



TETRA TECH EC, INC.

DOCKET

11-AFC-3

DATE APR 06 2012

RECD. APR 06 2012

April 6, 2012

Mr. Eric Solorio
Project Manager
California Energy Commission
Docket No. 11-AFC-3
1516 9th St.
Sacramento, CA 95814

Cogentrix Quail Brush Generation Project – Docket Number 11-AFC-3, Data Request Responses to Set 2

Dear Mr. Solorio:

Pursuant to the provisions of Title 20, California Code of Regulation, Quail Brush Genco, LLC, a wholly owned subsidiary of Cogentrix Energy, LLC, hereby submits the *Data Request Responses to Set 2 for the Quail Brush Generation Project*. The Quail Brush generation Project is a 100 megawatt natural gas fired electric generation peaking facility to be located in the City of San Diego, California.

These six responses were compiled in response to the Energy Commission's QUAIL BRUSH GENERATION PROJECT (11-AFC-3), Staff's Data Requests, 59 through 64, dated March 5, 2012 and posted on April 4, 2012. This document provides the additional information necessary to fulfill the Application for Certification data requests for the following technical areas:

- Transmission System Engineering

If you have any questions regarding this submittal, please contact Rick Neff at (704) 525-3800 or me at (303) 980-3653.

Sincerely,

A handwritten signature in blue ink that reads 'Constance E. Farmer'.

Constance E. Farmer
Project Manager/Tetra Tech

cc: Lori Ziebart, Cogentrix
John Collins, Cogentrix
Rick Neff, Cogentrix

Transmission System Engineering

59. Provide a complete electrical one-line diagram (or resubmit Exhibit 4 with amended size/ratings of the applicable equipment and/or missing elements) of the proposed QGBP 138/13.8 kV switchyard showing all equipment for all eleven generator units' interconnection with the switchyard with their respective sizes and/or ratings as follows: i) Any bus duct connectors or overhead conductors or cables, 13.8/15 kV switch gear, buses, breakers & disconnect switches on the low side of generator step-up transformer (GSU). ii) The GSU and short overhead conductors/cables from the GSU high side to the switchyard 138 kV bus with the configuration of the switchyard 138 kV buses, breakers, disconnect switches, along with the proposed generator (gen) tie line transmission outlet.

Response:

Drawing QBPP-E001 Rev. E "Quail Brush Key One-Line Diagram" is attached as Attachment A.

60. Provide a physical layout drawing of the QGBP 138/13.8 kV switchyard showing all major equipment (generators, buses, transformers, breakers and disconnect switches etc.) and transmission line outlet(s).

Response:

Drawing QB-SP-3 Rev. A "Quail Brush Switchyard Layout" is attached as Attachment B (based on the Site Plan included as Figure 2.3-1 from the AFC). A typical A frame structure is attached as Attachment C.

61. Please provide a discussion and drawing of the physical layout showing distinctly (in a larger scale) the preferred route (along any road or land or overhead line) of the proposed 6,850-foot long 138 kV overhead gen tie line including Right of Way (ROW) width(s) between the proposed QGBP 138 kV switchyard and the SDG&E 138 kV Carlton Hills substation. Describe whether the ROW would be through private and/or public lands.

Response:

As indicated on Figure 1.1-1 "Project Layout" of Supplement 2 to the AFC docketed February 8, 2012, Quail Brush proposed 4 gen tie routes labeled as Preferred, Alternative 1, Alternative 2, and Alternative 3.

Quail Brush is currently focused on three gen tie routes. The routes are denoted as Preferred, Alternative 2a, and Alternative 2b and depicted on the attached Figure 1.1-1 "Project Layout". After running north/northeast from the QGBP switchyard for approximately 1,350 feet, the Preferred route runs immediately south of the existing SDG&E 138 kV line and parallels this line to the Carlton Hills Substation (Figure 1.1-1a). The Alternative 2a route crosses the existing SDG&E 138 kV line and parallels the line on the north to the Carlton Hills Substation. The Alternative 2b route also crosses the existing SDG&E 138 kV line, but then takes a more direct route into the Carlton Hills Substation as shown on Figure 1.1-1. The Preferred route will terminate on the empty south bay of the Carlton Hills Substation presently depicted on the SDG&E drawings labeled "After Quail Brush" included in Attachment K. Alternative 2a or 2b routes will terminate on the empty north bay of the

Carlton Hills Substation. Once the final route for the gen tie is selected, the SDG&E drawings provided in Attachments K and L will be updated accordingly.

The crossing of the existing SDG&E 138 kV line required in Alternative 2a and Alternative 2b will not be underground. The crossing would be accomplished by passing the gen tie underneath the SDG&E 138 kV transmission lines but above the ground. The required clearances from the gen tie conductors and SDG&E conductors, as well as, between the gen tie conductors and the ground shall be maintained. Plan and profile drawings for the Preferred, Alternate 2a, and Alternative 2b gen tie routes are included as Attachments D, E, and F, respectively.

In all cases the proposed Quail Brush gen tie right-of-way (ROW) width is 150 feet and runs entirely on private land.

62. Please submit design diagrams of the tangent steel pole and heavy-angle steel pole showing configuration of insulators and conductors with their respective position measurements on the pole including ground clearance from the lowest conductor, height of the pole above and below ground, and the ground conductor, if any, with its size. Also include similar design diagrams of the dead-end poles or structures for the overhead gen tie line at each end.

Response:

The Preferred route has 14 structures and a detail sheet is provided for each (note the structure numbers are shown in the upper right hand corner of the detail sheets) in Attachment G. The Alternative 2a route has 16 structures and all detail sheets are provided in Attachment H. Structures 9 and 10 of the Alternative 2a route are not labeled as such but are detailed on the "H-Frame DE" sheet (Attachment I). The Alternative 2b route has 14 structures and all detail sheets are provided in Attachment J. Same as the Alternative 2a route, structures 9 and 10 are not labeled as such but are detailed on the "H-Frame DE" sheet (Attachment I). The preliminary design of these transmission poles and structures including foundations and burial depth will be finalized during the detailed design phase of the Project and once the final gen tie route has been selected.

The dead-end pole at the QBGP switchyard is depicted on Attachment C. The dead-end pole at SDG&E's Carlton Hills substation is depicted on Attachment L.

63. Please provide pre and post-project electrical one-line diagrams of the SDG&E Carlton Hills 138 kV substation with all transmission outlets showing the proposed modifications in the substation for interconnection of the gen tie line along with configuration of buses, breaker, disconnect switches, and their respective sizes and/or ratings.

Response:

The pre- and post-Project electrical one-line diagrams of the Carlton Hills 138 kV substation have been provided by SDG&E and are included as Attachment K. The post-Project drawings in Attachment K depict the Preferred route terminating in the empty south bay of the Carlton Hills Substation.

64. Also provide pre and post-project physical layout drawings of the SDG&E Carlton Hills 138 kV substation with all transmission outlets.

Response:

Pre-and post-Project physical layout drawings of the Carlton Hills 138 kV Substation have been provided by SDG&E and are attached as Attachment L. The post-Project physical layout (elevation drawing) at the Carlton Hills 138 kV Substation is represented by Section 2-2 on Attachment L. The pre- and post-Project general arrangements of the Carlton Hills 138 kV Substation are included in Attachment K.

Figures

Figure 1.1-1 Project Layout

Figure 1.1-1a Preferred Route

Attachments

Attachment A Quail Brush Key One-Line Diagram

Attachment B Quail Brush Switchyard Layout

Attachment C Typical A Frame Structure

Attachment D Preferred Route

Attachment E Alternative 2a Route

Attachment F Alternative 2b Route

Attachment G Preferred Route

Attachment H Alternative 2a Route Detail Sheets

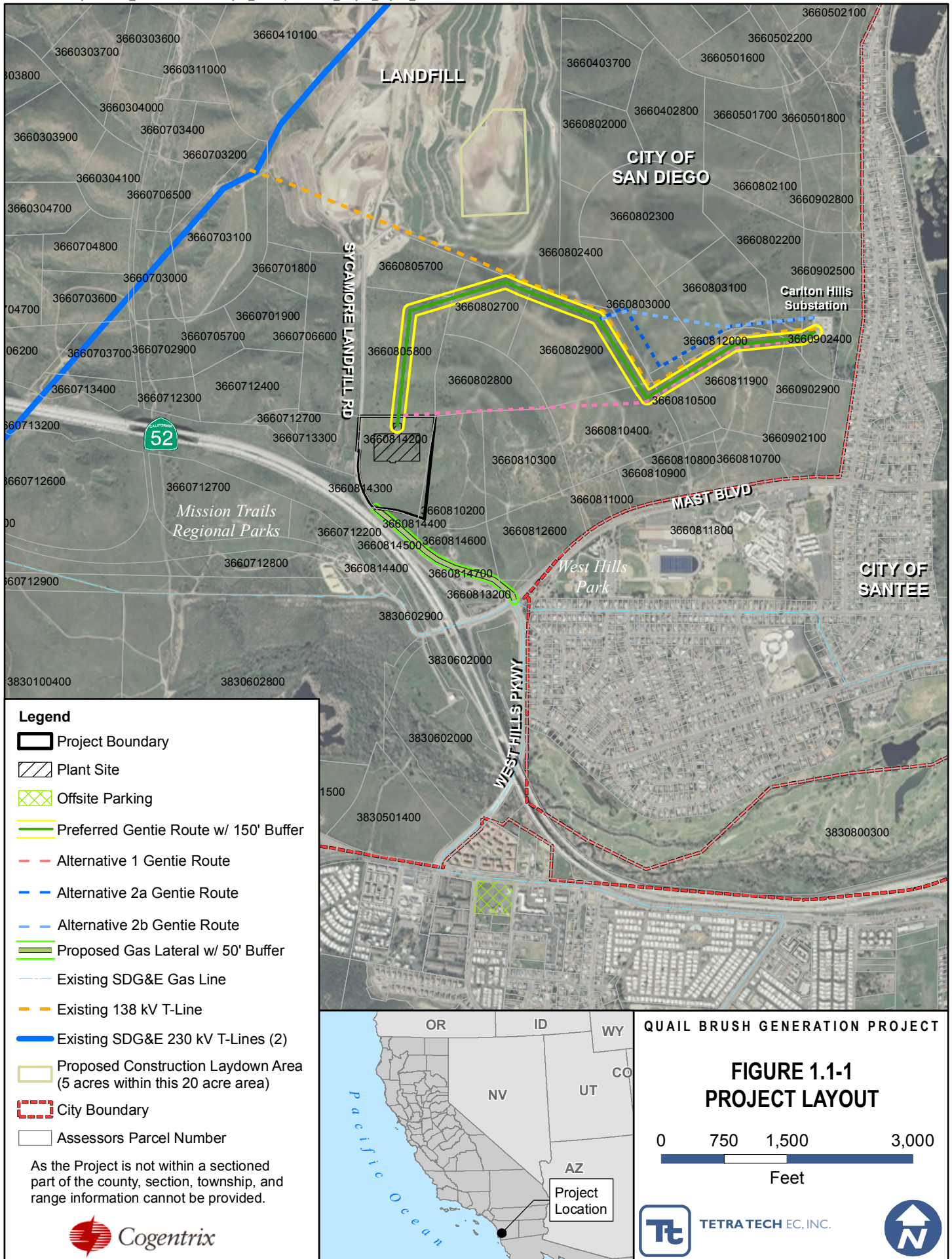
Attachment I H-Frame DE

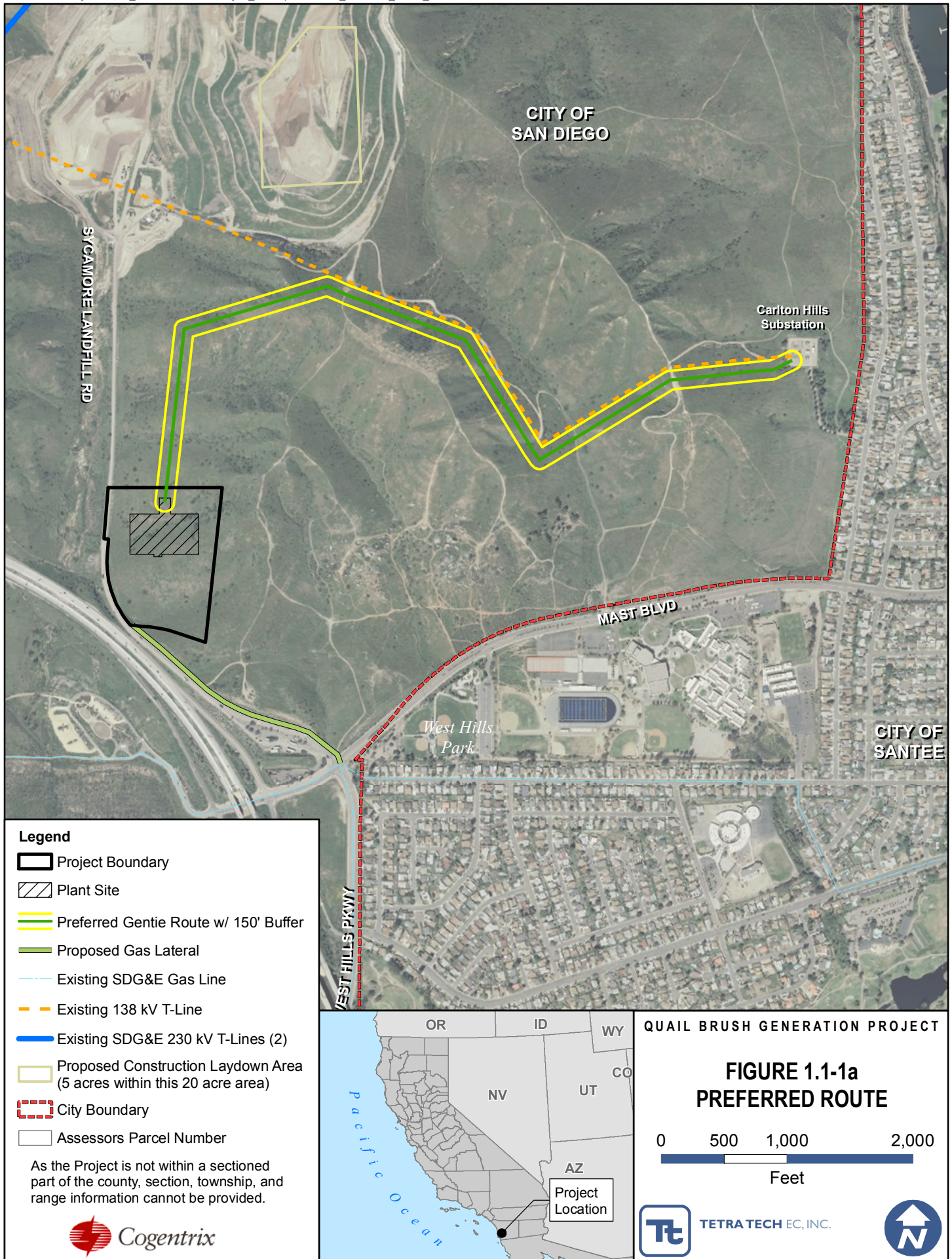
Attachment J Alternative 2b Route Detail Sheets

Attachment K Pre- and Post-Project Electrical One-Line Diagram

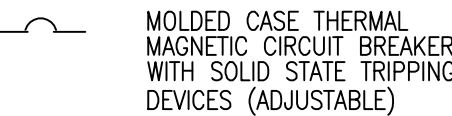
Attachment L Pre- and Post-Project Physical Layout Drawings

FIGURES



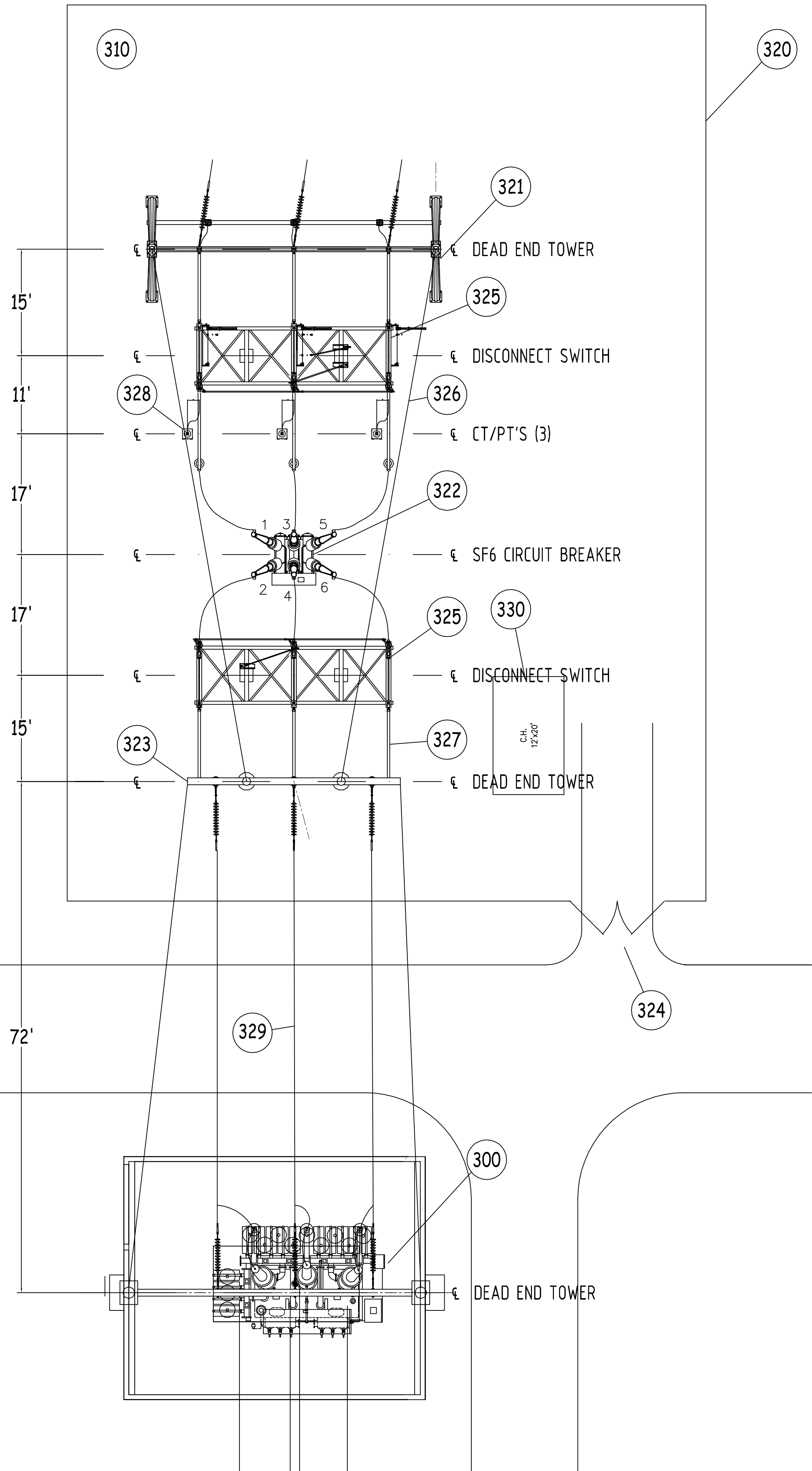
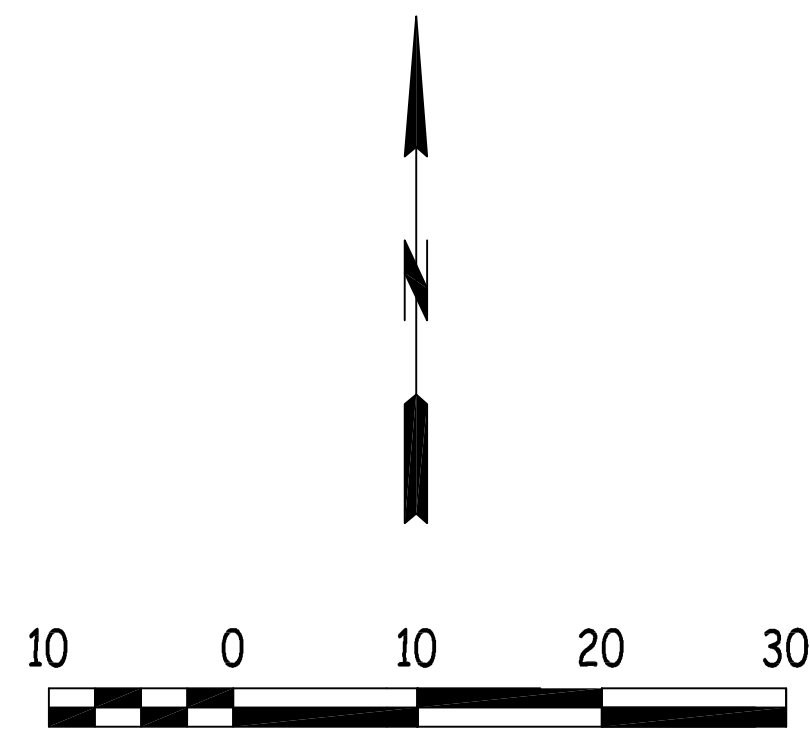


ATTACHMENT A
QUAIL BRUSH KEY ONE-LINE DIAGRAM



Rev No	Revision	Date	Dwn	ChKd	Approved Chief Engr	Drawing Control					Engineering Review						
A	INITIAL ISSUE 03/14/11					Purpose	Approved By	Date	Released By	Date	Disc	Engr	Date				
B	CHANGED SUBSTATION TO SWITCHYARD 06/07/11					For Information					Mech						
C	REVISED TITLE; ADDED DEAD-END STRUCTURES TO SWITCHYARD 08/22/11					For Comment					Elec						
D	ADDED CT'S & METERS; REVISED GEN TIE; REVISED INTERCONNECT VOLTAGE 02/08/12					For Bid					Civil						
E	EXPANDED DETAILS OF SWITCHYARD, SWITCHGEAR & LOAD CENTERS 02/10/12					For Construction					Arch						
											I & C						
											Dwn HPK	ChKd	SI				
											QUAIL BRUSH KEY ONE-LINE DIAGRAM						
											Reviewed By	App'd for Construction	Date 03/14/11	Work Order	Drawing No. QBPP-E001	Rev E	
											Mar - Drafting & Design	Chief Engineer	Scale				

ATTACHMENT B
QUAIL BRUSH SWITCHYARD LAYOUT



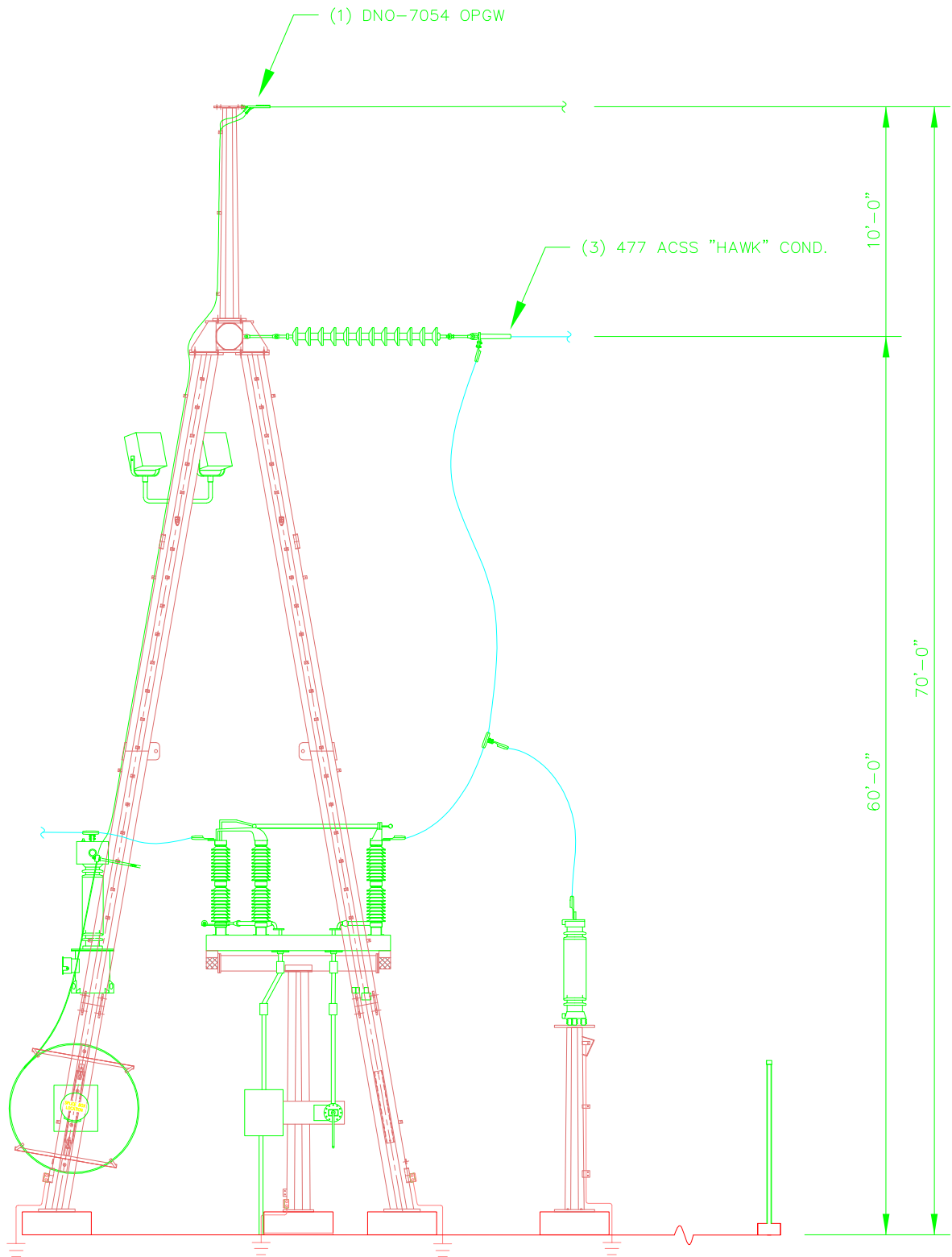
138 KV FACILITY SWITCHYARD		
NO.	QTY.	DESCRIPTION
300	1	138/13.8 kV Generator Step-Up Transformer (GSUT)
310	1	Facility 138 kV Switchyard
320	1	Switchyard Fence
321	1	138 kV Dead End Structure, Outgoing Line
322	1	145 kV SF6 Circuit Breaker
323	2	13.8 kV Dead End Structure
324	1	Gate
325	2	Three Pole High Voltage Air Break Disconnect Switch
326	4	Overhead Static Line
327	6	Air Insulated Aluminum Tubular Bus and Supports
328	3	CT/PT Unit
329	6	477 kcmil ACSS Conductor (Hawk)
330	1	Switchyard Control House

REFERENCE DRAWINGS

QB-SP-2 Quail Brush Master Layout Plan

Revision					Date	Dwn	Chkd	Approved Chief Engr	Drawing Control					Engineering Review			Cogentrix Quail Brush Switchyard Layout			
									Purpose	Approved By	Date	Released By	Date	Disc	Engr	Date				
A	Initial Issue								For Information					Mech			App'd for Construction Chief Engineer			
									For Comment					Elec						
									For Bid					Civil			Date 3/1/12 Scale			
									For Construction					Arch						
														I & C			Work Order			
														Dwn VV	Chkd	SI				
														Reviewed By			Drawing No. QB-SP-3			
														Mgr – Drafting & Design						
																	Rev A			

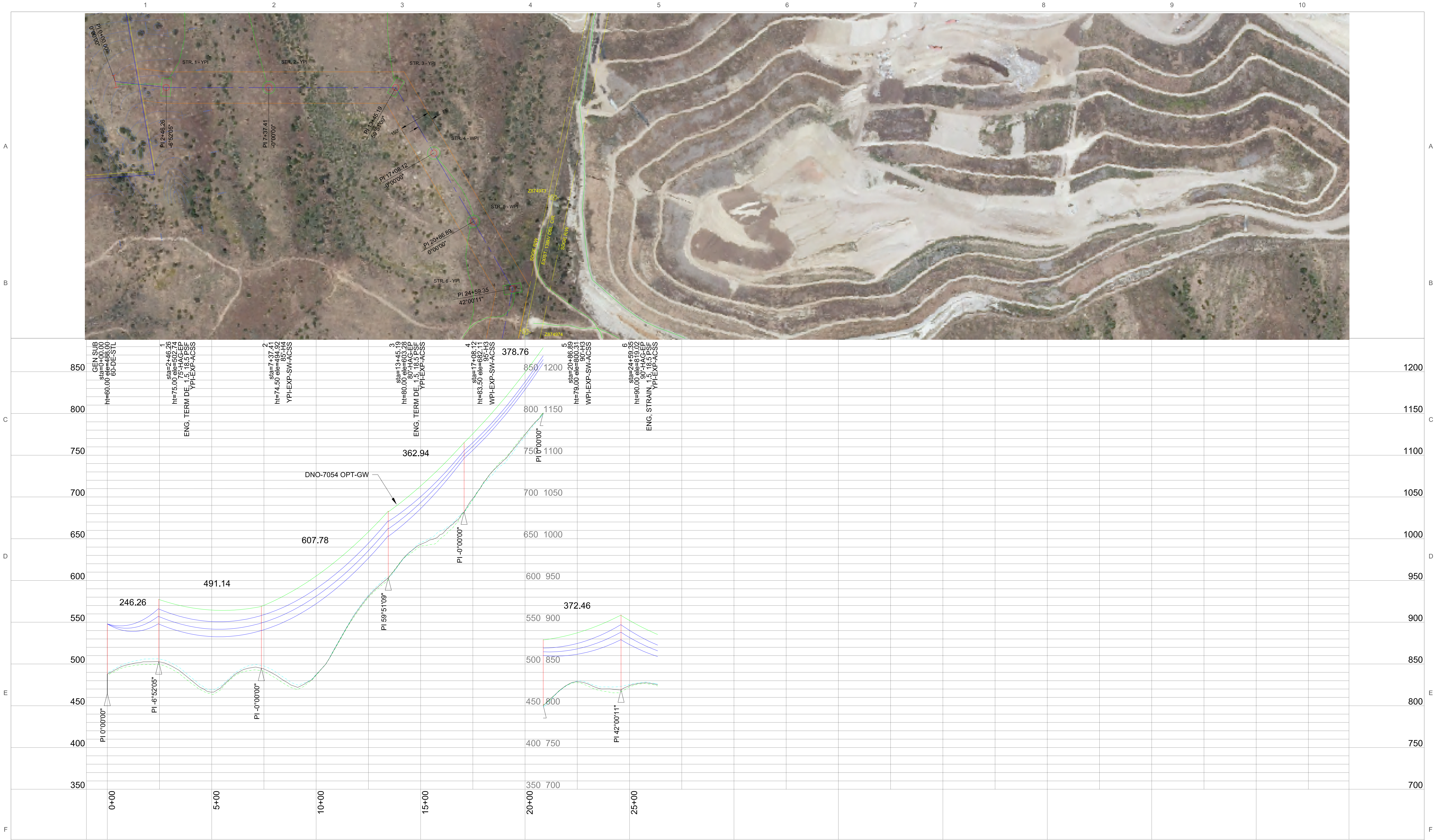
ATTACHMENT C
TYPICAL A FRAME STRUCTURE



QUAIL BRUSH A-FRAME DE

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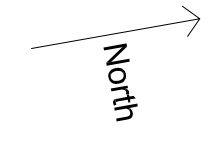
ATTACHMENT D
PREFERRED ROUTE



PRELIMINARY

NOTES:

200.0 ft. Horiz. Scale
50.0 ft. Vert. Scale

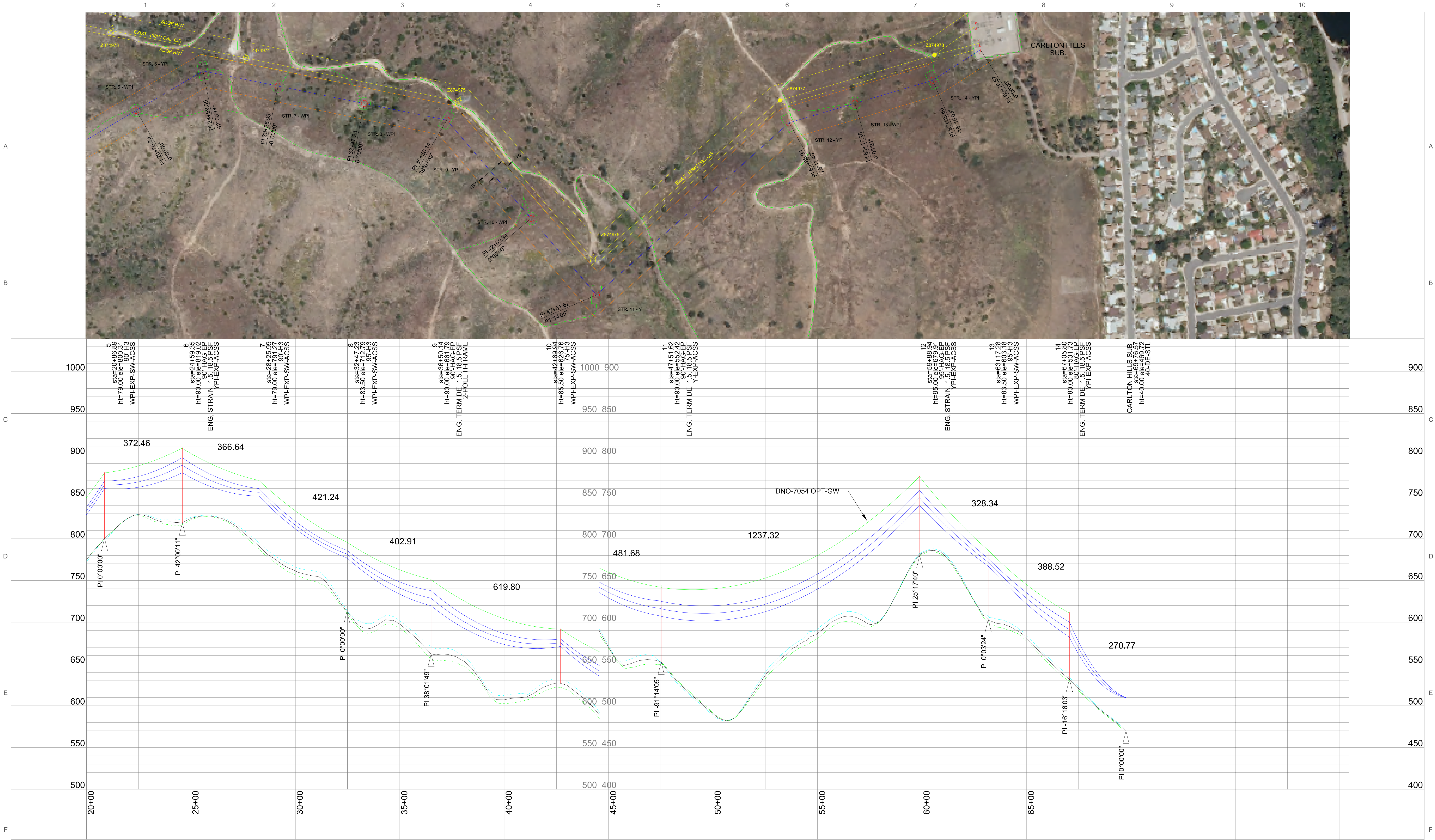


REV. NO.	DATE	DESCRIPTION	BY	CHKD.	APVD.
REVISIONS					
PROPRIETARY NOTICE					

DRN:	
DSN:	
CKD:	
ENG'D:	
STAMPED BY:	
REGISTRATION NO:	
STATE:	
C.O.A.:	
STATE:	



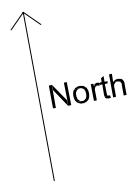
QUAIL BRUSH - CARLTON HILLS
138kV TRANSMISSION LINE
PREFERRED ROUTE



PRELIMINARY

NOTES:

200.0 ft. Horiz. Scale
50.0 ft. Vert. Scale



REV. NO.	DATE	DESCRIPTION	BY	CHKD.	APVD.
REVISIONS					
PROPRIETARY NOTICE					

DRN:	
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ENG'D:	
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REGISTRATION NO:	
STATE:	
C.O.A.:	
STATE:	



QUAIL BRUSH - CARLTON HILLS
138kV TRANSMISSION LINE
PREFERRED ROUTE

ATTACHMENT E
ALTERNATIVE 2A ROUTE



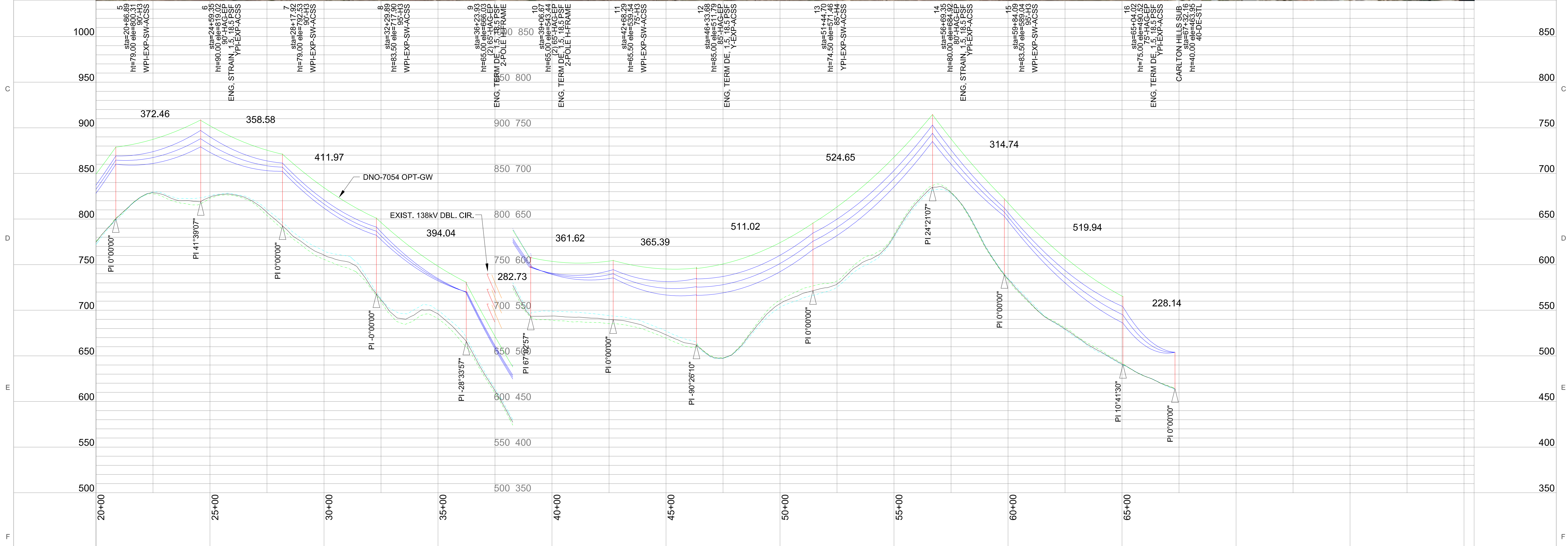
200.0 ft. Horiz. Scale

50.0 ft. Vert. Scale

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REGISTRATION NO:
STATE:
C.O.A.:
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SCALE:	DRAWING NO: QB138-ALT 2a	SHEET 1 of 2
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North

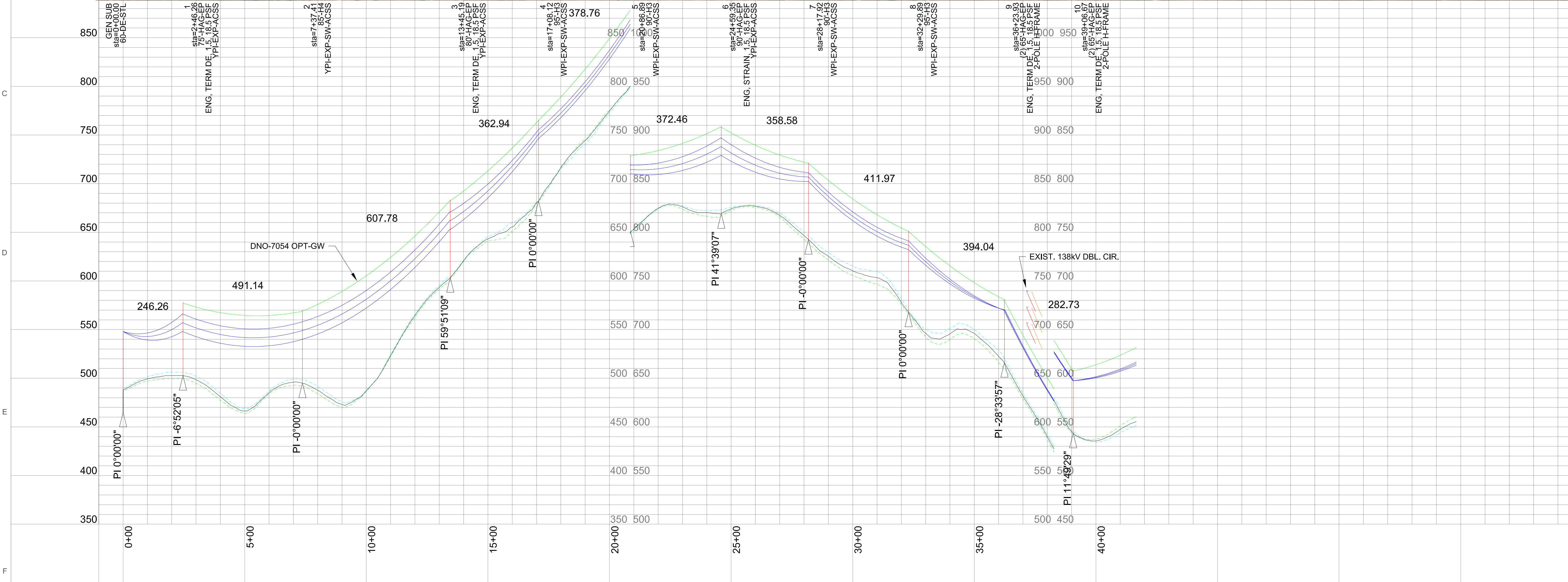
REV. NO.	DATE	DESCRIPTION	EY	CKD.	APVD.
REVISIONS					
PROPRIETARY NOTICE					

DRN:
DSN:
CKD:
ENG'D:
STAMPED BY:
REGISTRATION NO:
STATE:
C.O.A.:
STATE:



SCALE:	DRAWING NO: QB138-ALT 2a	SHEET 2 of 2
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ATTACHMENT F
ALTERNATIVE 2B ROUTE

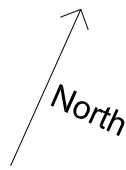


PRELIMINARY

NOTES:

200.0 ft. Horiz. Scale

50.0 ft. Vert. Scale



REV. NO.	DATE	DESCRIPTION	BY	CKD.	APVD.
REVISIONS					
PROPRIETARY NOTICE					

DRN:
DSN:
CKD:
ENG'D:
STAMPED BY:
REGISTRATION NO:
STATE:
C.O.A.:
STATE:



661 RIVER HIGHLANDS BLVD, COVINGTON, LA 70433
PHONE: (985) 809-5240, FAX: (985) 809-5250

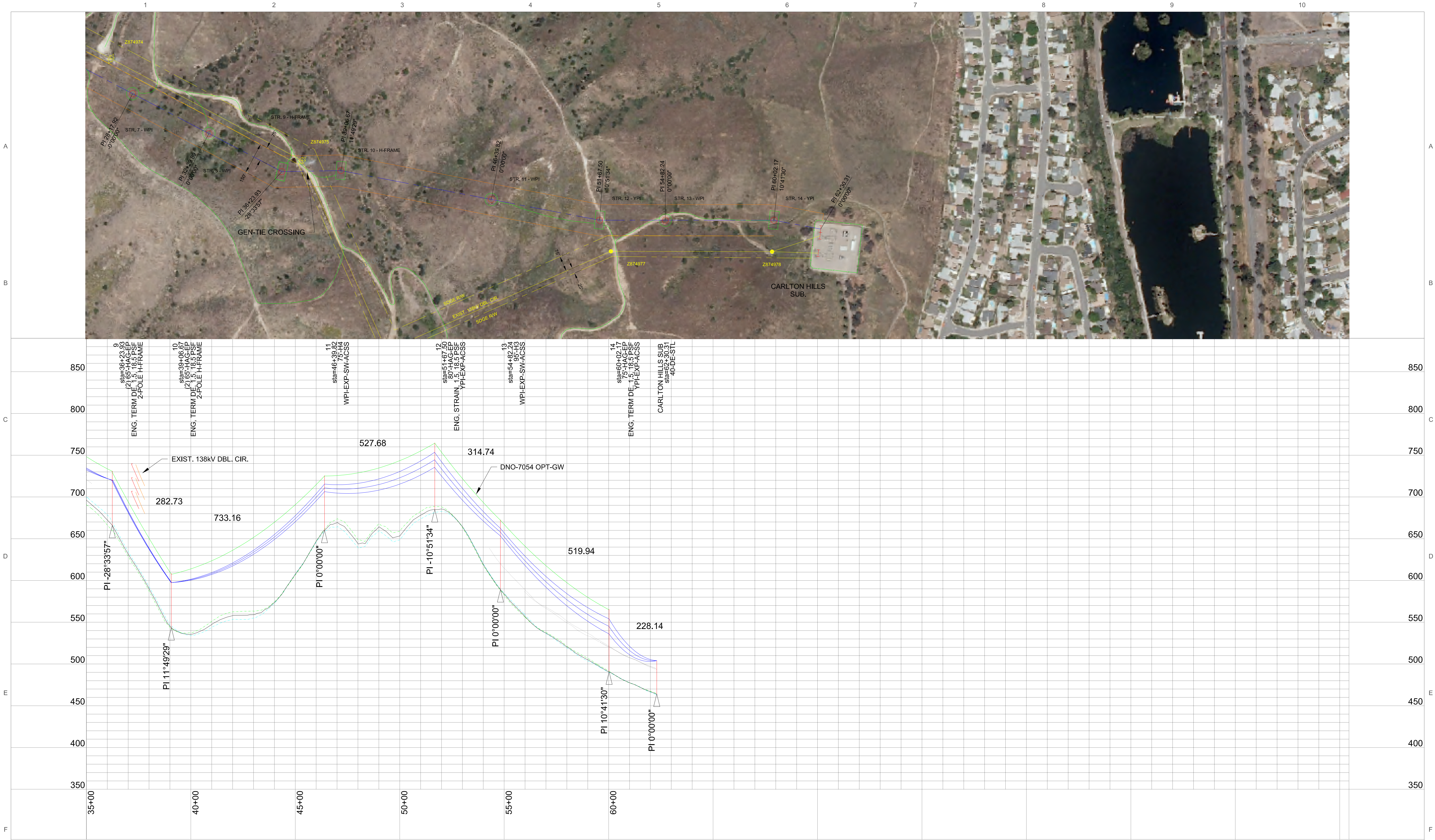
QUAIL BRUSH - CARLTON HILLS
138kV TRANSMISSION LINE
ALTERNATE ROUTE 2b

SCALE:

DRAWING NO:

QB138-ALT 2b

1 of 2



PRELIMINARY

NOTES:

200.0 ft. Horiz. Scale
50.0 ft. Vert. Scale
North

REV. NO.	DATE	DESCRIPTION	BY	CHKD.	APVD.
REVISIONS					
PROPRIETARY NOTICE					

DRN:	
DSN:	
CKD:	
ENG'D:	
STAMPED BY:	
REGISTRATION NO:	
STATE:	
C.O.A.:	
STATE:	

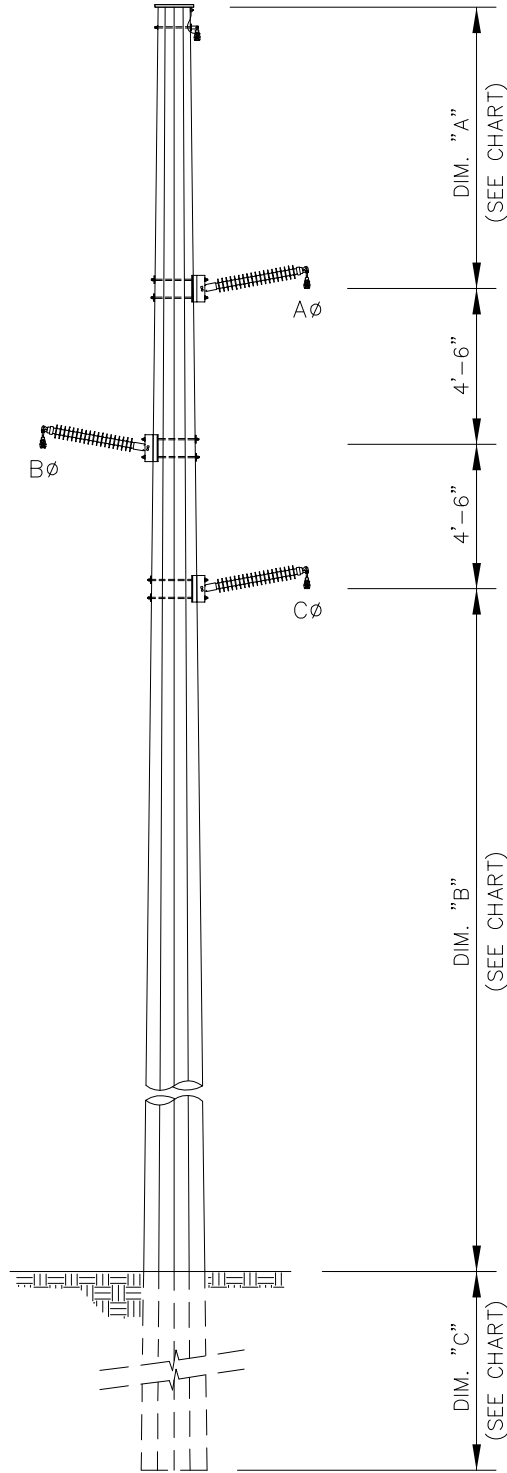


QUAIL BRUSH - CARLTON HILLS
138kV TRANSMISSION LINE
ALTERNATE ROUTE 2b

ATTACHMENT G
PREFERRED ROUTE

STRUCTURE LIST

STR. #	H.A.G.	DIM. "A"	DIM. "B"	DIM. "C"
4	83'-6"	11'-6"	63'-0"	11'-6"
5	79'-0"	11'-6"	58'-6"	11'-0"
7	79'-0"	11'-6"	58'-6"	11'-0"
8	83'-6"	11'-6"	63'-0"	11'-6"
10	65'-6"	13'-6"	43'-0"	9'-6"
13	83'-6"	11'-6"	63'-0"	11'-6"



WPI-EXP-SW

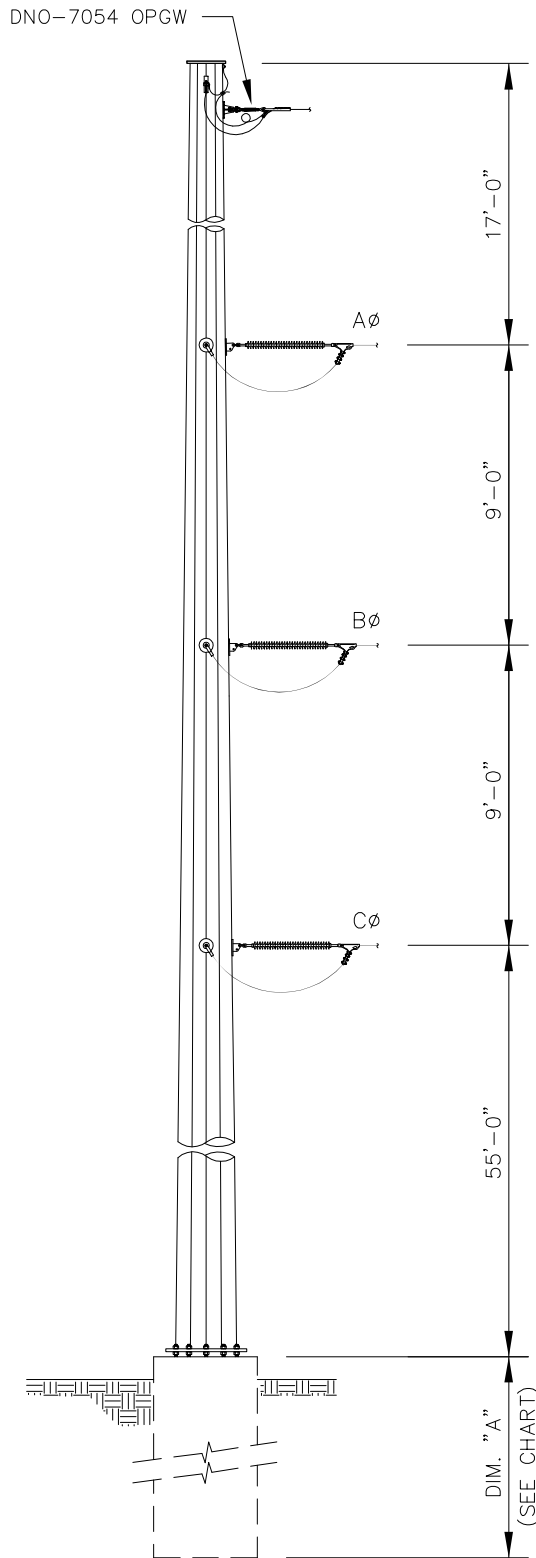
LEGEND:

H.A.G. (HEIGHT ABOVE GROUND)

A 08-23-08 ISSUED FOR APPROVAL REV. NO. DATE DESCRIPTION REVISIONS			AMPIRICAL ENGINEER NAME: KURT TRAUB PHONE: 985-809-5278 CAD FILENAME: CLIENT CHARGE NO:			DRN: MDB DSN: CKD: STAMPED BY: REGISTRATION NO: STATE:			 AMPIRICAL SOLUTIONS LLC		
PROPRIETARY This Drawing is the property of Ampirical Solutions LLC and contains proprietary and confidential information which must not be duplicated, used or disclosed other than expressly authorized by Ampirical Solutions LLC.						QUAIL BRUSH - CARLTON HILLS 138kV TRANSMISSION LINE PREFERRED ROUTE					
SCALE: NONE			DRAWING NO: WPI-EXP-SW-1			REV. 1			SHEET 1 OF 1		

STRUCTURE LIST

STR. #	H.A.G.	DIM. "A"
11	90'-0"	T.B.D.



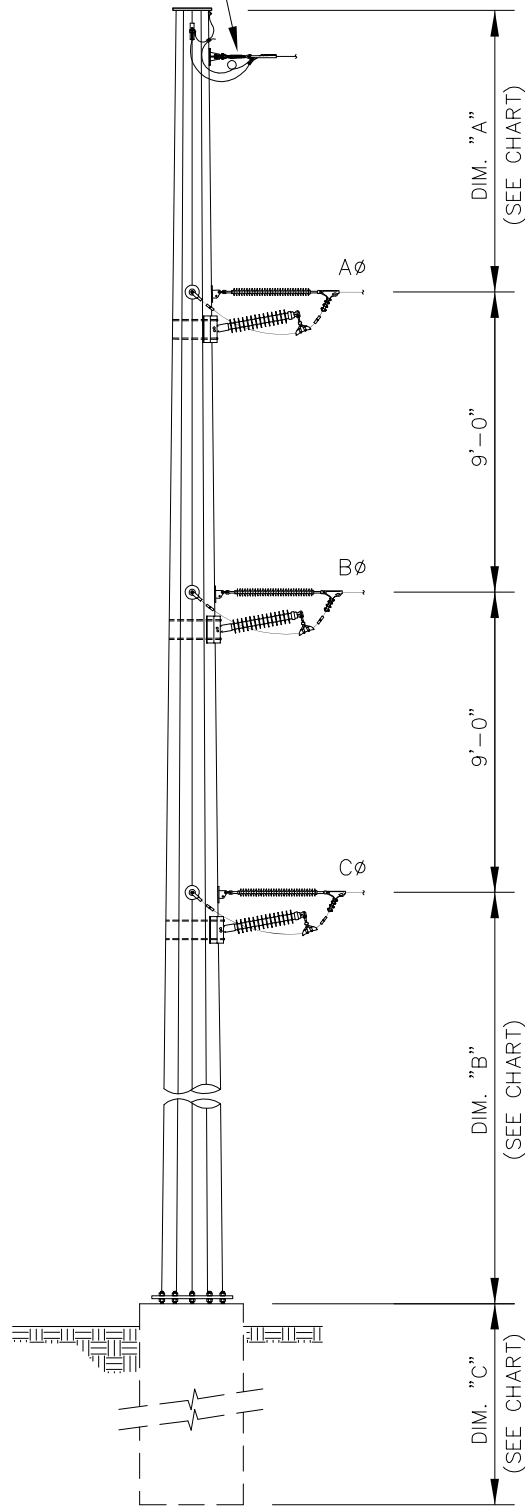
Y-EXP-EP

LEGEND:

H.A.G. (HEIGHT ABOVE GROUND)
T.B.D. (TO BE DETERMINED)

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DNO-7054 OPGW



YPI-EXP-EP

STRUCTURE LIST

STR. #	H.A.G.	DIM. "A"	DIM. "B"	DIM. "C"
1	75'-0"	11'-6"	45'-5"	T.B.D.
3	80'-0"	11'-6"	50'-6"	T.B.D.
6	90'-0"	11'-6"	59'-6"	T.B.D.
9	90'-0"	14'-0"	57'-0"	T.B.D.
12	95'-0"	17'-0"	60'-0"	T.B.D.
14	80'-0"	11'-6"	50'-6"	T.B.D.

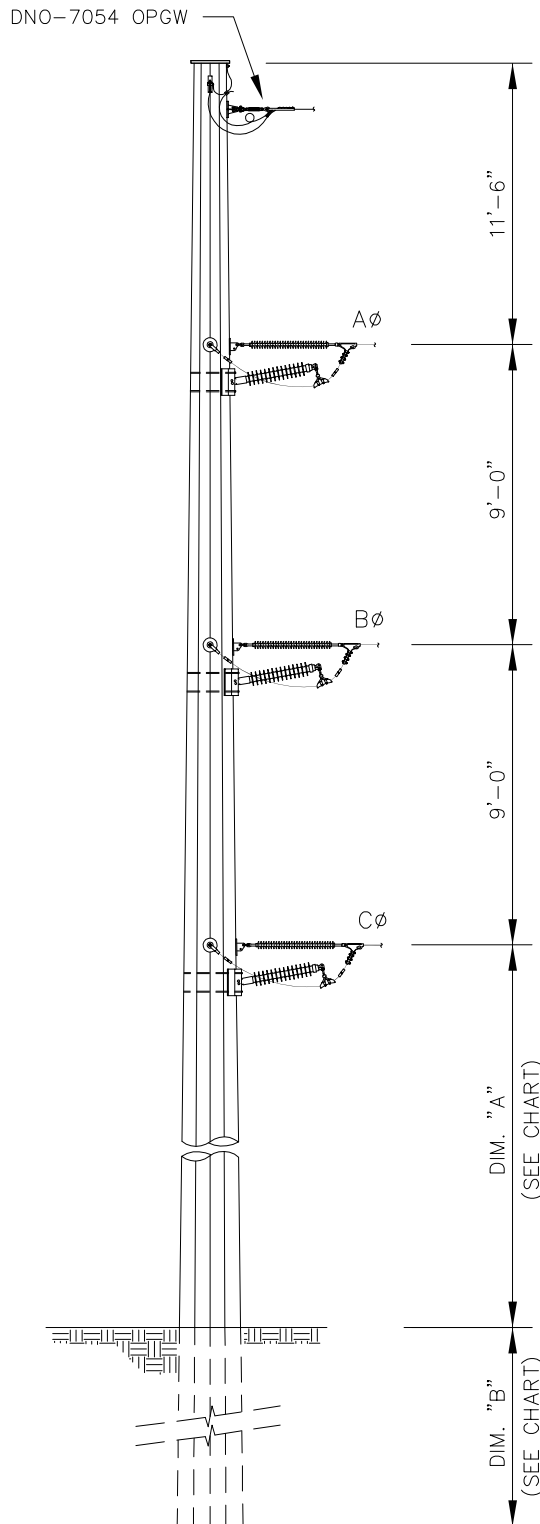
LEGEND:

H.A.G. (HEIGHT ABOVE GROUND)
T.B.D. (TO BE DETERMINED)

A 09-23-08 ISSUED FOR APPROVAL REV. NO. DATE DESCRIPTION			AMPIRICAL ENGINEER NAME: KURT TRAUB PHONE: 985-809-5278 CAD FILENAME: CLIENT CHARGE NO:			DRN: MDB DSN: CKD: STAMPED BY: REGISTRATION NO: STATE:			 AMPIRICAL SOLUTIONS LLC		
REVISIONS			PROPRIETARY This Drawing is the property of Amprical Solutions LLC and contains proprietary and confidential information which must not be duplicated, used or disclosed other than expressly authorized by Amprical Solutions LLC.			QUAIL BRUSH - CARLTON HILLS 138KV TRANSMISSION LINE PREFERRED ROUTE			SCALE: NONE DRAWING NO: YPI-EXP-EP-1 REV. 1 SHEET 1 OF 1		

STRUCTURE LIST

STR. #	H.A.G.	DIM. "A"	DIM. "B"
2	74'-6"	44'-6"	10'-6"



YPI-EXP-SW

LEGEND:

H.A.G. (HEIGHT ABOVE GROUND)

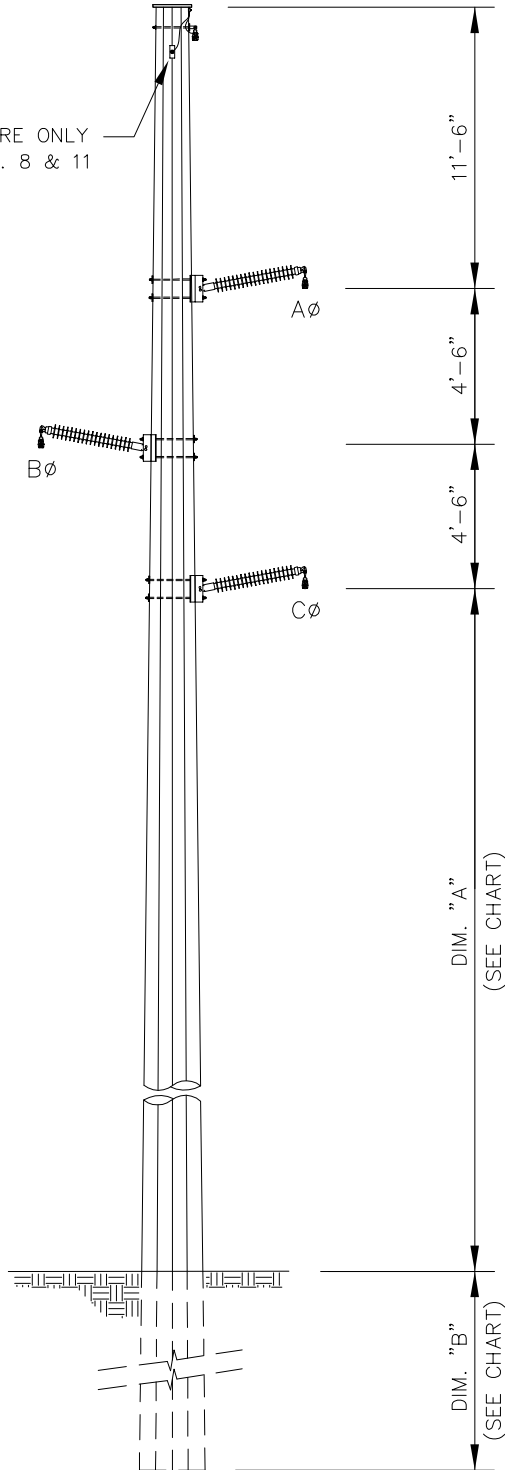
AMPIRICAL ENGINEER NAME: KURT TRAUB PHONE: 985-809-5278 CAD FILENAME: CLIENT CHARGE NO:				DRN: MDB DSN: CKD: STAMPED BY: REGISTRATION NO: STATE:		 AMPIRICAL SOLUTIONS LLC	
PROPRIETARY This Drawing is the property of Ampirical Solutions LLC and contains proprietary and confidential information which must not be duplicated, used or disclosed other than expressly authorized by Ampirical Solutions LLC.							
QUAIL BRUSH - CARLTON HILLS 138KV TRANSMISSION LINE PREFERRED ROUTE				SCALE: NONE		DRAWING NO: YPI-EXP-SW-1	
REV. NO. DATE DESCRIPTION REVISIONS				REV. 1		SHEET 1 OF 1	

ATTACHMENT H
ALTERNATIVE 2A ROUTE DETAIL SHEETS

STRUCTURE LIST

STR. #	H.A.G.	DIM. "A"	DIM. "B"
4	83'-6"	63'-0"	11'-6"
5	79'-0"	58'-6"	11'-0"
7	79'-0"	58'-6"	11'-0"
8	83'-6"	63'-0"	11'-6"
11	65'-6"	45'-0"	9'-6"
15	83'-6"	63'-0"	11'-6"

7#8 SHLD. WIRE ONLY
ON STR. NO. 8 & 11



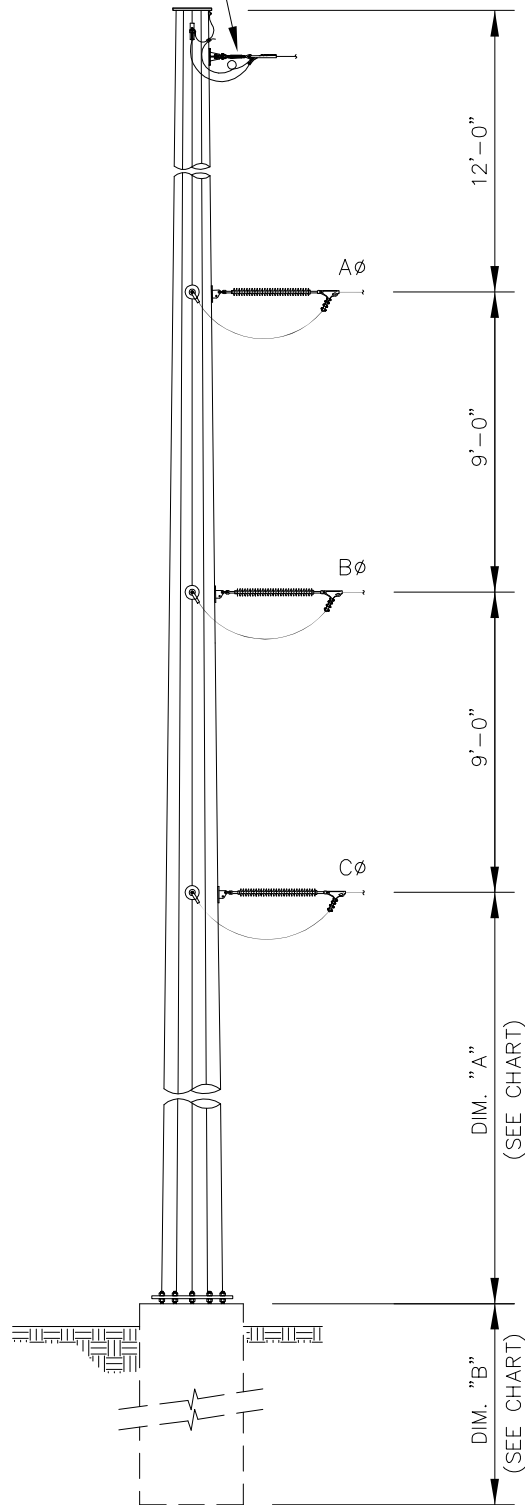
WPI-EXP-SW

LEGEND:

H.A.G. (HEIGHT ABOVE GROUND)

A 09-23-08 ISSUED FOR APPROVAL REV. NO. DATE DESCRIPTION			AMPIRICAL ENGINEER NAME: KURT TRAUB PHONE: 985-809-5278 CAD FILENAME: CLIENT CHARGE NO:			DRN: MDB DSN: CKD: STAMPED BY: REGISTRATION NO: STATE:			 AMPIRICAL SOLUTIONS LLC		
REVISIONS			PROPRIETARY This Drawing is the property of Ampirical Solutions LLC and contains proprietary and confidential information which must not be duplicated, used or disclosed other than expressly authorized by Ampirical Solutions LLC.			QUAIL BRUSH - CARLTON HILLS 138KV TRANSMISSION LINE ALTERNATE ROUTE 2a			SCALE: NONE DRAWING NO: WPI-EXP-SW-2a REV. 1 SHEET 1 OF 1		

DNO-7054 OPGW



Y-EXP-EP

STRUCTURE LIST

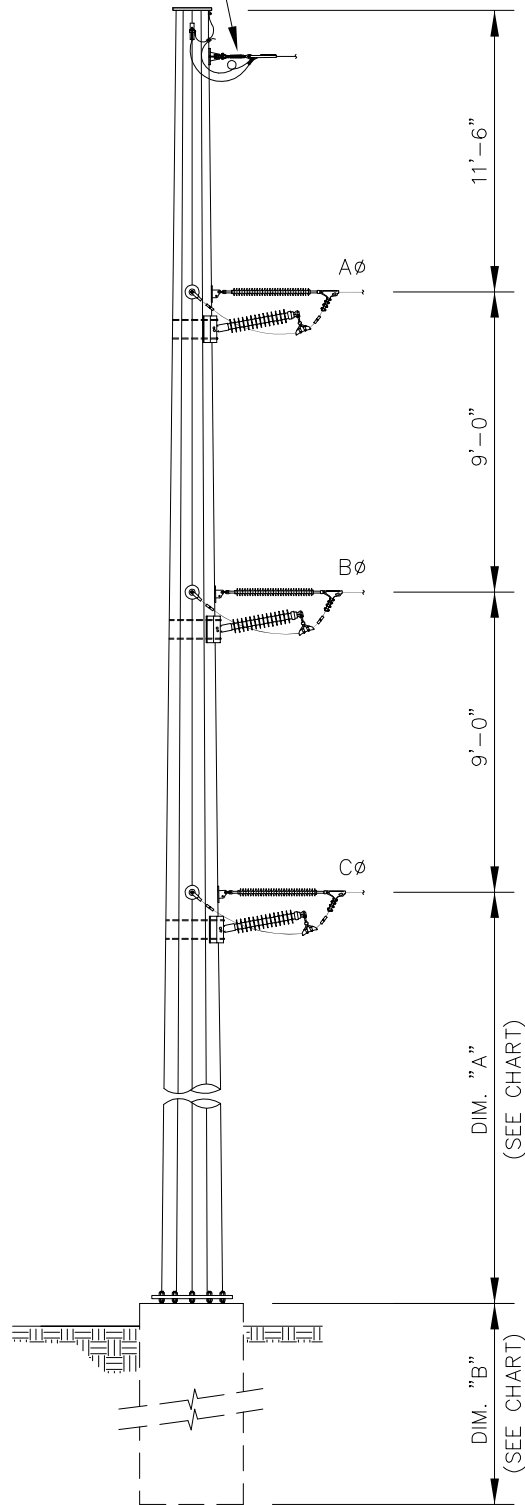
STR. #	H.A.G.	DIM. "A"	DIM. "B"
12	85'-0"	55'-0"	T.B.D.

LEGEND:

H.A.G. (HEIGHT ABOVE GROUND)
T.B.D. (TO BE DETERMINED)

				AMPIRICAL ENGINEER NAME: KURT TRAUB PHONE: 985-809-5278 CAD FILENAME: CLIENT CHARGE NO:				DRN: MDB DSN: CKD: STAMPED BY: REGISTRATION NO: STATE:				 QUAIL BRUSH - CARLTON HILLS 138KV TRANSMISSION LINE ALTERNATE ROUTE 2a			
				PROPRIETARY This Drawing is the property of Ampirical Solutions LLC and contains proprietary and confidential information which must not be duplicated, used or disclosed other than expressly authorized by Ampirical Solutions LLC.											
A 09-23-08 ISSUED FOR APPROVAL REV. NO. DATE DESCRIPTION				MDB KMT MRS BY CKD APVD.				SCALE: NONE DRAWING NO: Y-EXP-EP-2a REV. 1 SHEET 1 OF 1							

DNO-7054 OPGW



YPI-EXP-EP

STRUCTURE LIST

STR. #	H.A.G.	DIM. "A"	DIM. "B"
1	75'-0"	45'-6"	T.B.D.
3	80'-0"	50'-6"	T.B.D.
6	90'-0"	60'-6"	T.B.D.
14	80'-0"	50'-6"	T.B.D.
16	75'-0"	45'-6"	T.B.D.

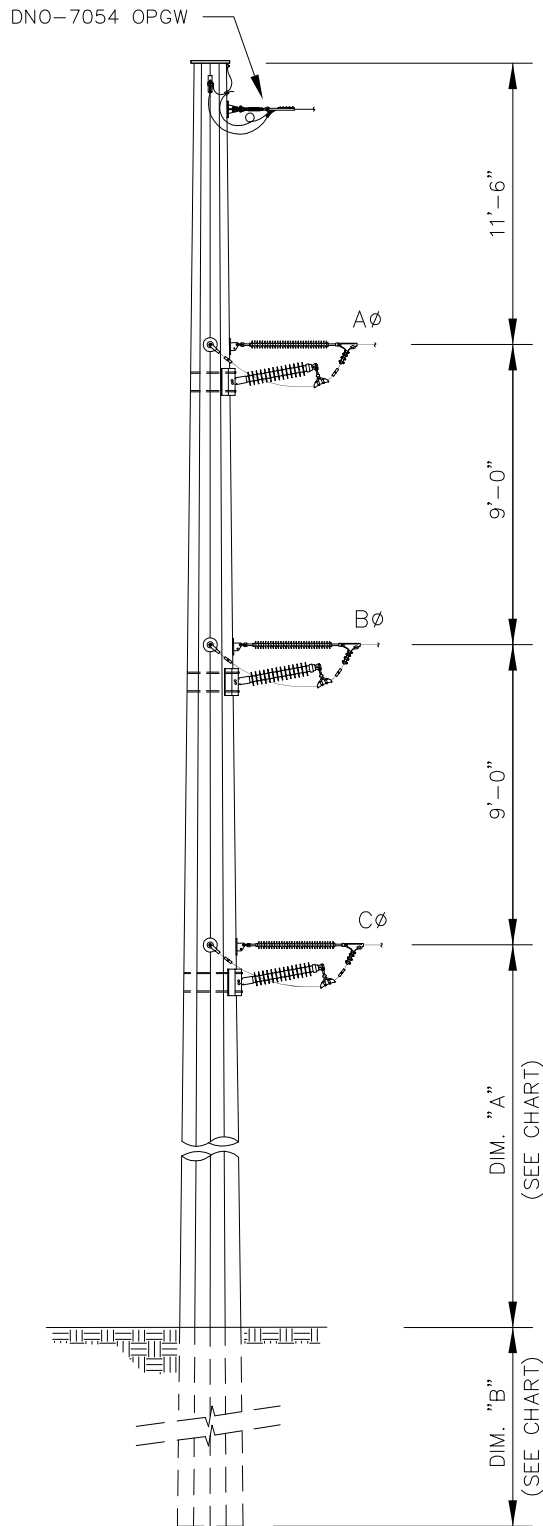
LEGEND:

H.A.G. (HEIGHT ABOVE GROUND)
T.B.D. (TO BE DETERMINED)

				AMPIRICAL ENGINEER NAME: KURT TRAUB PHONE: 985-809-5278 CAD FILENAME: CLIENT CHARGE NO:				DRN: MDB DSN: CKD: STAMPED BY: REGISTRATION NO: STATE:				 QUAIL BRUSH - CARLTON HILLS 138KV TRANSMISSION LINE ALTERNATE ROUTE 2a			
				PROPRIETARY This Drawing is the property of Ampirical Solutions LLC and contains proprietary and confidential information which must not be duplicated, used or disclosed other than expressly authorized by Ampirical Solutions LLC.											
A 08-23-08 ISSUED FOR APPROVAL REV. NO. DATE DESCRIPTION				MDB KMT MRS. BY CKD. APVD.				SCALE: NONE DRAWING NO: YPI-EXP-EP-2a REV. 1 SHEET 1 OF 1							

STRUCTURE LIST

STR. #	H.A.G.	DIM. "A"	DIM. "B"
2	74'-6"	45'-0"	10'-6"
13	74'-6"	45'-0"	10'-6"



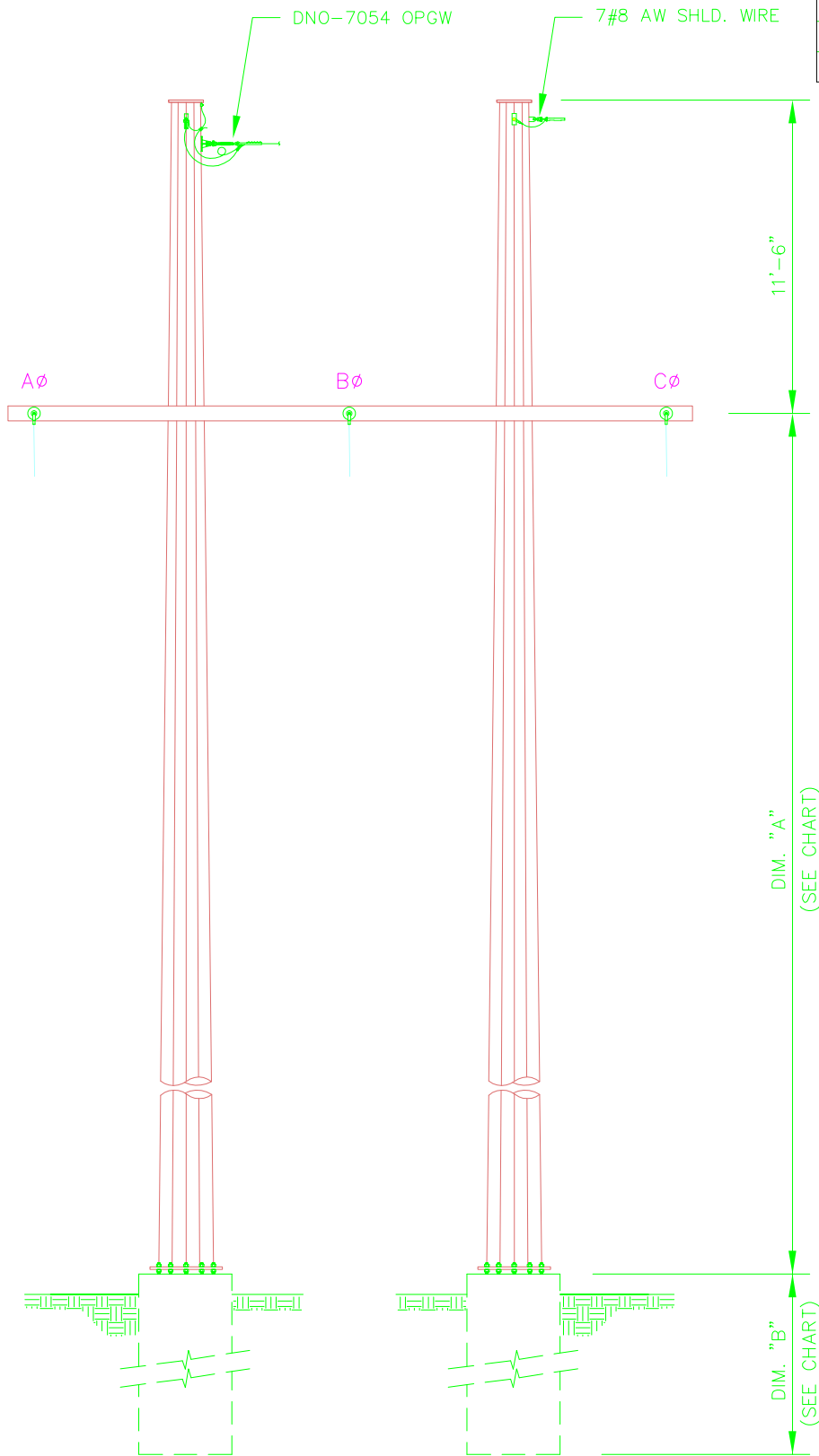
YPI-EXP-SW

LEGEND:

H.A.G. (HEIGHT ABOVE GROUND)

A 09-23-08 ISSUED FOR APPROVAL REV. NO. DATE DESCRIPTION			AMPIRICAL ENGINEER NAME: KURT TRAUB PHONE: 985-809-5278 CAD FILENAME: CLIENT CHARGE NO:			DRN: MDB DSN: CKD: STAMPED BY: REGISTRATION NO: STATE:					
REVISIONS			PROPRIETARY This Drawing is the property of Ampirical Solutions LLC and contains proprietary and confidential information which must not be duplicated, used or disclosed other than expressly authorized by Ampirical Solutions LLC.			QUAIL BRUSH - CARLTON HILLS 138KV TRANSMISSION LINE ALTERNATE ROUTE 2a			SCALE: NONE DRAWING NO: YPI-EXP-SW-2a REV. 1 SHEET 1 OF 1		

ATTACHMENT I
H-FRAME DE



STRUCTURE LIST			
STR. #	H.A.G.	DIM. "A"	DIM. "B"
9	65'-0"	53'-6"	T.B.D.
10	65'-0"	53'-6"	T.B.D.

H-FRAME DE

LEGEND:

H.A.G. (HEIGHT ABOVE GROUND)
T.B.D. (TO BE DETERMINED)

REV. NO.	DATE	DESCRIPTION	BY	CHKD.	APVD.
A	09-23-08	ISSUED FOR APPROVAL			
REVISIONS					

AMPIRICAL ENGINEER		DRN: MDB
NAME: KURT TRAUB		DSN:
PHONE: 985-809-5278		CKD:
CAD FILENAME:		STAMPED BY:
CLIENT CHARGE NO:		REGISTRATION NO:
		STATE:
PROPRIETARY		
This Drawing is the property of Ampirical Solutions LLC and contains proprietary and confidential information which must not be duplicated, used or disclosed other than expressly authorized by Ampirical Solutions LLC.		

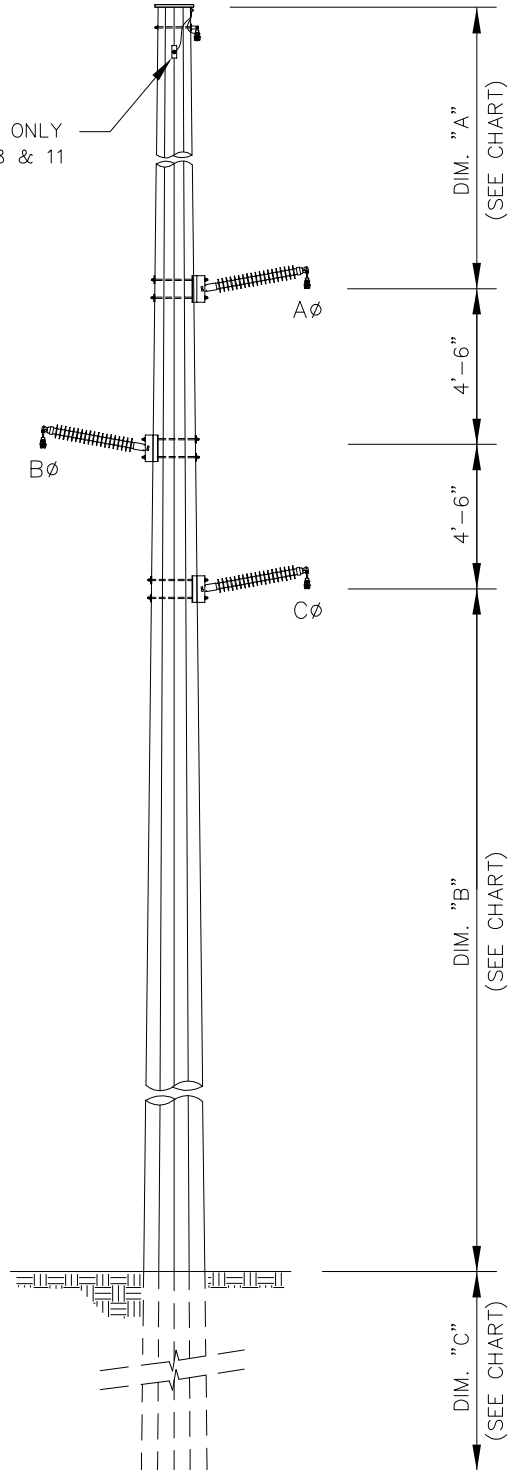
				AMPIRICAL SOLUTIONS LLC			
QUAIL BRUSH - CARLTON HILLS							
138kV TRANSMISSION LINE							
ALTERNATE ROUTE 2a & 2b							
SCALE: NONE		DRAWING NO: H-FRAME DE		REV. 1		SHEET 1 OF 1	

ATTACHMENT J
ALTERNATIVE 2B ROUTE DETAIL SHEETS

STRUCTURE LIST

STR. #	H.A.G.	DIM. "A"	DIM. "B"	DIM. "C"
4	83'-6"	11'-6"	63'-0"	11'-6"
5	79'-0"	11'-6"	58'-6"	11'-0"
7	79'-0"	11'-6"	58'-6"	11'-0"
8	83'-6"	11'-6"	63'-0"	11'-6"
11	70'-0"	16'-6"	44'-5"	10'-0"
13	83'-6"	11'-6"	63'-0"	11'-6"

7#8 SHLD. WIRE ONLY
ON STR. NO. 8 & 11



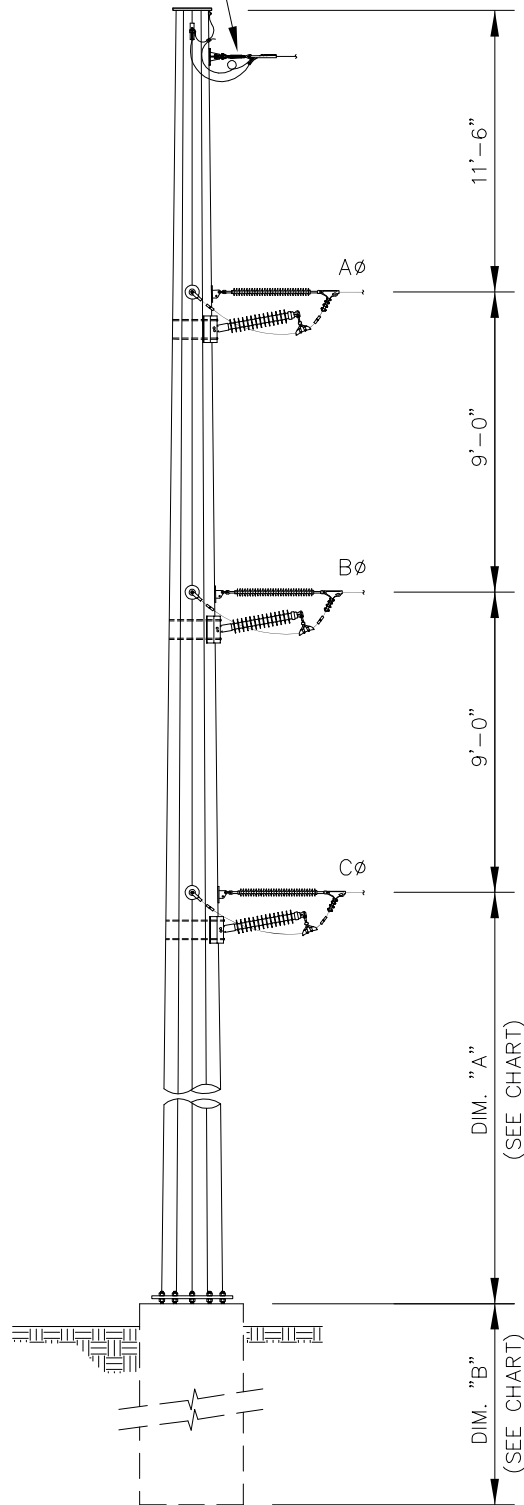
WPI-EXP-SW

LEGEND:

H.A.G. (HEIGHT ABOVE GROUND)

A 09-23-08 ISSUED FOR APPROVAL REV. NO. DATE DESCRIPTION			AMPIRICAL ENGINEER NAME: KURT TRAUB PHONE: 985-809-5278 CAD FILENAME: CLIENT CHARGE NO:			DRN: MDB DSN: CKD: STAMPED BY: REGISTRATION NO: STATE:			 AMPIRICAL SOLUTIONS LLC		
REVISIONS			MDB KMT MRS BY CKD APVD.			PROPRIETARY This Drawing is the property of Amprical Solutions LLC and contains proprietary and confidential information which must not be duplicated, used or disclosed other than expressly authorized by Amprical Solutions LLC.			QUAIL BRUSH - CARLTON HILLS 138KV TRANSMISSION LINE ALTERNATE ROUTE 2b		
SCALE: NONE			DRAWING NO: WPI-EXP-SW-2b			REV. 1			SHEET 1 OF 1		

DNO-7054 OPGW



YPI-EXP-EP

STRUCTURE LIST

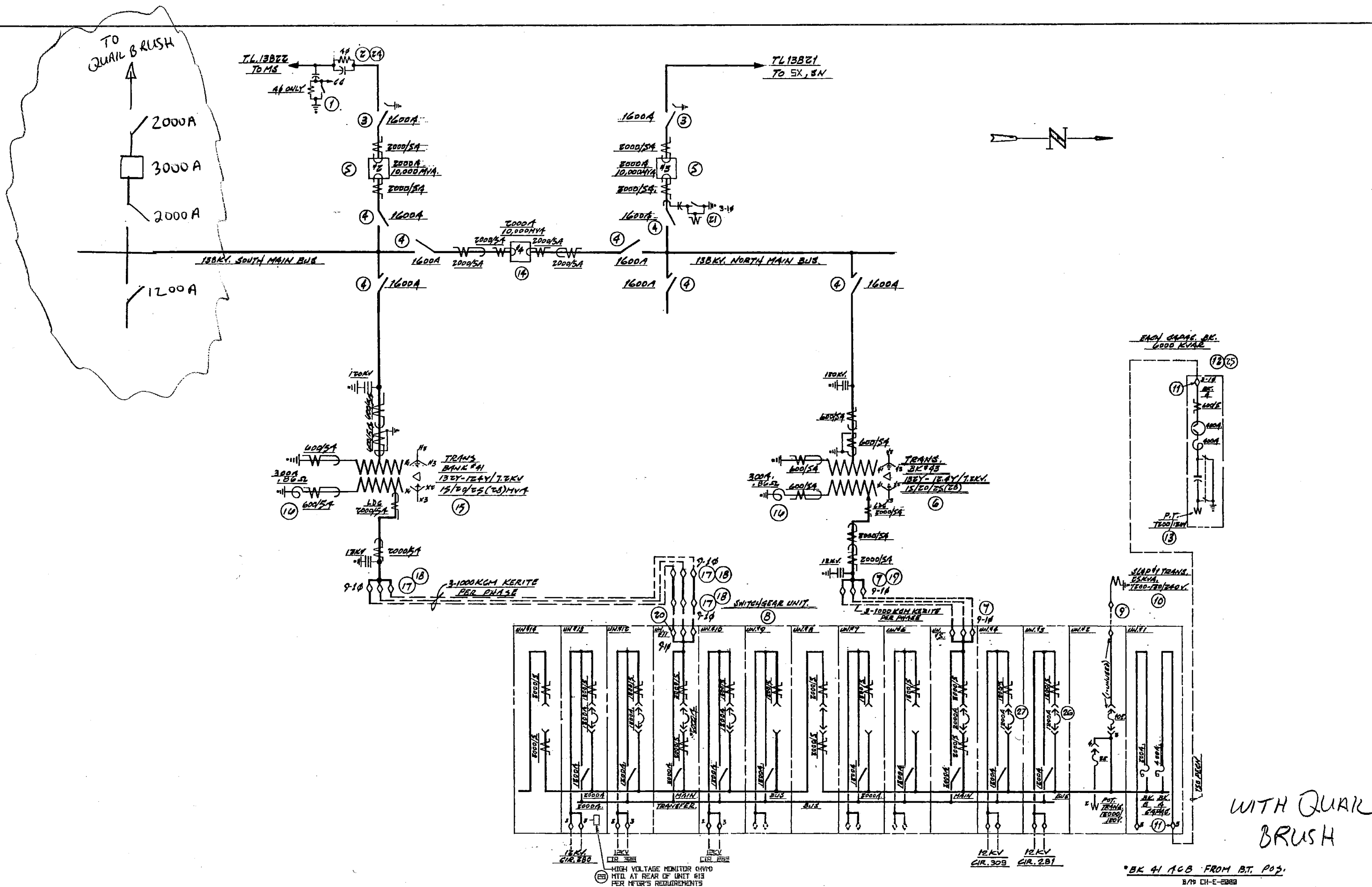
STR. #	H.A.G.	DIM. "A"	DIM. "B"
1	75'-0"	45'-6"	T.B.D.
3	80'-0"	50'-6"	T.B.D.
6	90'-0"	60'-6"	T.B.D.
12	80'-0"	50'-6"	T.B.D.
14	75'-0"	45'-6"	T.B.D.

LEGEND:

H.A.G. (HEIGHT ABOVE GROUND)
T.B.D. (TO BE DETERMINED)

				AMPIRICAL ENGINEER NAME: KURT TRAUB PHONE: 985-809-5278 CAD FILENAME: CLIENT CHARGE NO:				DRN: MDB DSN: CKD: STAMPED BY: REGISTRATION NO: STATE:				 QUAIL BRUSH - CARLTON HILLS 138KV TRANSMISSION LINE ALTERNATE ROUTE 2b			
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A 09-23-08 ISSUED FOR APPROVAL REV. NO. DATE DESCRIPTION				MDB KMT MRS BY CKD APVD.				SCALE: NONE DRAWING NO: YPI-EXP-EP-2b REV. 1 SHEET 1 OF 1							

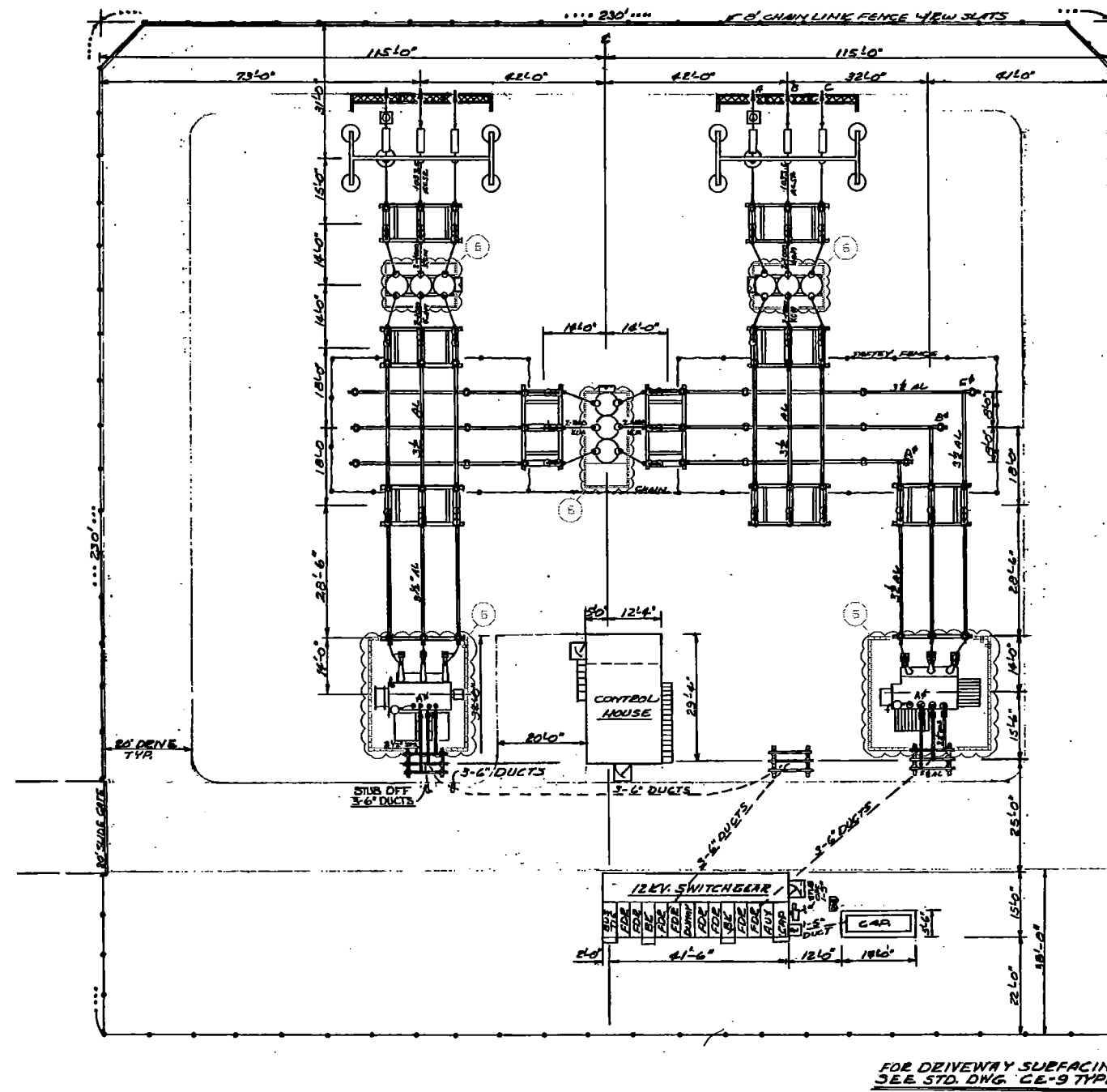
ATTACHMENT K
PRE- AND POST-PROJECT ELECTRICAL ONE-LINE DIAGRAM



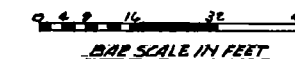
WITH QUAIL
BRUSH

*BK 41 ACB FROM B.T. P.O.
8/74 CH-E-2389

REVISIONS										SAN DIEGO GAS & ELECTRIC COMPANY									
NO.	WORK DONE	DATE	BY	APP'D	NO.	WORK DONE	DATE	BY	APP'D	NO.	WORK DONE	DATE	BY	APP'D	NO.	WORK DONE	DATE	BY	APP'D
1	CHANGED DRAWING NUMBER TO STANDARD NUMBERING SYSTEM																		
2	REVISD PER FIELD CORRECTIONS																		
										CARLTON HILLS SUBSTATION ONE LINE DIAGRAM DRAWN BY: DDM CHECKED BY: MCF APPROVED BY: JLT CAP NO: CH-E-2389									
										DATE: 3/8/75 SCALE: NONE NO. 574892 REV. 1 CH-E-38 PLOT SCALE: 1" = 1'									



BEFORE



WORK DONE					DATE					BY					APP'D					NO.				
3 ADD 2ND XFR & BUS TIE & 3000 KVAR CAPS					12/14/75					LEA					GP					H.D. 5915958				
4 ADD WAVE TRAP & COMP. CAP					6/23/83					OR/LA					DB					H.D. 5952481				
5 ADD PROTECTIVE FENCE					4/11/85					OR/LA					GP					H.D. 5925888				
6 ADDED OIL CONTAINMENT					12/14/83					HP/PEI					NDK					H.D. 5984124				

CARLTON HILLS 138/12KV SUBSTATION

GENERAL ARRANGEMENT

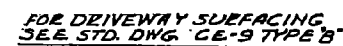
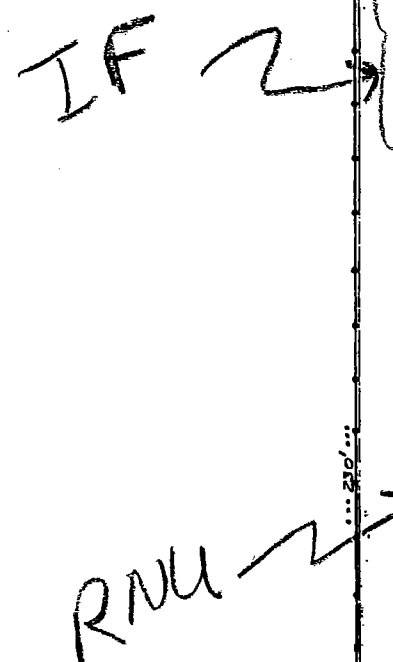
BRANCH BY LOGAN
CHECKED BY GP
APPROVED BY DSP
CUT NO. CH5581

BATD 11/19/75
BATD 11/19/75
BATD 11/19/75

SCALE 1/16"=1'
SCALE 1/16"=1'

NO. 5984124
REV. 5
CH-5-501

Oct 14, 2024 - 10:03:54



With Quail Brush
Tie line

BAR SCALE IN FEET

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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WORK DONE					DATE					BY					APP'D					NO.				
ADD 2ND XTRN & BUS TIE & 3000 KVAR CAP					12/14/75					W.D. 594568					LEA					GP				
ADD WAVE TRAP & COUS. CAP					12/15/75					W.D. 594568					DR/EA					DO				
ADD PROTECTIVE FENCE					12/15/75					W.D. 594568					DR/EA					GP				
ADDN OIL CONTAINMENT					12/15/75					W.D. 594568					DR/EA					HDC				

DRUM BY FLEGMAN

CHECKED BY JEP

APPROVED BY GSP

CAP. NO. 105591

DATE 11/19/75

DATE 11/19/75

DATE 11/19/75

SCALE 1/16"=1'

1 = 15'

NO. 594568

DRUM BY FLEGMAN

CHECKED BY JEP

APPROVED BY GSP

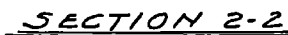
CAP. NO. 105591

CALTON HILLS 138/12KV SUBSTATION

GENERAL ARRANGEMENT

04-5-501

ATTACHMENT L
PRE- AND POST-PROJECT PHYSICAL LAYOUT DRAWINGS



* CAN BE LOCATED ON LV BUSHINGS

Typical Section Views,

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466
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Oct 14, 2003 - 10:05:00