MILNE PORT POWER DISTRIBUTION: 5kV 3/C CABLE SCHEDULE

ITEM NO.	FEEDER TAG NO.	ORIGIN BUILDING TAG NO.	ORIGIN BUILDING DESCRIPTION	ORIGIN EQUIPMENT TAG NO.	DESTINATION BUILDING TAG NO.	DESTINATION BUILDING DESCRIPTION	DESTINATION EQUIPMENT TAG	FEEDER CABLE DESCRIPTION	ESTIMATED LENGTH (M)	SUPPLIED LENGTH (M)	QTY. TERM./ SPLICES	SUPPLY (YEAR)	INSTALL YEAR
1	F4	2530-BLD-009	POWER GENERATION E-HOUSE #1	2530-SWG-001	2432-BLD-001	SHIPLOADING E-HOUSE	2432-LBS-001A	2 X 5kV HVTECK 3/C 350MCM CU	2 X 1000	2,100	4/2	BE001 (2013/14)	2014
2	F5	2530-BLD-009	POWER GENERATION E-HOUSE #1	2530-SWG-001	2750-BLD-003	SERVICES AREA E-HOUSE #1	2750-LBS-003	1 X 5kV HVTECK 3/C 350MCM CU	400	750	2/0	BE001 (2013)	2013
3	F6	2530-BLD-009	POWER GENERATION E-HOUSE #1	2530-SWG-001	2750-BLD-004	SERVICES AREA E-HOUSE #2	2750-LBS-004	1 X 5kV HVTECK 3/C 350MCM CU	335	750	2/0	BE001 (2013)	2013
4	F6'	2750-BLD-004	SERVICES AREA E-HOUSE #2	2750-LBS-004	2750-BLD-001	ACCOMODATION AREA E-HOUSE #1	2750-LBS-001A	1 X 5kV HVTECK 3/C 350MCM CU	455	750	2/0	BE001 (2013)	2013
5	F9	2530-BLD-010	POWER GENERATION E-HOUSE #2	2530-SWG-002	2750-BLD-002	ACCOMODATION AREA E-HOUSE #2	2750-LBS-002	1 X 5kV HVTECK 3/C 350MCM CU	560	750	2/0	BE001 (2013)	2013
6	F9'	2750-BLD-002	ACCOMODATION AREA E-HOUSE #2	2750-LBS-002	2750-BLD-001	ACCOMODATION AREA E-HOUSE #1	2750-LBS-001B	1 X 5kV HVTECK 3/C 350MCM CU	191	300	2/0	BE001 (2013)	2013
7	F10	2530-BLD-010	POWER GENERATION E-HOUSE #2	2530-SWG-002	2750-BLD-005	FUEL TANK FARM E-HOUSE	2750-LBS-005	2 X 5kV HVTECK 3/C 350MCM CU	2 X 118	750	2/0	BE001 (2013)	2013
8	F10'	2750-BLD-005	FUEL TANK FARM E-HOUSE	2750-LBS-005	2432-BLD-001	SHIPLOADING E-HOUSE	2432-LBS-001B	2 X 5kV HVTECK 3/C 350MCM CU	2 X 932	2,100	4/2	BE001 (2013/14)	2014

PERMIT TO PRACTICE
HATCH LTD.
Signature BKP
Date 2013-09-05
PERMIT NUMBER: P 512
The Association of Professional Engineers, Geologists and Geophysicists of NWT/NU

FOR CONSTRUCTION

REGISTERED PROFESSIONAL ENGINEER
B.K. PERKINS
LICENSEE
L1307 05
NT/NU

NOTES:

1. FEEDER AND EQUIPMENT TAG NO.'S ARE AS PER PROJECT POWER GENERATION AND DISTRIBUTION SLD'S.
2. BUILDING TAG NO.'S AND DESCRIPTIONS ARE AS PER H349000-1000-00-144-0001, MASTER BUILDING MATRIX.
3. ESTIMATED LENGTHS BASED ON H349000-2000-00-014-0005, MILNE PORT UTILITY SERVICES SITE LAYOUT.
4. SUPPLIED LENGTHS BASED ON STANDARD CABLE REEL CAPACITIES WITH A MINIMUM OF ONE (1) REEL PER FEEDER.
5. QTY. TERM./SPLICES DENOTES REQUISITE NUMBER OF TERMINATIONS AND SPLICE KITS.
6. FIELD VERIFY FEEDER CABLE LENGTHS PRIOR TO CUTTING CABLE FROM REEL.

NO	DESCRIPTION	BY	CHK'D	APP'D	DATE

REVISIONS

NO	ISSUE FOR	AUTH. BY	DATE
0	CONSTRUCTION	BP JC	2013-09-05

ISSUE AUTHORIZATION

DESIGNED BY A. HUSSAINI DATE 2013-04-30
CHECKED BY M. JAGANI MJ. DATE 2013-09-03
PROJ. ENGR. C. CHELAND DATE 2013-09-05
PROJ. MGR. S. PERRY DATE 2013-09-05

HATCH

DRAWN BY J. SAINI DATE 2013-04-30
DISCIP. ENGR. B. PERKINS BKP DATE 2013-09-05
SCALE NTS OR AS NOTED

Baffinland
MARY RIVER PROJECT

MILNE PORT
POWER DISTRIBUTION
5KV 3/C CABLE SCHEDULE

DRAWING NO. H349000-2750-70-007-0001
REV. 0

ORIGINAL SHEET SIZE: A3 (420 X 297)

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MILNE PORT POWER DISTRIBUTION: 1kV 3/C CABLE SCHEDULE

ITEM NO.	FEEDER TAG NO.	ORIGIN BUILDING TAG NO.	ORIGIN BUILDING DESCRIPTION	ORIGIN EQUIPMENT TAG NO.	DESTINATION TAG NO.	DESTINATION DESCRIPTION	DESTINATION EQUIPMENT TAG NO.	FEEDER CABLE DESCRIPTION	ESTIMATED LENGTH (M)	SUPPLIED LENGTH (M)	SUPPLY (YEAR)	INSTALL YEAR
1	2511-DSW-004A-P	2750-BLD-001	ACCOMMODATION AREA E-HOUSE #1	2750-SWG-001	2511-BLD-001	KITCHEN (PANEL E)	2511-DSW-004A	1 X 1kV TECK90 4/C 1/0 AWG CU /1	86	129	BE001 (2013)	2013
2	2750-PNB-002-P	2750-BLD-001	ACCOMMODATION AREA E-HOUSE #1	2750-SWG-001	2750-BLD-002	ACCOMMODATION AREA E-HOUSE #2	2750-PNB-002	2 X 1kV TECK90 3/C 350MCM CU	2 X 173	2 X 259	BE001 (2013)	2013
3	2511-DSW-001A-P	2750-BLD-001	ACCOMMODATION AREA E-HOUSE #1	2750-SWG-001	2511-BLD-001	KITCHEN	2511-DSW-001A	1 X 1kV TECK90 3/C 350MCM CU	101	152	BE001 (2013)	2013
4	2511-DSW-002A-P	2750-BLD-001	ACCOMMODATION AREA E-HOUSE #1	2750-SWG-001	2511-BLD-001	RECREATION	2511-DSW-002A	1 X 1kV TECK90 3/C 350MCM CU	134	202	BE001 (2013)	2013
5	2511-DSW-003A-P	2750-BLD-001	ACCOMMODATION AREA E-HOUSE #1	2750-SWG-001	2511-BLD-003	LAUNDRY	2511-DSW-003A	1 X 1kV TECK90 3/C 350MCM CU	56	84	BE001 (2013)	2013
6	2511-DSW-005A-P	2750-BLD-001	ACCOMMODATION AREA E-HOUSE #1	2750-SWG-001	N/A	ARCTIC WALKWAY	2511-DSW-005A	1 X 1kV TECK90 3/C 350MCM CU	134	202	BE001 (2013)	2013
7	2512-DSW-004A-P	2750-BLD-002	ACCOMMODATION AREA E-HOUSE #2	2750-PNB-002	2512-BLD-004	DORM D	2512-DSW-004A	1 X 1kV TECK90 4/C 1/0 AWG CU /1	102	154	BE001 (2013)	2013
8	2512-DSW-003A-P	2750-BLD-002	ACCOMMODATION AREA E-HOUSE #2	2750-PNB-002	2512-BLD-003	DORM C	2512-DSW-003A	1 X 1kV TECK90 4/C 1/0 AWG CU	110	165	BE001 (2013)	2013
9	2512-DSW-002A-P	2750-BLD-002	ACCOMMODATION AREA E-HOUSE #2	2750-PNB-002	2512-BLD-002	DORM B	2512-DSW-002A	1 X 1kV TECK90 4/C 1/0 AWG CU	78	117	BE001 (2013)	2013
10	2512-DSW-001A-P	2750-BLD-002	ACCOMMODATION AREA E-HOUSE #2	2750-PNB-002	2512-BLD-001	DORM A	2512-DSW-001A	1 X 1kV TECK90 4/C 1/0 AWG CU	86	129	BE001 (2013)	2013
11	2513-PNB-002-P	2750-BLD-002	ACCOMMODATION AREA E-HOUSE #2	2750-PNB-002	2513-BLD-002	EMERG. RESPONSE GARAGE	2513-PNB-002	1 X 1kV TECK90 3/C 350MCM CU	178	267	BE001 (2013)	2013
12	7235-SPL-003-P	2750-BLD-003	SERVICE AREA E-HOUSE #1	2750-SWG-003	7235-BLD-003	UNHEATED WAREHOUSE	7235-SPL-003	1 X 1kV TECK90 3/C 350MCM CU	105	157	BE001 (2013)	2013
13	2521-PNB-002-P	2750-BLD-003	SERVICE AREA E-HOUSE #1	2750-SWG-003	2521-BLD-002	WELDING SHOP	2521-PNB-002	1 X 1kV TECK90 3/C 350MCM CU	133	200	BE001 (2013)	2013
14	2521-PNB-001-P	2750-BLD-003	SERVICE AREA E-HOUSE #1	2750-SWG-003	2521-BLD-001	MAINTENANCE BUILDING	2521-PNB-001	1 X 1kV TECK90 3/C 350MCM CU	106	159	BE001 (2013)	2013

PERMIT TO PRACTICE
HATCH LTD.
Signature BKP
Date 2013-11-05
PERMIT NUMBER: P 512
The Association of Professional Engineers, Geologists and Geophysicists of NWT/NU

REGISTERED PROFESSIONAL ENGINEER
B.K. PERKINS
LICENSEE
2013-11-05
NT/NU

FOR CONSTRUCTION

NOTES:

1. EQUIPMENT TAG NO.'S ARE AS PER PROJECT POWER GENERATION AND DISTRIBUTION SLD'S.
2. BUILDING TAG NO.'S AND DESCRIPTIONS ARE AS PER H349000-1000-00-144-0001, MASTER BUILDING MATRIX.
3. ESTIMATED LENGTHS BASED ON H349000-2000-00-014-0004, MILNE PORT INFRASTRUCTURE SITE LAYOUT.
4. SUPPLIED LENGTHS BASED ON 50% CONTINGENCY.
5. FIELD VERIFY FEEDER LENGTHS PRIOR TO CUTTING CABLE FROM REEL.
1 6. FOR 4/C CABLES, THE FOURTH CONDUCTOR IS NOT USED.

NO	DESCRIPTION	BY	CHK'D	APP'D	DATE
1	FIELD CHANGES	MJ	RS	BP	2013-11-06

REVISIONS

NO	ISSUE FOR	AUTH. BY	DATE
1	CONSTRUCTION	BP	2013-11-06
0	CONSTRUCTION	BP	2013-08-28

ISSUE AUTHORIZATION

DESIGNED BY A. HUSSAINI DATE 2013-05-01
CHECKED BY M. JAGANI DATE 2013-08-27
PROJ. ENGR. J. CLELAND DATE 2013-08-28
PROJ. MGR. S. PERRY DATE 2013-08-28

HATCH
DRAWN BY J. SAINI DATE 2013-05-01
DISCIP. ENGR. B. PERKINS DATE 2013-08-28
SCALE NTS OR AS NOTED

Baffinland
MARY RIVER PROJECT

MILNE PORT
POWER DISTRIBUTION
1KV 3/C CABLE SCHEDULE (SHT. 1 OF 2)

DRAWING NO. H349000-2750-70-007-0002-001
REV. 1

ORIGINAL SHEET SIZE: A3 (420 X 297)

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MILNE PORT POWER DISTRIBUTION: 1kV 3/C CABLE SCHEDULE (CONT.)

ITEM NO.	FEEDER TAG NO.	ORIGIN BUILDING TAG NO.	ORIGIN BUILDING DESCRIPTION	ORIGIN EQUIPMENT TAG NO.	DESTINATION TAG NO.	DESTINATION DESCRIPTION	DESTINATION EQUIPMENT TAG NO.	FEEDER CABLE DESCRIPTION	ESTIMATED LENGTH (M)	SUPPLIED LENGTH (M)	SUPPLY (YEAR)	INSTALL YEAR
15	7235-SPL-002-P	2750-BLD-003	SERVICE AREA E-HOUSE #1	2750-SWG-003	7235-BLD-002	HEATED WAREHOUSE	7235-SPL-002	1 X 1kV TECK90 3/C 350MCM CU	105	157	BE001 (2013)	2013
16	2731-CPL-005C-P	2750-BLD-004	SERVICE AREA E-HOUSE #2	2750-PNB-004	2731-VP-005	SEWAGE TREATMENT PLANT	2731-CPL-005C	1 X 1kV TECK90 3/C 350MCM CU	33	50	BE001 (2013)	2013
17	2540-PNB-001-P	2750-BLD-004	SERVICE AREA E-HOUSE #2	2750-PNB-004	2540-BLD-001	WASTE MNGMT. BUILDING	2540-PNB-001	1 X 1kV TECK90 3/C 350MCM CU	33	50	BE001 (2013)	2013
18	2732-PNB-001-P	2750-BLD-004	SERVICE AREA E-HOUSE #2	2750-PNB-004	2732-BLD-001	SEWAGE TRUCK BUILDING	2732-PNB-001	1 X 1kV TECK90 3/C 350MCM CU	42	63	BE001 (2013)	2013
19	2720-PNB-001-P	2750-BLD-004	SERVICE AREA E-HOUSE #2	2750-PNB-004	2720-BLD-001	WATER BUILDING	2720-PNB-001	1 X 1kV TECK90 3/C 350MCM CU	79	119	BE001 (2013)	2013
20	2613-MCB-013B-P	2750-BLD-005	FUEL TANK FARM E-HOUSE	2750-PNB-005	2613-FD-013	EXISTING FUEL DISPENSING MODULE	2613-MCB-013B	1 X 1kV TECK90 3/C 350MCM CU	305	457	BE001 (2013)	2013
21	2614-MCB-011B-P	2750-BLD-005	FUEL TANK FARM E-HOUSE	2750-PNB-005	2614-FD-011	JET-A1 FUEL DISPENSING MODULE	2614-MCB-011B	1 X 1kV TECK90 3/C 350MCM CU	330	495	BE001 (2013)	2013
22	2613-MCB-014B-P	2750-BLD-005	FUEL TANK FARM E-HOUSE	2750-PNB-005	2613-FD-014	DIESEL FUEL DISPENSING MODULE	2613-MCB-014B	1 X 1kV TECK90 3/C 350MCM CU	192	288	BE001 (2013)	2013

HOLD
H0001

HOLD
H0001

PERMIT TO PRACTICE
HATCH LTD.
Signature BKP
Date 2013-08-28
PERMIT NUMBER: P 512
The Association of Professional Engineers, Geologists and Geophysicists of NWT/NU

FOR CONSTRUCTION

REGISTERED PROFESSIONAL ENGINEER
B.K. PERKINS
LICENSEE
2013-08-28
NT/NU

HOLDS:

H0001. HOLD FOR FUEL DISPENSING MODULE ELECTRICAL DETAILS.

NO	DESCRIPTION	BY	CHK'D	APP'D	DATE
0	CONSTRUCTION	BP	JC		2013-08-28

REVISIONS

NO	ISSUE FOR	AUTH. BY	DATE
0	CONSTRUCTION	BP	2013-08-28

ISSUE AUTHORIZATION

DESIGNED BY A. HUSSAINI DATE 2013-05-01
CHECKED BY M. JAGANI MJ. DATE 2013-08-27
PROJ. ENGR. J. CLELAND DATE 2013-08-28
PROJ. MGR. S. PERRY DATE 2013-08-28

HATCH
DRAWN BY J. SAINI DATE 2013-05-01
DISCIP. ENGR. B. PERKINS BKP DATE 2013-08-28
SCALE NTS OR AS NOTED

Baffinland
MARY RIVER PROJECT

MILNE PORT
POWER DISTRIBUTION
1KV 3/C CABLE SCHEDULE (SHT. 2 OF 2)

DRAWING NO. H349000-2750-70-007-0002-002
REV. 0

ORIGINAL SHEET SIZE: A3 (420 X 297)

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28/08/2013 1:43:49 PM
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MILNE PORT POWER DISTRIBUTION: 1kV 4/C CABLE SCHEDULE

ITEM NO.	FEEDER TAG NO.	ORIGIN BUILDING TAG NO.	ORIGIN BUILDING DESCRIPTION	ORIGIN EQUIPMENT TAG NO.	DESTINATION TAG NO.	DESTINATION DESCRIPTION	DESTINATION EQUIPMENT TAG NO.	FEEDER CABLE DESCRIPTION	ESTIMATED LENGTH (M)	SUPPLIED LENGTH (M)	SUPPLY (YEAR)	INSTALL YEAR
1	2140-MPC-004A-P	2513-BLD-002	EMERGENCY RESPONSE GARAGE	2513-PNL-002B	N/A	READY LINE 4	2140-MPC-004A	1 X 1kV TECK90 4/C 1/0 AWG CU	59	88	BE001 (2013)	2013
2	2140-MPC-005A-P	2513-BLD-002	EMERGENCY RESPONSE GARAGE	2513-PNL-002B	N/A	READY LINE 5	2140-MPC-005A	1 X 1kV TECK90 4/C 1/0 AWG CU	59	88	BE001 (2013)	2013
3	2140-TRF-001D-P	2513-BLD-002	EMERGENCY RESPONSE GARAGE	2513-PNL-002B	N/A	READY LINE 1	2140-TRF-001D	1 X 1kV TECK90 4/C 1/0 AWG CU	219	328	BE001 (2013)	2013
4	2140-TRF-002D-P	2513-BLD-002	EMERGENCY RESPONSE GARAGE	2513-PNL-002B	N/A	READY LINE 2	2140-TRF-002D	1 X 1kV TECK90 4/C 1/0 AWG CU	244	366	BE001 (2013)	2013
5	2513-PNL-001A-P	2513-BLD-002	EMERGENCY RESPONSE GARAGE	2513-PNL-002A	2513-BLD-001	EMERGENCY RESPONSE OFFICE	2513-PNL-001A	1 X 1kV TECK90 4/C 1/0 AWG CU	38	56	BE001 (2013)	2013
6	2140-MPC-006A-P	2521-BLD-002	WELDING SHOP	2521-PNL-002B	2521-BLD-002	READY LINE 6	2140-MPC-006A	1 X 1kV TECK90 4/C 1/0 AWG CU	66	99	BE001 (2013)	2013
7	2140-MPC-008A-P	2521-BLD-001	MAINTENANCE BUILDING	2521-PNL-001B	N/A	READY LINE 8	2140-MPC-008A	1 X 1kV TECK90 4/C 1/0 AWG CU	96	144	BE001 (2013)	2013
8	2521-PNL-004A-P	2521-BLD-001	MAINTENANCE BUILDING	2521-PNL-001A	2521-BLD-004	WORKSHOP OFFICE WASHCAR	2521-PNL-004A	1 X 1kV TECK90 4/C 1/0 AWG CU	61	92	BE001 (2013)	2013
9	2521-PNL-003A-P	2521-BLD-001	MAINTENANCE BUILDING	2521-PNL-001A	2521-BLD-003	WORKSHOP OFFICE	2521-PNL-003A	1 X 1kV TECK90 4/C 1/0 AWG CU	58	86	BE001 (2013)	2013
10	2540-CPL-001B-P	2540-BLD-001	WASTE MNGMT. BUILDING	2540-PNL-001B	2540-VP-001	WASTE INCINERATOR	2540-CPL-001B	1 X 1kV TECK90 4/C 1/0 AWG CU	108	161	BE001 (2013)	2013
11	2734-CPL-001C-P	2750-BLD-004	SERVICES AREA E-HOUSE #2	2750-PNB-004	2731-VP-005	TREATED EFFLUENT HEAT TRACING PNL. (INSIDE STP)	2734-CPL-001C	1 X 1kV TECK90 4/C 1/0 AWG CU	33	50	BE001 (2013)	2013
12	2731-CPL-001B-P	2732-BLD-001	SEWAGE TRUCK BUILDING	2732-PNL-001B	2731-BLD-001	SEWAGE CHEMICAL STORAGE CONTAINER	2731-CPL-001B	1 X 1kV TECK90 4/C 1/0 AWG CU	100	150	BE001 (2013)	2013

PERMIT TO PRACTICE
HATCH LTD.
Signature BKP
Date 2013-09-05
PERMIT NUMBER: P 512
The Association of Professional Engineers, Geologists and Geophysicists of NWT/NU

FOR CONSTRUCTION

REGISTERED PROFESSIONAL ENGINEER
B.K. PERKINS
LICENSEE
2013-09-05
NT/NU

NOTES:

1. FEEDER AND EQUIPMENT TAG NO.'S ARE AS PER PROJECT POWER GENERATION AND DISTRIBUTION SLD'S.
2. BUILDING TAG NO.'S AND DESCRIPTIONS ARE AS PER H349000-1000-00-144-0001, MASTER BUILDING MATRIX.
3. ESTIMATED LENGTHS BASED ON H349000-2000-00-014-0004, MILNE PORT INFRASTRUCTURE SITE LAYOUT.
4. SUPPLIED LENGTHS BASED ON 50% CONTINGENCY.
5. FIELD VERIFY FEEDER LENGTHS PRIOR TO CUTTING CABLE FROM REEL.

NO	DESCRIPTION	BY	CHK'D	APP'D	DATE

REVISIONS

NO	ISSUE FOR	AUTH. BY		DATE
0	CONSTRUCTION	BP	JC	2013-09-05

ISSUE AUTHORIZATION

DESIGNED BY A. HUSSAINI DATE 2013-05-03
CHECKED BY M. JAGANI MJ. DATE 2013-09-04
PROJ. ENGR. J. CLELAND DATE 2013-09-05
PROJ. MGR. S. PETRY DATE 2013-09-05

HATCH

DRAWN BY J. SAINI DATE 2013-05-03
DISCIP. ENGR. B. PERKINS BKP DATE 2013-09-05
SCALE NTS OR AS NOTED

Baffinland

MARY RIVER PROJECT

MILNE PORT
POWER DISTRIBUTION
1KV 4/C CABLE SCHEDULE

DRAWING NO. H349000-2750-70-007-0003
REV. 0

ORIGINAL SHEET SIZE: A3 (420 X 297)

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MINE SITE POWER DISTRIBUTION: 5kV 3/C CABLE SCHEDULE

ITEM NO.	FEEDER TAG NO.	ORIGIN BUILDING TAG NO.	ORIGIN BUILDING DESCRIPTION	ORIGIN EQUIPMENT TAG NO.	DESTINATION BUILDING TAG NO.	DESTINATION BUILDING DESCRIPTION	DESTINATION EQUIPMENT TAG NO.	FEEDER CABLE DESCRIPTION	ESTIMATED LENGTH (M)	SUPPLIED LENGTH (M)	QTY. TERM./ SPLICES	SUPPLY (YEAR)	INSTALL YEAR
1	F4	4530-BLD-007	POWER GENERATION E-HOUSE #1	4530-SWG-001	4750-BLD-005	FUEL TANK FARM E-HOUSE	4750-LBS-005	1 X 5kV HVTECK 3/C 350MCM CU	94	300	2/0	BE001 (2013)	2013
2	F4'	4750-BLD-005	FUEL TANK FARM E-HOUSE	4750-LBS-005	4750-BLD-008	CRUSHING & SCREENING E-HOUSE	4750-LBS-008A	1 X 5kV HVTECK 3/C 350MCM CU	1,092	1,350	2/2	BE001 (2013)	2014
3	F5	4530-BLD-007	POWER GENERATION E-HOUSE #1	4530-SWG-001	4750-BLD-003	SERVICES AREA E-HOUSE #1	4750-LBS-003	1 X 5kV HVTECK 3/C 350MCM CU	794	1,050	2/1	BE001 (2013)	2013
4	F5'	4750-BLD-003	SERVICES AREA E-HOUSE #1	4750-LBS-003	4750-BLD-004	SERVICES AREA E-HOUSE #2	4750-LBS-004	1 X 5kV HVTECK 3/C 350MCM CU	222	300	2/0	BE001 (2013)	2013
5	F6	4530-BLD-007	POWER GENERATION E-HOUSE #1	4530-SWG-001	4750-BLD-001	ACCOMMODATION AREA E-HOUSE #1	4750-LBS-001A	1 X 5kV HVTECK 3/C 350MCM CU	298	300	2/0	BE001 (2013)	2013
6	F9	4530-BLD-008	POWER GENERATION E-HOUSE #2	4530-SWG-002	4750-BLD-001	ACCOMMODATION AREA E-HOUSE #1	4750-LBS-001B	1 X 5kV HVTECK 3/C 350MCM CU	318	750	2/0	BE001 (2013)	2013
7	F9'	4750-BLD-001	ACCOMMODATION AREA E-HOUSE #1	4750-LBS-001B	4750-BLD-002	ACCOMMODATION AREA E-HOUSE #2	4750-LBS-002	1 X 5kV HVTECK 3/C 350MCM CU	216	300	2/0	BE001 (2013)	2013
8	F10	4530-BLD-008	POWER GENERATION E-HOUSE #2	4530-SWG-002	4750-BLD-008	CRUSHING & SCREENING E-HOUSE	4750-LBS-008B	1 X 5kV HVTECK 3/C 350MCM CU	1,118	1,500	2/1	BE001 (2013)	2014
9	F11	4530-BLD-008	POWER GENERATION E-HOUSE #2	4530-SWG-002	4750-BLD-006	AERODROME AREA E-HOUSE	4750-LBS-006	1 X 5kV HVTECK 3/C 350MCM CU	2,900	3,000	2/3	BE001 (2013)	2013
10	F11'	4750-BLD-006	AERODROME AREA E-HOUSE	4750-LBS-006	4750-BLD-007	RAW WATER SUPPLY E-HOUSE	4750-LBS-007	1 X 5kV HVTECK 3/C 350MCM CU	3,860	4,050	2/5	BE001 (2013)	2013

NOTES:

1. FEEDER AND EQUIPMENT TAG NO.'S ARE AS PER PROJECT POWER GENERATION AND DISTRIBUTION SLD'S.
2. BUILDING TAG NO.'S AND DESCRIPTIONS ARE AS PER H349000-1000-00-144-0001, MASTER BUILDING MATRIX.
3. ESTIMATED LENGTHS BASED ON H349000-4000-00-014-0004, MINE SITE UTILITY SERVICES SITE LAYOUT.
4. SUPPLIED LENGTHS BASED ON STANDARD CABLE REEL CAPACITIES WITH A MINIMUM OF ONE (1) REEL PER FEEDER.
5. QTY. TERM./SPLICES DENOTES REQUISITE NUMBER OF TERMINATIONS AND SPLICE KITS.
6. FIELD VERIFY FEEDER CABLE LENGTHS PRIOR TO CUTTING CABLE FROM REEL.

PERMIT TO PRACTICE
HATCH LTD.
Signature BKP
Date 2013-09-12
PERMIT NUMBER: P 512
The Association of Professional Engineers, Geologists and Geophysicists of NWT/NU

FOR CONSTRUCTION

REGISTERED PROFESSIONAL ENGINEER
B.K. PERKINS
LICENSEE
2013-09-12
NT/NU

NO	DESCRIPTION	BY	CHK'D	APP'D	DATE
REVISIONS					

NO	ISSUE FOR	AUTH. BY	DATE
0	CONSTRUCTION	BP	JC	2013-09-11
ISSUE AUTHORIZATION			

DESIGNED BY A. HUSSAINI DATE 2013-04-30
CHECKED BY M. JAGANI M.J. DATE 2013-09-11
PROJ. ENGR. J. CLELAND DATE 2013-09-11
PROJ. MGR. S. PERRY DATE 2013-09-11

HATCH

DRAWN BY J. SAINI DATE 2013-04-30
DISCIP. ENGR. B. PERKINS BKP DATE 2013-09-11
SCALE NTS OR AS NOTED

Baffinland

MARY RIVER PROJECT

MINE SITE
POWER DISTRIBUTION
5KV 3/C CABLE SCHEDULE

DRAWING NO. H349000-4750-70-007-0001
REV. 0

ORIGINAL SHEET SIZE: A3 (420 X 297)

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MINE SITE POWER DISTRIBUTION: 1kV 3/C CABLE SCHEDULE

ITEM NO.	FEEDER TAG NO.	ORIGIN BUILDING TAG NO.	ORIGIN BUILDING DESCRIPTION	ORIGIN EQUIPMENT TAG NO.	DESTINATION TAG NO.	DESTINATION DESCRIPTION	DESTINATION EQUIPMENT TAG NO.	FEEDER CABLE DESCRIPTION	ESTIMATED LENGTH (M)	SUPPLIED LENGTH (M)	SUPPLY (YEAR)	INSTALL YEAR
1	4511-DSW-004B-P	4750-BLD-001	ACCOMMODATION AREA E-HOUSE #1	4750-SWG-001	4511-BLD-004	LABORATORY	4511-DSW-004B	1 X 1kV TECK90 3/C 350MCM CU	36	54	BE001 (2013)	2013
2	4511-DSW-006A-P	4750-BLD-001	ACCOMMODATION AREA E-HOUSE #1	4750-SWG-001	N/A	ARCTIC WALKWAY	4511-DSW-006A	1 X 1kV TECK90 3/C 350MCM CU	153	230	BE001 (2013)	2013
3	4511-DSW-001A-P	4750-BLD-001	ACCOMMODATION AREA E-HOUSE #1	4750-SWG-001	4511-BLD-001	KITCHEN	4511-DSW-001A	1 X 1kV TECK90 3/C 350MCM CU	112	168	BE001 (2013)	2013
4	4511-DSW-002A-P	4750-BLD-001	ACCOMMODATION AREA E-HOUSE #1	4750-SWG-001	4511-BLD-001	RECREATION	4511-DSW-002A	1 X 1kV TECK90 3/C 350MCM CU	162	244	BE001 (2013)	2013
5	4511-DSW-003A-P	4750-BLD-001	ACCOMMODATION AREA E-HOUSE #1	4750-SWG-001	4511-BLD-003	LAUNDRY	4511-DSW-003A	1 X 1kV TECK90 3/C 350MCM CU	54	81	BE001 (2013)	2013
6	4511-DSW-005A-P	4750-BLD-001	ACCOMMODATION AREA E-HOUSE #1	4750-SWG-001	4511-BLD-001	KITCHEN (PANEL H)	4511-DSW-005A	1 X 1kV TECK90 3/C 350MCM CU	101	152	BE001 (2013)	2013
7	4750-PNB-002-P	4750-BLD-001	ACCOMMODATION AREA E-HOUSE #1	4750-SWG-001	4750-BLD-002	ACCOMMODATION AREA E-HOUSE #2	4750-PNB-002	2 X 1kV TECK90 3/C 350MCM CU	2 X 209	2 X 314	BE001 (2013)	2013
8	4512-DSW-007A-P	4750-BLD-002	ACCOMMODATION AREA E-HOUSE #2	4750-PNB-002	4512-BLD-007	DORM G	4512-DSW-007A	1 X 1kV TECK90 4/C 1/0 AWG CU	135	203	BE001 (2013)	2013
9	4512-DSW-006A-P	4750-BLD-002	ACCOMMODATION AREA E-HOUSE #2	4750-PNB-002	4512-BLD-006	DORM F	4512-DSW-006A	1 X 1kV TECK90 4/C 1/0 AWG CU	114	171	BE001 (2013)	2013
10	4512-DSW-005A-P	4750-BLD-002	ACCOMMODATION AREA E-HOUSE #2	4750-PNB-002	4512-BLD-005	DORM E	4512-DSW-005A	1 X 1kV TECK90 4/C 1/0 AWG CU	144	217	BE001 (2013)	2013
11	4512-DSW-004A-P	4750-BLD-002	ACCOMMODATION AREA E-HOUSE #2	4750-PNB-002	4512-BLD-004	DORM D	4512-DSW-004A	1 X 1kV TECK90 4/C 1/0 AWG CU	106	160	BE001 (2013)	2013
12	4512-DSW-003A-P	4750-BLD-002	ACCOMMODATION AREA E-HOUSE #2	4750-PNB-002	4512-BLD-003	DORM C	4512-DSW-003A	1 X 1kV TECK90 4/C 1/0 AWG CU	126	189	BE001 (2013)	2013
13	4512-DSW-002A-P	4750-BLD-002	ACCOMMODATION AREA E-HOUSE #2	4750-PNB-002	4512-BLD-002	DORM B	4512-DSW-002A	1 X 1kV TECK90 4/C 1/0 AWG CU	83	125	BE001 (2013)	2013
14	4512-DSW-001A-P	4750-BLD-002	ACCOMMODATION AREA E-HOUSE #2	4750-PNB-002	4512-BLD-001	DORM A	4512-DSW-001A	1 X 1kV TECK90 4/C 1/0 AWG CU	92	138	BE001 (2013)	2013

1

PERMIT TO PRACTICE
HATCH LTD.
Signature BKP
Date 2013-11-18
PERMIT NUMBER: P 512
The Association of Professional Engineers, Geologists and Geophysicists of NWT/NU

REGISTERED PROFESSIONAL ENGINEER
B.K. PERKINS
LICENSEE
2013-11-18
NT/NU

FOR CONSTRUCTION

NOTES:

1. EQUIPMENT TAG NO.'S ARE AS PER PROJECT POWER GENERATION AND DISTRIBUTION SLD'S.
2. BUILDING TAG NO.'S AND DESCRIPTIONS ARE AS PER H349000-1000-00-144-0001, MASTER BUILDING MATRIX.
3. ESTIMATED LENGTHS BASED ON H349000-4000-00-014-0003, MINE SITE INFRASTRUCTURE SITE LAYOUT.
4. SUPPLIED LENGTHS BASED ON 50% CONTINGENCY.
5. FIELD VERIFY FEEDER LENGTHS PRIOR TO CUTTING CABLE FROM REEL.
6. FOR 4/C CABLES, THE FOURTH CONDUCTOR IS NOT USED.

1

NO	DESCRIPTION	BY	CHK'D	APP'D	DATE
		MJ	RS	BP	
1	FIELD CHANGES	MJ	RS	BP	2013-11-15

REVISIONS

NO	ISSUE FOR	AUTH. BY		DATE
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0	CONSTRUCTION	BP	JC	2013-09-12

ISSUE AUTHORIZATION

DESIGNED BY A. HUSSAINI DATE 2013-05-01
CHECKED BY M. JAGANI DATE 2013-09-11
PROJ. ENGR. J. CLELAND DATE 2013-09-12
PROJ. MGR. S. PERRY DATE 2013-09-12

HATCH

DRAWN BY J. SAINI DATE 2013-05-01
DISCIP. ENGR. B. PERKINS DATE 2013-09-12
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Baffinland
MARY RIVER PROJECT

MINE SITE
POWER DISTRIBUTION
1KV 3/C CABLE SCHEDULE (SHT. 1 OF 3)

DRAWING NO. H349000-4750-70-007-0002-001
REV. 1

ORIGINAL SHEET SIZE: A3 (420 X 297)

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MINE SITE POWER DISTRIBUTION: 1kV 3/C CABLE SCHEDULE (CONT.)

ITEM NO.	FEEDER TAG NO.	ORIGIN BUILDING TAG NO.	ORIGIN BUILDING DESCRIPTION	ORIGIN EQUIPMENT TAG NO.	DESTINATION TAG NO.	DESTINATION DESCRIPTION	DESTINATION EQUIPMENT TAG NO.	FEEDER CABLE DESCRIPTION	ESTIMATED LENGTH (M)	SUPPLIED LENGTH (M)	SUPPLY (YEAR)	INSTALL YEAR
15	4513-PNB-002-P	4750-BLD-002	ACCOMMODATION AREA E-HOUSE *2	4750-PNB-002	4513-BLD-002	EMERG. RESPONSE GARAGE	4513-PNB-002	1 X 1kV TECK90 3/C 350MCM CU	316	474	BE001 (2013)	2013
16	4521-PNB-003-P	4750-BLD-003	SERVICES AREA E-HOUSE *1	4750-SWG-003	4521-BLD-003	WELDING SHOP	4521-PNB-003	1 X 1kV TECK90 3/C 350MCM CU	244	365	BE001 (2013)	2013
17	4521-SPL-001-P	4750-BLD-003	SERVICES AREA E-HOUSE *1	4750-SWG-003	4521-BLD-001	MAINTENANCE BUILDING	4521-SPL-001	1 X 1kV TECK90 3/C 350MCM CU	148	222	BE001 (2013)	2013
18	4540-PNB-001-P	4750-BLD-003	SERVICES AREA E-HOUSE *1	4750-SWG-003	4540-BLD-001	WASTE MNGMT. BUILDING	4540-PNB-001	1 X 1kV TECK90 3/C 350MCM CU	217	325	BE001 (2013)	2013
19	4521-SPL-002-P	4750-BLD-004	SERVICES AREA E-HOUSE *2	4750-PNB-004	4521-BLD-002	WAREHOUSE	4521-SPL-002	1 X 1kV TECK90 3/C 350MCM CU	117	176	BE001 (2013)	2013
20	4523-SPL-001-P	4750-BLD-004	SERVICES AREA E-HOUSE *2	4750-PNB-004	4523-BLD-001	TRUCK WASH BUILDING	4523-SPL-001	1 X 1kV TECK90 3/C 350MCM CU	130	195	BE001 (2013)	2013
21	4523-CPL-001C-P	4750-BLD-004	SERVICES AREA E-HOUSE *2	4750-PNB-004	4523-VP-001	TRUCK WASH POWER SKID	4523-CPL-001C	1 X 1kV TECK90 3/C 350MCM CU	130	195	BE001 (2013)	2013
22	4731-CPL-005C-P	4750-BLD-005	FUEL TANK FARM E-HOUSE	4750-PNB-005	4731-VP-005	SEWAGE TREATMENT PLANT	4731-CPL-005C	1 X 1kV TECK90 3/C 350MCM CU	81	122	BE001 (2013)	2013
23	4732-PNB-001-P	4750-BLD-005	FUEL TANK FARM E-HOUSE	4750-PNB-005	4732-BLD-001	SEWAGE TRUCK BUILDING	4732-PNB-001	1 X 1kV TECK90 3/C 350MCM CU	54	81	BE001 (2013)	2013
24	4720-PNB-001-P	4750-BLD-005	FUEL TANK FARM E-HOUSE	4750-PNB-005	4720-BLD-001	WATER BUILDING	4720-PNB-001	1 X 1kV TECK90 3/C 350MCM CU	63	95	BE001 (2013)	2013
25	4382-SPL-001-P	4750-BLD-005	FUEL TANK FARM E-HOUSE	4750-PNB-005	4382-BLD-001	TRUCK WEIGH BUILDING	4382-SPL-001	1 X 1kV TECK90 3/C 350MCM CU	415	623	BE001 (2013)	2013
26	4613-MCB-013B-P	4750-BLD-005	FUEL TANK FARM E-HOUSE	4750-PNB-005	4613-FD-013	DIESEL FUEL DISPENSING MODULE	4613-MCB-013B	1 X 1kV TECK90 3/C 350MCM CU	90	135	BE001 (2013)	2013
27	4435-LBS-001C-P	4750-BLD-006	AERODROME AREA E-HOUSE	4750-PNB-006	4435-BLD-001	FIELD ELECTRICAL CENTRE	4435-LBS-001C	1 X 1kV TECK90 3/C 350MCM CU	70	105	BE001 (2013)	2013
28	4712-PNL-001C-P	4750-BLD-007	RAW WATER SUPPLY E-HOUSE	4750-PNB-007	4712-BLD-001	RAW WATER PUMPHOUSE	4712-PNL-001C	1 X 1kV TECK90 3/C 350MCM CU	70	105	BE001 (2013)	2013

PERMIT TO PRACTICE
HATCH LTD.
Signature BKP
Date 2013-09-12
PERMIT NUMBER: P 512
The Association of Professional Engineers, Geologists and Geophysicists of NWT/NU

REGISTERED PROFESSIONAL ENGINEER
B.K. PERKINS
LICENSEE
2013-09-12
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FOR CONSTRUCTION

NO	DESCRIPTION	BY	CHK'D	APP'D	DATE

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DESIGNED BY A. HUSSAINI DATE 2013-05-01
CHECKED BY M. JAGANI MJ. DATE 2013-09-11
PROJ. ENGR. J. CLELAND DATE 2013-09-12
PROJ. MGR. S. PERRY DATE 2013-09-12

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DRAWN BY J. SAINI DATE 2013-05-01
DISCIP. ENGR. B. PERKINS BKP DATE 2013-09-12
SCALE NTS OR AS NOTED

Baffinland
MARY RIVER PROJECT
MINE SITE
POWER DISTRIBUTION
1KV 3/C CABLE SCHEDULE (SHT. 2 OF 3)
DRAWING NO. H349000-4750-70-007-0002-002
REV. 0
ORIGINAL SHEET SIZE: A3 (420 X 297)

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MINE SITE POWER DISTRIBUTION: 1kV 4/C CABLE SCHEDULE

ITEM NO.	FEEDER TAG NO.	ORIGIN BUILDING TAG NO.	ORIGIN BUILDING DESCRIPTION	ORIGIN EQUIPMENT TAG NO.	DESTINATION TAG NO.	DESTINATION DESCRIPTION	DESTINATION EQUIPMENT TAG NO.	FEEDER CABLE DESCRIPTION	ESTIMATED LENGTH (M)	SUPPLIED LENGTH (M)	SUPPLY (YEAR)	INSTALL (YEAR)
1	4140-MPC-003A-P	4513-BLD-002	EMERGENCY RESPONSE GARAGE	4513-PNL-002B	4521-BLD-004	READY LINE 3	4140-MPC-003A	1 X 1kV TECK90 4/C 1/0 AWG CU	245	368	BE003 (2013)	CE001 (2013)
2	4140-MPC-004A-P	4513-BLD-002	EMERGENCY RESPONSE GARAGE	4513-PNL-002B	4513-BLD-002	READY LINE 4	4140-MPC-004A	1 X 1kV TECK90 4/C 1/0 AWG CU	33	50	BE003 (2013)	CE001 (2013)
3	TBD	4513-BLD-002	EMERGENCY RESPONSE GARAGE	4513-PNL-002B	4511-BLD-001	READY LINE 1	TBD	1 X 1kV TECK90 4/C 1/0 AWG CU	190	285	BE003 (2013)	CE001 (2013)
4	4513-PNL-001A-P	4513-BLD-002	EMERGENCY RESPONSE GARAGE	4513-PNL-002A	4513-BLD-001	EMERGENCY RESPONSE OFFICE	4513-PNL-001A	1 X 1kV TECK90 4/C 1/0 AWG CU	72	108	BE001 (2013)	CE001 (2013)
5	4140-MPC-007A-P	4521-BLD-003	WELDING SHOP	4521-PNL-003B	4521-BLD-001	READY LINE 7	4140-MPC-007A	1 X 1kV TECK90 4/C 1/0 AWG CU	210	315	BE003 (2013)	CE001 (2014)
6	4140-MPC-005A-P	4521-BLD-001	MAINTENANCE BUILDING	4521-PNL-001B	4513-BLD-002	READY LINE 5	4140-MPC-005A	1 X 1kV TECK90 4/C 1/0 AWG CU	287	431	BE003 (2013)	CE001 (2014)
7	4140-MPC-006A-P	4521-BLD-001	MAINTENANCE BUILDING	4521-PNL-001B	4521-BLD-001	READY LINE 6	4140-MPC-006A	1 X 1kV TECK90 4/C 1/0 AWG CU	111	167	BE003 (2013)	CE001 (2014)
8	7432-PNL-009A-P	4521-BLD-001	MAINTENANCE BUILDING	4521-PNL-001A	7432-BLD-009	SMOKE SHACK	7432-PNL-009A	1 X 1kV TECK90 4/C 1/0 AWG CU	147	221	BE001 (2013)	CE001 (2013)
9	4521-PNL-005A-P	4521-BLD-001	MAINTENANCE BUILDING	4521-PNL-001A	4521-BLD-005	WORKSHOP OFFICE WASHCAR	4521-PNL-005A	1 X 1kV TECK90 4/C 1/0 AWG CU	130	195	BE001 (2013)	CE001 (2013)
10	4521-PNL-004A-P	4521-BLD-001	MAINTENANCE BUILDING	4521-PNL-001A	4521-BLD-004	WORKSHOP OFFICE	4521-PNL-004A	1 X 1kV TECK90 4/C 1/0 AWG CU	163	245	BE001 (2013)	CE001 (2013)
11	4540-CPL-001B-P	4540-BLD-001	WASTE MNGMT. BUILDING	4540-PNL-001B	4540-VP-001	INCINERATOR	4540-CPL-001B	1 X 1kV TECK90 4/C 1/0 AWG CU	33	50	BE001 (2013)	CE001 (2013)
12	4281-PNL-001A-P	4750-BLD-004	SERVICES AREA E-HOUSE #2	4750-PNL-004A	4281-BLD-001	PIT OFFICE	4281-PNL-001A	1 X 1kV TECK90 4/C 1/0 AWG CU	82	123	BE001 (2013)	CE001 (2013)
13	4140-MPC-008A-P	4750-BLD-004	SERVICES AREA E-HOUSE #2	4750-PNB-004	4281-BLD-001	READY LINE 8	4140-MPC-008A	1 X 1kV TECK90 4/C 1/0 AWG CU	222	333	BE003 (2013)	CE001 (2014)
14	4431-PNL-001A-P	4750-BLD-006	AERODROME AREA E-HOUSE	4750-PNL-006A	4431-BLD-001	AERODROME OFFICE	4431-PNL-001A	1 X 1kV TECK90 4/C 1/0 AWG CU	100	150	BE001 (2013)	CE001 (2013)
15	4140-MPC-002A-P	4750-BLD-006	AERODROME AREA E-HOUSE	4750-PNB-006	4431-BLD-001	READY LINE 2	4140-MPC-002A	1 X 1kV TECK90 4/C 1/0 AWG CU	100	150	BE003 (2013)	CE001 (2013)

NOTES:

1. FEEDER AND EQUIPMENT TAG NO.'S PER PROJECT POWER GENERATION AND DISTRIBUTION SLD'S.
2. BUILDING TAG NO'S AND DESCRIPTIONS PER H349000-1000-00-144-0001 MASTER BUILDING MATRIX.
3. ESTIMATED LENGTH BASED ON H349000-4000-00-014-0001 MINE SITE LAYOUT AND H349000-4000-00-014-0003 MINE SITE INFRASTRUCTURE LAYOUT.
4. SUPPLIED LENGTH BASED ON 50% CONTINGENCY INCLUDING DESIGN, GROWTH AND WASTAGE.
5. FIELD VERIFY FEEDER LENGTHS PRIOR TO CUTTING CABLE FROM REEL.

FOR APPROVAL
NOT FOR CONSTRUCTION

NO	DESCRIPTION	BY	CHK'D	APP'D	DATE

REVISIONS

NO	ISSUE FOR	AUTH. BY	DATE
C	CLIENT APPROVAL	MJ	BP	2013-07-15
B	CLIENT REVIEW	MJ	BP	2013-05-28
A	INTERNAL REVIEW		BP	2013-05-03

ISSUE AUTHORIZATION

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CHECKED BY M. JAGANI DATE 2013-07-15
DRAWN BY J. SAINI DATE 2013-05-03
PROJ. ENGR. J. CLELAND DATE 2013-07-15
DISCIP. ENGR. B. PERKINS DATE 2013-07-15
PROJ. MGR. S. PERRY DATE 2013-07-15
SCALE NTS OR AS NOTED

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Baffinland

MARY RIVER PROJECT

MINE SITE
POWER DISTRIBUTION
1KV 4/C CABLE SCHEDULE

DRAWING NO. H349000-4750-70-007-0003
REV. C

ORIGINAL SHEET SIZE: A3 (420 X 297)

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Appendix C.8:
Site Roads

Design Criteria Civil (H349000-1000-10-122-0001, Rev. 1)

Mine Site Traffic Management Plan Sheet 1 of 2 (H349000-4139-10-035-0001, Rev. 0)

Mine Site Traffic Management Plan Sheet 2 of 2 (H349000-4139-10-035-0002, Rev. 0)

Mine Haul Road Overall Layout (H349000-4221-10-014-0001, Rev. 0)

Mine Site Treated Effluent Pond Access Road Plan & Profile (H349000-4139-10-012-0002, Rev. 0)

Mine Site Explosives Facility Road Plan & Profile (H349000-4139-10-012-0003, Rev. 0)

Milne Port Ramp to the Beach Plan, Profile & Section (H349000-2131-10-012-0001, Rev. 0)

Milne Port Raw Water Intake Road Plan & Profile Sheet 1 of 2 (H349000-2139-10-012-0003, Rev. 0)

Milne Port Traffic Management Plan (H349000-2139-10-035-0001, Rev. 0)

Civil

2013-08-28	1	Approved for Use	A. Mohebkhani	S. Hassan	S. Perry	D. Matthews
2013-03-20	0	Approved for Use	A. Mohebkhani	S. Hassan	S. Perry	D. Matthews
DATE	**REV.**	**STATUS**	**PREPARED BY**	**CHECKED BY**	**APPROVED BY**	**APPROVED BY**

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1. Introduction

- The Mary River project site is located in northern Baffin Island, in Nunavut Territory of the Canadian Arctic. The Project currently consists of activities which entail mining high grade iron ore, at a production rate of 3.5 million tonnes per annum, stockpiling it throughout the year at the Milne Port, and shipping the material during the summer months. Development of this Project includes the infrastructure construction and operational activities associated with the Milne Port and Mine Site areas along with upgrading the 100 km Tote Road connecting the two sites. All associated project infrastructure shall be based on a 5 year design life, with the exception of the laydown areas, for which a 1 year design life shall be considered. 1
- The purpose of this document is to provide the necessary information required for the design of infrastructure at the two project sites (Milne Port and Mine Site). The works covered by this criteria include earthworks, site grading, internal roads, stormwater drainage system and the earthworks for service utilities, to be implemented at the project sites. The design criteria proposed in this document shall be treated as minimum requirements for the intended infrastructure design. Refer to Section 2 of this document for a list of other design criteria and technical design documents from the pertinent disciplines. Where a conflict between the various design criteria occurs, the most stringent shall apply.
- This document is intended to address the key criteria required for the design of site infrastructure.

1.1 Safety

The consideration of personnel safety in all stages of the design, construction and operation is paramount. Prime consideration shall be given to safety and reliability to:

- Maximize health and safety for all personnel.
- Minimize environmental impacts.
- Maximize the security of equipment.

2. Other Project Design Criteria

2.1 This design criteria document shall be read in conjunction with other documents which may already exist or will be developed as the project proceeds. These documents include the following:

- Tote Road Design Criteria (H349000-3100-10-122-0001).
- Structural Design Criteria (H349000-1000-35-122-0001).
- ~~Foundation Design Criteria (H349000-1000-35-122-0002).~~ 1
- Aerodrome Design Criteria (H349000-1000-00-109-0001).
- Layout Design Criteria (H349000-1000-50-122-00030. 1
- Foundation Design Basis (H349000-1000-30-109-0001) □ For Non-Process buildings. 1

3. Units and Coordinate System

3.1 The International System of Units (SI units and prefixes) shall be used for all design calculations and on all drawings.

3.2 The grid coordinates shall be based on: projection - Universal Transverse Mercator (UTM) Zone 17 and horizontal datum - NAD 83 Canadian Spatial Reference System (CSRS).

3.3 Vertical datum shall based on the Canadian Geodetic Vertical Datum of 1928 (CGVD28).

4. References

4.1 Codes, Regulations and Standards

4.1.1 Unless specifically stated otherwise, civil design shall be based on the applicable sections of the latest revisions of the following codes, specifications, standards, regulations and other reference documents. In addition, the design must comply with all laws or regulations of federal and Nunavut territorial authorities.

4.2 General

4.2.1 All applicable federal, territorial (Nunavut) and local laws and regulations.

- OHSA Occupational Health and Safety Act
- CSA Canadian Standards Association
- MHSA Mine Health and Safety Act (Nunavut □ S.N.W.T. 1994)
- OHSR Occupational Health and Safety Regulations
- NBCC National Building Code of Canada (2010)
- ASTM American Society for Testing and Materials
- ASCE American Society of Civil Engineers
- NFPA National Fire Protection Association
- NRC Natural Resources Canada □ Explosives Safety and Security Branch 1

4.3 Roads

- TAC Transportation Association of Canada □ Geometric Design Guide for Canadian Roads
- AASHTO American Association of State Highway and Transportation Officials
- USBM Design of Surface Mine Haulage Roads □ A Manual (US Department of the Interior, Bureau of Mines)
- MSHA Haul Road Inspection Handbook □ MSHA Document Number PH99-I-4
- MTO Ministry of Transportation, Ontario □ Ontario Traffic Manual 1

4.4 Stormwater Management

- MOE Ministry of the Environment - Stormwater Management Planning and Design Manual
- MTO Ministry of Transportation, Ontario □ Drainage Manual
- CDA Canadian Dam Association □ Dam Safety Guidelines 1

4.5 Reference Documents

Reference will be made to/contents have been used from the following documents, articulated during the previous phases of the project, during the development of these criteria:

- H337697-0000-10-122-0001: Stormwater Management and Drainage System Design.
- H337697-6170-10-122-0001: Milne Port Drainage System and Stormwater Management Ponds.
- H337697-6170-10-122-0002: Mine Site Drainage System, Stormwater and Sediment Management.
- H337697-0000-15-124-0004: Geotechnical Data Report □ Infrastructure.
- Standard Specification S311213: □uarried Fill Materials.
- Standard Specification S003120: Site Conditions.
- NB 102-181/30-7: Baseline Hydrology Report, Knight Piesold, Jan 04, 2012.
- BIM - Early Revenue Phase Mine Haul Road Design Criteria.
- BIM - Early Revenue Phase Tote Road Design Criteria.
- H349000-3000-00-124-0001: NB102-00181 Bulk Sampling Program □ Road Upgrade Design Summary.
- Final Environmental Impact Statement (FEIS), Mary River Project, February 2012.
- Nunavut Impact Review Board (NIRB) Project Certificate (No.:005), Dec 28, 2012.
- H349000-4221-10-220-0001: Number of Runaway Truck Arresting Provisions for the Mine Haul Road, Project Memo. 1
- H349000-2133-10-220-0001: Runoff Coefficient for the Milne Port Ore Stockpile Pad, Project Memo. 1
- H349000-1000-15-122-0001: Geotechnical Design Criteria 1
- H349000-1000-10-220-0001: Stormwater Sedimentation Pond Design Criteria, Project Memo. 1
- E349000-1000-00-124-0005: Design Brief □ Milne Inlet Landfarm, November 2012, EBA File E14101174. 1

5. Site Development

Site development refers to construction of civil infrastructure to support construction and operation of facilities. The following sections list the site development activities and establish criteria that shall be adhered to when carrying out site development design works.

5.1 Site Preparation

5.1.1 Construction areas shall be cleared of vegetation, and temporary drainage systems shall be provided prior to construction activities taking place within the proposed areas for the new site facilities.

5.1.2 Topsoil and/or existing roots shall be removed to a minimum depth of 150 mm, if required, from all areas where buildings, roads, yards and services are to be constructed, and shall be stockpiled in designated areas. Disposal options shall include on-site reuse, development of a designated stockpile area for disposal, or removal by truck to off-site areas, as instructed by the Company.

5.1.3 During the summer months, wetlands or areas with standing water shall be drained and the drying of such shall be promoted prior to construction. Watercourses shall be re-routed with the use of cut-off ditches, or re-aligned engineered channels.

5.1.4 Waste material shall be stockpiled in designated areas with the appropriate erosion and sedimentation control measures in place. 1

5.2 Earthworks

5.2.1 Earthworks is defined as the activity of moving soil and/or rock. Earth-moving activities are required in order to obtain the required design elevations of the ground surface. Earthworks includes cut (if required) and fill for roads, buildings and equipment pads, utility berms, foundation excavation, and construction of ditches, diversion channels and berms, dikes, etc. Earthworks shall be carried out in accordance with the following general guidelines: 1

- Existing unsuitable soils shall be removed and replaced with suitable material.
- Fill materials shall be placed and compacted over the proof-rolled subgrade in order to achieve adequate bearing capacities, as required for specific construction activities.
- Rocks/boulders and similar objects adjacent to areas which shall undergo excavation must be removed or secured, if they potentially endanger workers/machinery.
- The following criteria shall be used to determine the suitability of the soil for fill:
  - Satisfactory soil: ASTM D 2487 Soil Classification Groups GW, GP, GM, SW, SP, and, SM, or a combination of these groups; non ice-rich, free of debris, waste, vegetation and other deleterious matter. 1
  - Unsatisfactory soil: According to ASTM D 2487 Soil Classification Groups GC, SC, CL, ML, OL, CH, MH, OH and PT; according to AASHTO M145 Soil Classification Groups A-2-6, A-2-7, A-4, A-5, A-6 and A-7 or a combination of these groups. Also, ice-rich soils or soils containing traces of contamination and/or organic materials. 1
  - Water shall be diverted away from excavations, so it does not saturate the side slopes.

- If pipes are located in the vicinity of the slopes, erosion control measures shall be in place as mitigation for eventual leaks.
- No loads, including excavated material, traffic of vehicles or heavy machinery shall be allowed near the crest of the slopes (at a distance equal to the height of the excavation) if the slope-support solutions did not take such loads into account.
- Dust control measures shall be in place.
- For delineation of the project development boundaries, the minimum setback from freshwater aquatic environments, including fish-bearing streams and water bodies shall be as per NIRB Project Certification No.005. In general, a minimum 5 m set back shall be provided for non fish-bearing water bodies and streams, due to the potential risks of erosion and slope stability.
- Culvert installation in fish-bearing streams shall follow DFO guidelines.

5.2.2 Table 5-1 provides the minimum slope ratios that shall be used in cuts/excavations or fills/embankments. It must be noted that specific studies must be carried out by geotechnical engineers, if these slopes are to be modified with the aim of lowering costs of cut and/or fill.

Table 5-1: Minimum Slope Ratios

Type of Earthworks	Layer	Ratio H:V	
Permanent unsupported cuts	Overburden (ice-rich)	2:1	1
	Overburden (non ice-rich)	1.5:1	1
	Rock (less than 4m)	1:8	1
Permanent fills (on natural, firm ground)	Granular fill	1.5:1	
	Base and Subbase	1.5:1	
	Rock fill	1.5:1	1

Notes:
1. The maximum heights and ratios shall be determined considering slopes with typical geometry and no surcharge.
2. The above-listed parameters serve as minimum requirements, and shall be updated/modified based on confirmation/update of the site-specific conditions and/or geotechnical recommendations, or as per BIM□s directions.
3. Any geometry and load condition not covered by the table above shall be reviewed by the geotechnical engineer.
4. The granular fill is assumed to be in a drained condition.
5. If the total fill height is greater than 2 m, geotechnical stability analysis and benching requirements shall be considered on a case-specific basis. 1
6. For overburden cut/fill heights of greater than 5 m, 1.5 m wide benching with minimum 2□ cross slope shall be provided. 1
7. The absolute minimum fill slope for granular material is 1.5H:1V. However, the desirable slope is 2H:1V.
8. The absolute minimum fill slope for rock fill material is 1.25H:1V. However, the desirable slope is 1.5H:1V.
9. For the haul road, the fill side slopes shall be 2H:1V, depending on the site conditions and slope stability.
10. Stability assessments of some cut and fill slopes may be required. 1
11. For rock cut heights greater than 4 m, 1H:4V slope shall be used with 2 m wide benching and minimum 2□ cross slope at every 6 m.

5.2.3 In general, cut activities in permafrost shall be avoided/minimized. However, cut may be required to reduce large fills and high embankments that may affect/endanger slope stability. In addition, within areas where the cut materials can be reused as fill, the suitability of performing cuts in the native soil shall be reviewed by BIM and the geotechnical engineer for requirements of soil treatment/improvement, including geogrids and geotextiles, prior to implementation into the final design. 1

5.3 Backfilling

5.3.1 The gradation of fill material shall be within the Type 5 (32 mm minus) gradation limit for finish grading, within the Type 8 (150 mm minus) and/or suitable earth fill material gradation limit for rough grading, and Type 12 (600 mm minus) and/or suitable earth fill material gradation limit for the rest of the mass backfill. The surface voids of each layer of Type 12 (i.e. Run-of-□uarry material) shall be filled with rock fragments prior to the next layer being placed. 1

5.4 Site Grading

5.4.1 If applicable, finish grade elevations for roads and yards shall be set a minimum of 100 mm below the finish floor elevation of buildings/sheltered areas, with local ramps provided at doorways, as required. 1

5.4.2 Finish grading and yard grading shall be set to slope away from planned structures at a minimum of 0.5□ to 2□, and drain to a storm drainage collection system. For very long-run and localized areas, the slope shall be reduced or increased, depending on the existing ground slope and the grading around the buildings and facilities.

5.4.3 Site grading shall produce a useable and easily maintainable ground surface, not subject to flooding or erosion. The rough grades and finish grades shall adhere to the following:

- Final road and site grades shall ensure suitable pedestrian and vehicular access to buildings and facilitate adequate drainage of the site.
- Building floor elevations shall be established such that the ground floor of the buildings will not be subject to flooding in the event that the storm drainage system fails.
- Elevations of buildings/sheltered areas shall be established to permit gravity connections into sanitary sewers if possible, to avoid the need for pumps.

5.5 Infrastructure Facilities, Laydown and Ore Stockpile Areas

5.5.1 Temporary/permanent equipment and construction material laydown areas shall be provided as per the applicable Contract Drawings. The sizes of the footprints shall be optimized to keep disturbed areas to a minimum and still provide enough room for storage of material/equipment and circulation of mobile cranes/vehicles.

5.5.2 The subgrades shall be prepared via cut/fill activities prior to pavement installation/placement. If the height of the subgrade fill is less than 600 mm, Type 8 (150 mm minus) fill shall be used. If the height of the subgrade fill is greater than 600 mm, Type 12 Run-of-□uarry (600 mm minus) and/or suitable earth fill material shall be used. The voids of each layer of Type 12 shall be filled with rock fragments prior to placement of the next layer. 1

5.5.3 In general, following attainment of the subgrade, the pavement shall be laid on top, with the following minimum thicknesses/material types for infrastructure facility pads and other areas:

- 300 mm, Type 8 (150 mm minus) subbase.
- 100 mm, Type 5 (32 mm minus) base/wearing surface course. 1

5.5.4 Depending upon the area and specific requirements such as insulation for permafrost protection, the minimum pavement thicknesses and placement of wearing courses may differ from the above-listed.

5.5.5 There shall be no insulation under □fold-away□and □fabric□buildings constructed on non-frost susceptible ground material (typical for Milne Port). 1

5.5.6 Insulation shall be provided under □fold-away□and □fabric□buildings constructed on frost susceptible ground material (typical for Mine Site). 1

5.5.7 Frost susceptible and ice-rich soils shall be excavated to the extent required and backfilled with Type 12 Run-of-□uarry (600 mm minus). Non-frost susceptible soils with no visible ice shall not be excavated. 1

5.6 Landfarm

~~5.6.1 Both the Milne Port and Mine Site landfarms shall be designed as per the criteria listed in Section 3.2 of Annex 5 in the FEIS, Attachment 5: Waste Management Plan for Construction Operation, and Closure; Appendix 10D-4.~~ 1

~~5.6.2 The overall geometry as well as the liner details shall be as per Figure 3, □Hydrocarbon Impacted Soils Storage and Landfarm Facility □ Preliminary Design of Landfarm Facility□ contained within Attachment 5.~~ 1

5.6.3 EBA Engineering Consultants Ltd. has already carried out the design for the Milne Port Landfarm. 1

5.6.4 Milne Port and Mine Site Hazardous Waste Containment designs shall be carried out as per environmental requirements. They shall be lined, and shall contain sumps. 1

5.7 Milne Port Design High Tide

5.7.1 The design High Tide levels for the Project shall be as follow: 1

- The Higher High Water Level (HHWL) for large tides at the Milne Port is □2.3 m above Chart Datum (CD) which corresponds to □1.1 m above Mean Sea Level (MSL). 1
- The Highest Astronomical Tide (HAT) at the Milne Port is □2.4m above CD which corresponds to □1.2 m above MSL. 1
- The Lower Low Water Level (LLWL) for large tides at the Milne Port is □0.0 m above CD which corresponds to -1.2 m below MSL. 1

5.7.2 The toe of ramp and earthworks pad leading down to the sea lift from the laydown area, including the designated turnaround area at the beach within the Milne Port shall have a design elevation greater than □1.2 m above MSL. 1

5.7.3 Landing pad elevation at the beach shall be minimum 7□(2.15 m) above the average between the HHWL and LLWL (i.e. □3.3 m above CD which corresponds to □2.1 m above MSL). 1

5.8 Retaining Walls

5.8.1 Retaining walls and structures shall be designed based on site-specific conditions. Lateral pressure coefficients for design of retaining walls shall be as per the geotechnical recommendation.

5.8.2 Retailing walls shall be avoided to the greatest extent possible. Concrete, gabion walls, crib walls, reinforced earth and/or other systems of retaining structures shall be used, if required.

5.9 Erosion and Sediment Control

5.9.1 Erosion and sediment control measures shall be installed as required, in and around the project sites in order to minimize sediment transport off the site.

5.9.2 Control measures shall be designed to:

- Minimize the size of disturbed areas.
- Remove sediments from on-site runoffs prior to the runoff leaving the sites.
- Prevent sediments from off-site runoffs flowing across disturbed areas.
- Reduce runoff velocity flowing across the site.
- Meet local requirements for erosion and sediment control plans as defined in the FEIS.

5.9.3 A minimum set back of 30 m from fish-bearing streams and lakes or water bodies shall be provided. Any exception to this shall be consulted with and approved by the Project□s environmental team. 1

5.10 Construction and Permanent Fencing

5.10.1 Chain link fence, where required, shall be galvanized, with a minimum height of 1.8 m.

5.10.2 Two strands of barbed wire shall be bracketed off the top of the fence for safety reasons, where required by the Company.

5.10.3 Fencing within the sites shall be provided as required and as directed by the Company.

5.11 Explosives Magazine Pads and Earth Barricades 1

5.11.1 Explosives magazine pads shall be designed as per the criteria in Section 5.5 of this document. 1

5.11.2 Geometry of the Explosives Magazine Earth Barricades shall be designed in accordance with the □uantity-Distance Principles Manual from the Natural Resources Canada, Explosives Safety and Security Branch. 1

6. Road Design

6.1 General

6.1.1 The access roads at the two project sites may be temporary or permanent. An access road is defined as temporary if it will be used only during the construction period, including site predevelopment or site capturing. If an access road will be used during the operational period as well, it is defined as permanent. A 100 km roadway provides access from the Mine Site to the Milne Port (Tote Road), the design criteria for which is included in a separate document. In addition, there is a mine haul road along with internal site roads at the Mine Site, and internal site roads only within the Milne Port, in order to accomodate the mining operations.

6.1.2 The design and construction of mine haul roads, access and internal site roads at the project sites shall provide a safe environment for construction, operations and maintenance personnel, and shall facilitate the mining operations, ore transport and port operations in an efficient manner. In addition, the design shall comply with the relevant standards, guidelines, acts, approvals, permits, and other contractual environmental requirements of Baffinland as defined in Section 2 of this document.

6.2 Road Category

6.2.1 For the purposes of this design criteria, the roads are classified in three categories:

- **Mine Haul Roads -** The purpose of this type of road is for the mining operation at the mine site - hauling of ore from the open pit to the crusher pad and for maintenance purposes, from the crusher pad to the maintenance building. The mine haul road shall be segregated from the other project roads for safety considerations, and shall comply with the applicable Nunavut MHSA.
- **Permanent Access and Internal Site Roads –** These roads provide two way access to and link the various facilities/areas within each site, where B-Trains will travel in both directions.
- **Facility Service Roads –** These roads provide two way access to various facilities/areas within each site, where light vehicles will travel in both directions.
- **Tote Road –** 100 km road providing access from the Mine Site to the Milne Port.

6.3 Design Vehicle

6.3.1 The following design vehicles shall be utilized for the design of the associated project roadways:

- CAT 777G Haul Truck for the Mine Haul Road.
- B-Train (12 axle) for Permanent Access Roads and Internal Plant Roads (150 metric tonnes payload) that need to be utilized by the Tote Road trucks. 1
- CAT 740B for Waste Rock Drainage Pond/Berm. 1
- Other types of design vehicles have been used for the remainder of the Project roadways and a fire truck has been considered as the minimum design vehicle for fire access routes. 1

6.4 Geometric Design Criteria

6.4.1 All roads shall be designed as gravel roads and shall accommodate the design vehicle specified in Section 6.3 of this document. The roads geometric design parameters are specified below.

Table 6-1: Geometric Design Criteria

Road Type	Permanent Internal Plant Road	Infrastructure Facility Service Road	Haul Road – Open Pit to Crusher Pad	Waste Rock Dump Road	Haul Road Switchback	Truck Escape Ramps
Number of Lanes	2	2	2	1	2	1
Design Speed (km/h)	30	30	50	30	30	90
Posted Speed (km/h)	20	20	40	20	20	-
Total Road Width (m)	9.2	8 or 6	20	13	20	9
Minimum Horizontal Curve C/L Radius (m)	35	35	100	50	35	280
Minimum Intersection Inner Radius (m)	15	15	30	30	30	-
Minimum Cross Slope ( )	2	2	3	3	3	3
Maximum Grade ( )	10	10	10	10	8	20
Minimum K Value (Vertical Sag Curve)	8	8	12	8	8	3
Minimum K Value (Vertical Crest Curve)	4	4	16	4	4	-
Maximum Super-elevation ( )	4	4	4	4	4	6
Minimum Vertical Clearance	7	5	9	9	9	-

Notes:
1. The road design parameters are based on the desirable design speeds. Specific parameters such as the minimum turn radii may be modified for some areas locally on a case-by-case basis, via adjustment of the design speeds.
2. The Haul Road width shall be based on the Nunavut Mine Health and Safety Act which requires a minimum travel width three times the width of the widest haulage vehicle for dual lane traffic and two times the width of the widest haulage vehicle for single lane traffic.
3. Shoulder barriers (safety berms or guardrails) for the Haul Road shall be based on the Nunavut Mine Health and Safety Act which requires shoulder barriers of at least the height of the largest tire of any vehicle using the road and shall be provided along the edge of the haul road wherever a drop-off greater than 3.0m exists. For CAT 777G, the shoulder barrier (safety berm or guardrail) height shall be 2.0 m based on standard tire 27.00 R49 (E4).
4. Total road width includes shoulder width and snow allowance but doesn include the safety berm width for the haul road.
5. ~~For the single lane Haul Road from the crusher pad to the maintenance building, pullouts shall be provided at every 100m.~~
6. Widening shall be provided in roadway curves as necessary.
7. Need for geotextiles or geogrids shall be considered on a case-specific basis.
8. For the Tote Road design criteria, refer to H349000-3100-10-122-0001.
9. Provide safety stations, emergency ramps or escape lanes in accordance with the local and mine safety requirements. Hatch will only provide two escape ramps at the most critical locations as per BIM s instruction. Escape ramp design shall be carried out as per the USBM manual.
10. For cut/fill heights of greater than 5 m, provide 1.5 m wide benching with minimum 2 cross slope at every 5 m.
11. The ramp leading down to the sea lift from the laydown area at the Milne Port shall have a maximum grade of 8 .
12. The maximum grade for ramps to the buildings is 6 .
13. Fill toe key shall be provided in areas where the existing ground is steeper than 3H:1V away from the road.
14. Design speeds may be reduced locally if needed.