is acceptable to Abacus and does not generate issues with the Bradman roof casting shadows on the field etc.

Cheers,

IS.

Ian Smith - Director

COX

Cox Architecture
22 Jardine Street, Kingston ACT 2604 Australia
E: Ian.Smith@cox.com.au | T: +61 2 6239 6255 | M: +61 437 037 981 | W: coxarchitecture.com.au | Disclaimer

Rea, Peter

From: Ian Smith [Ian.Smith@cox.com.au]
Sent: Tuesday, 21 August 2012 1:59 PM
To: Maginness, Ron
Cc: McNulty, Hamish; Rea, Peter
Subject: RE: Manuka mast heights (Abacus ref 45508)

Ron,

I can't answer these questions. I have put the issue back to Tony and co and will follow up. I agree the heights need to be consistent, and the base detail a sensible proportion. I will chase up.

IS.

Ian Smith - Director

COX

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---

From: Maginness, Ron [mailto:Ron.Maginness@act.gov.au]
Sent: Tuesday, 21 August 2012 1:35 PM
To: Ian Smith
Cc: McNulty, Hamish; Rea, Peter
Subject: RE: Manuka mast heights (Abacus ref 45508)

Ian,

Is it possible to:

- Make three heights of poles – one for T1, one for T2,T6, and one for T3,T4,T5, with the minor differences being taken up different plinth heights, OR
- Make them all the same based on the shortest length (T1) and then have make up sleeves tailor made for each pole to take up the difference in heights.

We just can't have a 2.85m high plinth in front of the caretakers cottage.

R

Ron Maginness| Consultant Project Manager|

| phone: (02) 6207 9035| fax: (02) 6207 0123| mob: 0418 628 649

Economic Development Directorate | ACT Government |

Level 6, TransACT House, 470 Northbourne Avenue, Dickson ACT 2602, GPO Box 158 Canberra ACT 2601

www.economicdevelopment.act.gov.au

Please consider the environment before printing this e-mail.

From: Ian Smith [mailto:Ian.Smith@cox.com.au]
Sent: Tuesday, 21 August 2012 11:33 AM
To: McNulty, Hamish

Cc: Maginness, Ron
Subject: FW: Manuka mast heights (Abacus ref 45508)

FYI...

Ian Smith - Director

COX

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22 Jardine Street, Kingston ACT 2604 Australia
E: Ian.Smith@cox.com.au | T: +61 2 6239 6255 | M: +61 437 037 981 | W: coxarchitecture.com.au | Disclaimer

---

From: Ian Smith
Sent: Tuesday, 21 August 2012 8:23 AM
To: 'Tony Staten'
Cc: John Anthony; 'gsutton@dialight.com.au'; Lee Dye; Don Gilson; 'david.sloan@landdata.com.au'; Agnieszka Liso; 'Ron.Maginness@act.gov.au'; 'Rod.Florence@act.gov.au'; 'Phillip.Greenup@arup.com.au'; Chris Welbourn; Gordon Humphreys; Steve Forster; John Lawson; Dean Hargreaves; Andrew Willetts; Don Gilson
Subject: RE: Manuka mast heights (Abacus ref 45508)

Hi Tony,

In that case you need to show us what you are proposing. How are you dealing with the 2.85m level variance across the site? See attached.

Please issue all drawings produced to date for towers/head frames and footings so we can flag any issues, noting that we will not request any changes unless there are critical issues to be resolved.

Regards,

IS.

From: Tony Staten [mailto:AStaten@AbacusLighting.com]
Sent: Monday, 20 August 2012 9:36 PM
To: Ian Smith
Cc: John Anthony; 'gsutton@dialight.com.au'; Lee Dye; Don Gilson; 'david.sloan@landdata.com.au'; Agnieszka Liso; 'Ron.Maginness@act.gov.au'; 'Rod.Florence@act.gov.au'; 'Phillip.Greenup@arup.com.au'; Chris Welbourn; Gordon Humphreys; Steve Forster; John Lawson; Dean Hargreaves; Andrew Willetts
Subject: RE: Manuka mast heights (Abacus ref 45508)

Ian,

We have discussed the changes to the mast height in the UK, to manufacture six masts of different heights is totally impractical at this stage of proceedings if we are to meet the programme target dates.

The mast structures are designed, drawn up, steel ordered and going in to production, the only outstanding items are on the headframe which are of a small nature and should be finalized this week as they go in to production next week.

Further more the man-rider needs to operate from ground level not from a raised plinth.

Best regards

For and on behalf of Abacus Lighting Ltd

Tony Staten | Abacus Lighting
Global Contracts Director

Oddicroft Lane, Sutton-in-Ashfield,
Nottinghamshire, NG17 5FT, United Kingdom
Tel: +44 1623 518 226 | Mob: +44 7973 908 510

www.abacuslighting.com | twitter.com/AbacusLighting
AStaten@AbacusLighting.com

Begin forwarded message:

From: Gordon Humphreys <ghumphreys@AbacusLighting.com>
Date: 20 August 2012 10:14:51 GMT+01:00
To: Ian Smith <Ian.Smith@cox.com.au>, Greg Sutton <gsutton@dialight.com.au>, Lee Dye <ldye@AbacusLighting.com>
Cc: Don Gilson <Don.Gilson@cox.com.au>, David Sloan <david.sloan@landdata.com.au>, Agnieszka Liso <Agnieszka.Liso@cox.com.au>, "Maginness, Ron" <Ron.Maginness@act.gov.au>, "Rod.Florence@act.gov.au" <Rod.Florence@act.gov.au>, Phillip Greenup <Phillip.Greenup@arup.com.au>, John Anthony <JAnthony@AbacusLighting.com>
Subject: RE: Footing Detail

Ian,

I agree with Greg that the baseplate should not be buried. To do so would cause too many inspection and maintenance issues.

To raise some of the masts up on to concrete plinths is acceptable from a structural point of view. The main issue is then accessing the base and, more critically, lifting the man-rider in to place. This is not necessarily insurmountable though so we will discuss this and see if it's a feasible approach.

To switch to using six different height masts is obviously undesirable from a production viewpoint and would have a significant effect on our programme, which is already extremely tight.

We are having a progress meeting here this morning so I will email later to tell you the plan of attack.

Gordon

For and on behalf of Abacus Lighting Ltd

Gordon Humphreys | Abacus Lighting
Mechanical Design Manager

Oddicroft Lane, Sutton-in-Ashfield,
Nottinghamshire, NG17 5FT, United Kingdom
Tel: +44 1623 518 230 | Mob: +44 7973 655 462

www.abacuslighting.com | twitter.com/AbacusLighting
ghumphreys@AbacusLighting.com

From: Ian Smith [mailto:Ian.Smith@cox.com.au]
Sent: 20 August 2012 09:35
To: Greg Sutton; Gordon Humphreys; Lee Dye
Cc: Don Gilson; David Sloan; Agnieszka Liso; Maginness, Ron; Rod.Florence@act.gov.au; Phillip Greenup
Subject: RE: Footing Detail

All,

I have looked at the existing ground RLs at the proposed position of each pole according to the revised survey. Assuming the base plate must be exposed as Greg suggests, and also assuming it is not acceptable to have a 3m high concrete plinth the pole heights will therefore need to vary to accommodate the fall of the ground.

Therefore the approximate pole/headframe heights could be derived as per the attached spreadsheet which assumes a 100mm tolerance on pole height to ensure we do not break the RL 617, and a 150mm high plinth at the base of the towers to ensure the base plate sits above FGL but will allow the manrider to be lifted onto the plinth without difficulty. Note there is a 2.85m difference in ground RL depending on pole location.

Gordon/Lee, could you please respond on the questions raised below and also on the general issue of how you are going to deal with the varying RLs to get a consistent pole height and workable plinth? A set of shop drawings of towers and footings will tell all. How are you going with these? They were due to be completed last week?

On a related matter I gather Affinity had LandData out on site today setting the poles out. As discussed at the first site meeting we are working on a setout drawing (we are also liaising with LandData to verify the global coordinate system from their survey to ensure accurate placement and this is taking longer than hoped), so I am not sure what Affinity are using for their setout? Can you advise Greg? We obviously need to get this right...

Regards,

IS.

Ian Smith - Director

<image001.gif>

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22 Jardine Street, Kingston ACT 2604 Australia
E: Ian.Smith@cox.com.au | T: +61 2 6239 6255 | M: +61 437 037 981 | W: coxarchitecture.com.au | Disclaimer

From: Greg Sutton [mailto:gsutton@dialight.com.au]
Sent: Monday, 20 August 2012 9:27 AM
To: Maginness, Ron; Ian Smith
Subject: RE: Footing Detail

Ron,
That's an important point, it also affects the access for the Man-rider unit and locations of the control cabinets. I spoke with the Abacus lighting designers and they have allowed some variation in the mast heights in their design so the slight difference in finished heights of the masts doesn't affect the lighting levels.
It really comes down to the man-rider access and the finished appearance.

Regards
Greg Sutton
0419 917 880

From: Maginness, Ron [mailto:Ron.Maginness@act.gov.au]
Sent: Monday, 20 August 2012 8:40 AM
To: Ian Smith; Greg Sutton
Subject: RE: Footing Detail

Ian/Greg,

I don't want to upset the applecart and I appreciate the need to get on with it as we can't afford any delays, but, you need to give some thought to the finished level of the base plate, particularly in those areas of existing and future hard paving. Is it worth considering standard length poles with variable height concrete plinths that stick up off the pile cap.

Cheers

Ron

Ron Maginness| Consultant Project Manager|
| phone: (02) 6207 9035| fax: (02) 6207 0123| mob: 0418 628 649
Economic Development Directorate | ACT Government |

Level 6, TransACT House, 470 Northbourne Avenue, Dickson ACT 2602, GPO Box 158 Canberra ACT 2601
www.economicdevelopment.act.gov.au

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From: Ian Smith [mailto:Ian.Smith@cox.com.au]
Sent: Friday, 17 August 2012 5:38 PM
To: Greg Sutton; Lee Dye; Gordon Humphreys
Cc: Richard Salter; Maginness, Ron
Subject: RE: Footing Detail

Yes correct – sorry I stated it in the negative.

IS.

Ian Smith - Director

<image001.gif>

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22 Jardine Street, Kingston ACT 2604 Australia
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From: Greg Sutton [mailto:gsutton@dialight.com.au]
Sent: Friday, 17 August 2012 5:35 PM
To: Ian Smith; Lee Dye; Gordon Humphreys

Cc: Richard Salter; Maginness, Ron
Subject: RE: Footing Detail

Ian,
Just to clarify point 2, in our discussion today my comment was that the base plate needs to be above the ground level not in the ground.

Regards
Greg Sutton
0419 917 880

From: Ian Smith [mailto:Ian.Smith@cox.com.au]
Sent: Friday, 17 August 2012 5:28 PM
To: Lee Dye; Gordon Humphreys
Cc: Greg Sutton; Richard Salter; Maginness, Ron
Subject: FW: Footing Detail

Hi Lee and Gordon,

I had a discussion with Greg today about plinth details – he was requesting guidance on what we wanted in terms of the shap of the concrete plinth visible above the ground under the base plat., but it triggered a more fundamental question about the pole heights and how you will address the varying RLs at the base of the poles.

Our documentation is based on all head frames being an equal height close to RL 617 so that each head frame has a similar relationship to the pitch and maximises it's allowable height to ensure the best possible geometry within the constraints of the planning controls.

1. We had assumed that you would want to make the towers a standard height, so have shown a base detail where the base pate is embedded under the ground surface – refer attached drawing. We had understood that you would design the towers so the position where the ground was lowest the base plate was just under the paving level, and at the higher elevations on the site the base plate would end up 1-2m under the surface.

2. However, Greg though that you would not want the base plate to be in the ground, and so would do the opposite and make the standard tower for the highest ground RL, and accept that at the lower end of the site the top of the head frame would be accordingly lower.

3. An obvious third alternative is to customise each tower to suit the relevant ground level at its position to achieve the constant RL 617 at the top, but I presume this is difficult to do.

I would think that, if the base plate can be embedded, the Option 1 will achieve a better result in terms of lighting design and presentation at the base of the towers. In addition I'm not sure that it would be acceptable for the tops of the towers to vary in height up to 2 m.

Can you liaise on what you had in mind?

Regards,

IS.

Ian Smith - Director

<image001.gif>

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---

From: Greg Sutton [mailto:gsutton@dialight.com.au]
Sent: Friday, 17 August 2012 3:14 PM
To: Ian Smith

Cc: Don Gilson
Subject: Footing Detail

Ian,
Please see the attached base plate drawing.

Regards

Greg Sutton
M 0419 917 880
P 1300 657 147
F 02 9679 2618
MDesSc(Illumination) Tech I.E.S
East Coast Business Development Manager &
Lighting Engineer
Dialight ILS Australia
www.dialight.com.au
<image002.png>

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****
Abacus Lighting Limited
Oddicroft Lane, Sutton in Ashfield, Nottinghamshire, UK, NG17 5FT
Company Registration Number: 612235
Telephone: +44 (0)1623 511 111 Fax: +44 (0)1623 552 133
www.abacuslighting.com

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****

Rea, Peter

From: Maginness, Ron
Sent: Tuesday, 21 August 2012 12:52 PM
To: McNulty, Hamish; Rea, Peter
Subject: FW: Manuka mast heights (Abacus ref 45508)
Attachments: 120820 Pole RLs.xlsx

Ron Maginness| Consultant Project Manager|

| phone: (02) 6207 9035| fax: (02) 6207 0123| mob: 0418 628 649

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Level 6, TransACT House, 470 Northbourne Avenue, Dickson ACT 2602, GPO Box 158 Canberra ACT 2601

www.economicdevelopment.act.gov.au

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Cc: John Anthony; 'gsutton@dialight.com.au'; Lee Dye; Don Gilson; 'david.sloan@landdata.com.au'; Agnieszka Liso; Maginness, Ron; Florence, Rod; 'Phillip.Greenup@arup.com.au'; Chris Welbourn; Gordon Humphreys; Steve Forster; John Lawson; Dean Hargreaves; Andrew Willetts; Don Gilson
Subject: RE: Manuka mast heights (Abacus ref 45508)

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IS.

Ian Smith - Director

COX

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From: Tony Staten [mailto:AStaten@AbacusLighting.com]
Sent: Monday, 20 August 2012 9:36 PM
To: Ian Smith
Cc: John Anthony; 'gsutton@dialight.com.au'; Lee Dye; Don Gilson; 'david.sloan@landdata.com.au'; Agnieszka Liso; 'Ron.Maginness@act.gov.au'; 'Rod.Florence@act.gov.au'; 'Phillip.Greenup@arup.com.au'; Chris Welbourn; Gordon Humphreys; Steve Forster; John Lawson; Dean Hargreaves; Andrew Willetts
Subject: RE: Manuka mast heights (Abacus ref 45508)

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Best regards

For and on behalf of Abacus Lighting Ltd

Tony Staten | Abacus Lighting
Global Contracts Director

Oddicroft Lane, Sutton-in-Ashfield,
Nottinghamshire, NG17 5FT, United Kingdom
Tel: +44 1623 518 226 | Mob: +44 7973 908 510

www.abacuslighting.com | twitter.com/AbacusLighting
AStaten@AbacusLighting.com

Begin forwarded message:

> **From:** Gordon Humphreys <ghumphreys@AbacusLighting.com>
> **Date:** 20 August 2012 10:14:51 GMT+01:00
> **To:** Ian Smith <Ian.Smith@cox.com.au>, Greg Sutton <gsutton@dialight.com.au>, Lee Dye <ldye@AbacusLighting.com>
> **Cc:** Don Gilson <Don.Gilson@cox.com.au>, David Sloan <david.sloan@landdata.com.au>, Agnieszka Liso <Agnieszka.Liso@cox.com.au>, "Maginness, Ron" <Ron.Maginness@act.gov.au>, "Rod.Florence@act.gov.au" <Rod.Florence@act.gov.au>, Phillip Greenup <Phillip.Greenup@arup.com.au>, John Anthony <JAnthony@AbacusLighting.com>
> **Subject: RE: Footing Detail**
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> We are having a progress meeting here this morning so I will email later to tell you the plan of attack.
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> Gordon

For and on behalf of Abacus Lighting Ltd

Gordon Humphreys | Abacus Lighting
Mechanical Design Manager

Oddicroft Lane, Sutton-in-Ashfield,
Nottinghamshire, NG17 5FT, United Kingdom
Tel: +44 1623 518 230 | Mob: +44 7973 655 462

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ghumphreys@AbacusLighting.com

From: Ian Smith [mailto:Ian.Smith@cox.com.au]
Sent: 20 August 2012 09:35
To: Greg Sutton; Gordon Humphreys; Lee Dye
Cc: Don Gilson; David Sloan; Agnieszka Liso; Maginness, Ron; Rod.Florence@act.gov.au; Phillip Greenup
Subject: RE: Footing Detail

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Regards,

IS.

Ian Smith - Director

<image001.gif>

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From: Greg Sutton [mailto:gsutton@dialight.com.au]
Sent: Monday, 20 August 2012 9:27 AM
To: Maginness, Ron; Ian Smith
Subject: RE: Footing Detail

Ron,
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It really comes down to the man-rider access and the finished appearance.

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0419 917 880

From: Maginness, Ron [mailto:Ron.Maginness@act.gov.au]
Sent: Monday, 20 August 2012 8:40 AM
To: Ian Smith; Greg Sutton
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Cheers

Ron

Ron Maginness| Consultant Project Manager|
| phone: (02) 6207 9035| fax: (02) 6207 0123| mob: 0418 628 649
Economic Development Directorate | ACT Government |

Level 6, TransACT House, 470 Northbourne Avenue, Dickson ACT 2602, GPO Box 158 Canberra ACT 2601
www.economicdevelopment.act.gov.au

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From: Ian Smith [mailto:Ian.Smith@cox.com.au]
Sent: Friday, 17 August 2012 5:38 PM
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Cc: Richard Salter; Maginness, Ron
Subject: RE: Footing Detail

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<image001.gif>

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Sent: Friday, 17 August 2012 3:14 PM
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Cc: Don Gilson
Subject: Footing Detail

Ian,
Please see the attached base plate drawing.

Regards

Greg Sutton
M 0419 917 880
P 1300 657 147
F 02 9679 2618
MDesSc(Illumination) Tech I.E.S
East Coast Business Development Manager &
Lighting Engineer
Dialight ILS Australia
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<image002.png>

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Oddicroft Lane, Sutton in Ashfield, Nottinghamshire, UK, NG17 5FT
Company Registration Number: 612235
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Manuka Oval - Pole Height Calcs

Pole Number	Max RL	Top Tolerance	Target Top RL	Nom. Ground RL	Plinth Height	Nominal Tower Height
T1	617.000	0.100	616.900	571.700	0.150	45.050
T2	617.000	0.100	616.900	570.700	0.150	46.050
T3	617.000	0.100	616.900	569.000	0.150	47.750
T4	617.000	0.100	616.900	568.850	0.150	47.900
T5	617.000	0.100	616.900	569.450	0.150	47.300
T6	617.000	0.100	616.900	570.700	0.150	46.050
			Difference	**2.850**		

Rea, Peter

From: Maginness, Ron
Sent: Tuesday, 21 August 2012 12:50 PM
To: Rea, Peter
Cc: McNulty, Hamish
Subject: FW: Footing Detail

FYI

Ron Maginness| Consultant Project Manager|

| phone: (02) 6207 9035| fax: (02) 6207 0123| mob: 0418 628 649

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From: Gordon Humphreys [mailto:ghumphreys@AbacusLighting.com]
Sent: Monday, 20 August 2012 7:15 PM
To: Ian Smith; Greg Sutton; Lee Dye
Cc: Don Gilson; David Sloan; Agnieszka Liso; Maginness, Ron; Florence, Rod; Phillip Greenup; John Anthony
Subject: RE: Footing Detail

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****

Rea, Peter

From: Ian Smith [Ian.Smith@cox.com.au]
Sent: Monday, 20 August 2012 7:02 PM
To: Gordon Humphreys; Greg Sutton
Cc: John Anthony; Lee Dye; Stuart Harper; Don Gilson; Maginness, Ron; Rea, Peter; Florence, Rod; Florence, Rod
Subject: RE: Manuka Lighting - Tower Access

Hi Gordon,

Rod Florence organised a meeting with his operations people this morning to agree a response to your query regarding fall arrest systems below.

The upshot of this was that they feel that a static line permanent system with associated running gear would be desirable for the move from the man rider up to the platform, and up the ladder to the top of the head frame (managing a twin lanyard system while moving up a ladder will be difficult) – preferably as one run if this can be achieved, but potentially you will need to break the line due to the hatch in the platform? A twin lanyard system for accessing the lateral catwalks from the central ladder will be fine.

Some other queries that arose in the discussion which I hope you can answer include:

1. How heavy is the man rider and how is it moved? Can it have forklift slots to aid moving long distances?
2. Does the manrider have safety switches to prevent it being winched up until it is properly affixed to the pole?
3. The documents call up training and operations manuals for the use of the manrider. Please confirm these will be provided.
4. Will the man rider be custom engineered for the inclined tower? That is, on the 7.5 degree incline we anticiapte that the floor will be horizontal.
5. Suggest a wind gauge is mounted on top of tower to ensure that poles are not accessed when it is too windy.
6. Please confirm specified reflective prism bird scarer will be installed on each tower.
7. How is the spotlight glass cleaned? Do the fitting pivot for ease of access?
8. Will the rollers mark the pole, especially if paint finished?
9. How are you going confirming the access system will comply with local standards and codes, including requirement for regular inspection (6 monthly or annually?).

Cheers,

IS.

Ian Smith - Director

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From: Gordon Humphreys [mailto:ghumphreys@AbacusLighting.com]
Sent: Thursday, 16 August 2012 1:42 AM
To: Ian Smith; Greg Sutton
Cc: John Anthony; Lee Dye; Stuart Harper; Don Gilson; Maginness, Ron; Peter Rea (Peter.Rea@act.gov.au); Rod.Florence@act.gov.au; Florence, Rod
Subject: RE: Manuka Lighting - Tower Access

Hi Ian,

I agree that the rail clamp looks cumbersome – this was a drawing from the personnel lift supplier and we made the same comment when we saw it. We'll probably work on the basis of bolting directly through the flange into the

shaft and could use countersunk bolts for this. The difficulty is that we can't bolt though the shaft in the overlap areas.

Having three ladders radiating up the headframe is less practical now that the headframe is wider at the top and the lights are more spread out. The required sideways reach from the ladder would be too great. I'm also not comfortable with a ladder which slopes sideways too much (although this isn't specifically precluded in the standards).

The fall arrest systems options are as follows;

- A permanently installed system whereby the operative has a sliding chuck device attached to their harness which is then attached to a stainless steel wire. Systems exist for both vertical ladders and horizontal runs. I don't know what systems are used in Australia but in the UK this is one example. The advantage is that on a long run of ladder or walkway the operative doesn't need to unclip and reclip to bypass brackets. The downside is that a stock of devices must be kept and the whole system must be inspected and maintained annually.
- The operative has two lanyards attached to their harness (generally via a shock absorber). On the end of each lanyard is a large clip which can be attached to any suitable anchorage point. This allows the operative to move around whilst keeping one lanyard attached at all times. This is a simple approach but on long ladders and traverses it can be awkward.

Personally, I would favour the lanyard approach. On short runs (say less than 20m) the advantages of a permanent fall arrest are lost and the simplicity of lanyards becomes preferable. Unless instructed otherwise we will work on this basis.

The catwalk proposal I think would be quite discreet. See attached sketchs showing the layout. The catwalk is around 200mm wide and is curved to follow the line of the horizontal. A handrail is provided on the underside of the horizontal above to hold on to and to attach a lanyard.

Regards,

Gordon

For and on behalf of Abacus Lighting Ltd

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Mechanical Design Manager

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From: Ian Smith [mailto:Ian.Smith@cox.com.au]
Sent: 15 August 2012 01:28
To: Gordon Humphreys; Greg Sutton
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Subject: RE: Manuka Lighting - Tower Access

Hi Gordon,

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Sent: Wednesday, 15 August 2012 1:29 AM
To: Ian Smith; Greg Sutton
Cc: John Anthony; Lee Dye; Stuart Harper; Don Gilson; Maginness, Ron; Peter Rea (Peter.Rea@act.gov.au); od.Florence@act.gov.au
Subject: RE: Manuka Lighting - Tower Access

Ian,

Thank you for the feedback. We'll look at how best to incorporate the banner brackets with the rail. The problem with welding the rail directly to the shaft as a T-section is that the shafts are nested together for shipping. Since shipping is a major cost we need to have the rail detachable. This isn't an insurmountable problem though and we'll work out a solution easily enough. Understood on the nesting of the tower segments. I still think we can improve on your detail by using a cut down universal column or similar and bolting directly without the clamp detail you were suggesting, and also thing about countersunk fixings rather than basic bolts. The elements clos tot he ground are the most critical in terms of how the tower present to the public.

We are looking at the access provision up the rear of the headframe. Can you advise what you envisaged the layout would be? We are working along the lines of having a central ladder going up the full height with narrow catwalks behind each horizontal for traversing out to each fitting. Ideally an operative needs to be able access each fitting and have both hands free for working. Should we use a fixed fall arrest system or assume the use of double lanyards? We had drawn a single ladder, but would prefer to not see gantries across the back of the head frame if we can avoid it. The triple ladder arrangement fanning out from the access platform you had shown in your tender drawings looks like a pretty good solution to us because it would minimise the structure on the head frame but provide ready access to each fitting? If this is not compliant with access codes, how wide would the catwalks be, and would they have handrails etc.? I don't know the difference between a fixed fall arrest system and double lanyards so can't comment on that aspect sorry. Roof access systems her tend to have a fixed cable that a worker can hook into with a harness if that helps. Rod, do you or your team have a view?

Regards,

Gordon

For and on behalf of Abacus Lighting Ltd

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Hi Gordon,

See below comments in red and attached sketches. I hope these suggestions are clear and achievable, but please call if you have any queries.

Note any future RFIs need to now formally go through Don Gilson as the Contract Superintendent, but you can Cc me in directly to ensure the quickest possible turnaround.

Cheers,

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From: Gordon Humphreys [mailto:ghumphreys@AbacusLighting.com]
Sent: Tuesday, 14 August 2012 1:35 AM
To: Greg Sutton; Ian Smith
Cc: John Anthony; Lee Dye
Subject: FW: Manuka Lighting - Tower Access

Greg / Ian,

Thank you for confirming the access method on the masts. There are a few issues with using the lift system listed below which I would appreciate your comment on.

Many thanks,

Gordon

For and on behalf of Abacus Lighting Ltd

Gordon Humphreys | Abacus Lighting
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From: Lee Dye
Sent: 13 August 2012 13:12
To: Gordon Humphreys
Subject: RE: Manuka Lighting - Tower Access

Gordon,

List of points for comment by Cox/Dialight:

- The two winch cables for the personnel lift on a sloped mast have to be permanently under tension on the outside of the mast. This means there will be cable within reach of the public that could be open to vandalism/misuse. An option would be to suspend the cable higher up the mast, then use a ladder to release it for the lift operation. Please confirm your preference on how to manage this. Cables should be terminated out of reach at about 3.5m above ground with ladder used to access. Suggest cables run in man-rider guide rail with termination points clearing rollers as per attached sketch to conceal and reduce movement from wind. Refer to attached alternate guide rail details.
- The lift effectively "hugs" the mast as it ascends, meaning any banners would have to be removed prior to operation. It would also mean that because the guide rail for the lift is mounted centrally to the rear of the mast, any banners would have to mounted offset from the centre. Please define locations for the banner pole fixing positions (height from GL, distance apart, orientation relative to CL of mast, etc.). Understood how the carriage works. Attached sketches show how two banner poles might be fixed into guide rail without impeding rider, and so rider could be used to access banner to install and remove. Requires a heavy gauge web to track to allow tapping into it without creating obstructions, or if the rider rollers are spring loaded, they could roll over a threaded tube inserted in the web to avoid the whole thing being heavy gauge. Attached sketches show desired position and size – one each per pole.
- There will have to be a small ladder (approx 2m in length) that negotiates the knuckle joint up to the platform, as this will be inaccessible for the personnel lift. Due to the fall-arrest cable, the ladder cannot be curved to follow the knuckle profile, although we will endeavour to make it as inconspicuous as possible. I do not fully understand why cable affects ladder, but we look forward to seeing shop drawings which I gather you are targeting completing end of this week so we can review and comment if required.
- The guide rail for the lift cannot be made in one piece, and as such will be supplied in separate lengths of approx 6m and bolted to the shaft. Due to the nature of the overlap slip joints, there will have to be gaps in the rail to allow for settlement once the mast has been installed upright. Shafts tend to settle by up to 50mm once installed, so there would have to be design gaps in the rail to allow for this. It may have ramifications on the overall visual impact of the mast. Understood on the need to leave room for settlement. Can the guide rail also have a slip joint so it reads continuous from the ground? Your proposed fixing detail looks pretty agricultural. See attached suggested alternate details for track, including welding the track to pole, or at least using a cut down universal column so that you avoid the suggested cleat and bolt detail, eliminating the cleat.

Regards,

For and on behalf of Abacus Lighting Ltd

Lee Dye | Abacus Lighting
Project Engineer

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From: John Anthony
Sent: 12 August 2012 03:57
To: Ian Smith; Lee Dye; Gordon Humphreys; Neil McClymont
Cc: Ron.Maginness@act.gov.au; Greg Sutton; Florence, Rod; Rea, Peter; Tony Staten; Chris Welbourn
Subject: RE: Manuka Lighting - Tower Access

Thanks Ian,

We confirm that the man rider will be the means of head frame access. Gordon will prepare the detailed drawings for this and submit.
Hope to meet you on Monday or Tuesday this week during my visit to Canberra with Greg Sutton of ILS and Abacus Contracts Director Tony Staten. John

For and on behalf of Abacus Lighting

John Anthony | Abacus Lighting
Export Sales Director

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From: Ian Smith [mailto:Ian.Smith@cox.com.au]
Sent: 12 August 2012 03:23
To: John Anthony; Lee Dye; Gordon Humphreys; Neil McClymont
Cc: Ron.Maginness@act.gov.au; Greg Sutton; Florence, Rod; Rea, Peter
Subject: Manuka Lighting - Tower Access

Dear John,

I am confirming on TVE and SSP's behalf that the man-rider is to be the access approach adopted at Manuka. Please confirm,

Cheers,

IS.

Ian Smith - Director

COX

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