City of Sand Point Council Meeting

Workshop: Tuesday, September 6, 2016 – 2:00 p.m.

Meeting: Tuesday, September 6, 2016 – 7:00 p.m.

CALL TO ORDER

ROLL CALL

CITY OF SAND POINT

(*packet will be available on website September 2, 2016 www.sandpointak.com)*

MAYOR
Mayor Glen Gardner Jr. - Office Exp. 2017

COUNCIL MEMBERS

Danny Cumberlidge	Seat A - Exp. 2016
Allan Starnes	Seat B - Exp. 2017
Shirley Brown	Seat C - Exp. 2016
Jack Foster Jr.	Seat D - Exp. 2017
Marita Gundersen	Seat E - Exp. 2018
Emil Mobeck	Seat F - Exp. 2018

SAND POINT CITY COUNCIL
MEETING AGENDA
CITY CHAMBERS

Regular Meeting **Tuesday, September 6, 2016 7:00 pm**

CALL TO ORDER
ROLL CALL
APPROVAL OF AGENDA
CONSENT AGENDA:

1. Minutes: Minutes of Regular Meeting on August 9, 2016

REPORTS:

1. Finance Officer
2. Administrator
3. DPS Director
4. Fire Chief
5. Public Works Director
6. Harbor Master
7. Student Representative

HEARINGS, ORDINANCES AND RESOLUTIONS:

1. Resolution 16-09: Appointing Election Judges
2. Resolution 16-10: Supporting Aleutian Broadband Project

OLD BUSINESS:

1. Comprehensive Plan Update

NEW BUSINESS:

1. QTT Christmas Potluck Donation Request

PUBLIC COMMENTS
EXECUTIVE SESSION
COUNCIL COMMENTS
ADJOURNMENT

THERE IS A WORKSHOP FOR THIS MEETING AT 2 P.M. – SAME DAY IN CITY CHAMBERS

POSTED: 08/31/16

CALL TO ORDER:
The regular meeting of the Sand Point City Council was held Tuesday, August 9, 2016 in the Sand Point Council Chambers. Mayor Glen Gardner, Jr. called the meeting to order at 7:02 p.m.

ROLL CALL:

Glen Gardner, Jr.	Mayor	Present
Danny Cumberlidge	Seat A	Present
Allan Starnes	Seat B	Absent – excused
Shirley Brown	Seat C	Present
Jack Foster, Jr.	Seat D	Present
Marita Gundersen	Seat E	Present
Emil Mobeck	Seat F	Absent – excused

A quorum was established.

Staff in attendance:
Andy Varner, Administrator
Shannon Sommer, City Clerk
David Stokes, Public Works Director
Richard Kochuten, Sr., Harbor Master
Krista Galvin, Finance Officer

APPROVAL OF AGENDA:
Mayor Glen Gardner, Jr. requested a motion to approve the agenda.
MOTION: Councilperson Marita Gundersen made a motion to adopt the agenda.
SECOND: Councilperson Danny Cumberlidge seconded the motion.
VOTE: Motion passed unanimously.

APPROVAL OF CONSENT AGENDA:
1. Minutes of July 12, 2016 Regular Meeting.

Mayor Glen Gardner, Jr. requested a motion to approve the consent agenda.
MOTION: Councilperson Shirley Brown made a motion to adopt the consent agenda.
SECOND: Councilperson Marita Gundersen seconded the motion.
VOTE: Motion passed unanimously.

REPORTS:
Finance Officer- Krista Galvin
Finance Officer Krista Galvin reported for the month of June 2016 Raw Fish Tax was $78,884.08 and Sales Tax was $80,350.37. She included a revenue and expenditure guideline.

Administrator - Andy Varner
Administrator Andy Varner reported the new police vehicle will need more equipment and decals to be installed and he will bring it to Homer to put on the ferry, the other vehicle bought from Cold Bay will be arriving in Sand Point in the coming week. The Annexations application was submitted. He completed a broadband fiber study RFP for Aleutian Fiber. He attended a sponsored trip to Unalaska by Quintillion, and toured a French fiber optic-laying ship to inspect the ship and get details of the project and was scheduled to meet with TelAlaska community/City internet issues. Geotech drillers dug some boreholes and got sufficient data to continue with the dock design. Sand Point is in queue for DTV, he spoke with Senator Murkowski's office to submit a letter to speed up the process. He asked the Council if September's meeting can be moved to the 1st week of September.

Department of Public Safety - Chief John Lucking, Jr.
Manager of Public Safety John Lucking, Jr.'s report included in the packet.

Public Works Director – David Stokes
Public Works Director David Stokes's reported they responded to 2 fires, towed the fire truck to the City shop, dug 1 grave, hauled water to the City shop, graded roads, pulled the motor out of the fire truck and pulled the rock crusher in the shop to be worked on, replaced the battery and brakes in the 2008 Chevy, replaced the upper and lower frame and changed the oil on a cop car.

Landfill
They cleaned around dumpsters, worked on the incinerator and waited for more parts.

Recycling
They worked on the glass crusher and waited for more parts.

Water and Sewer
Water/Sewer Supervisor Allen Hill's report included in packet.

Harbor Master - Richard Kochuten, Sr.
Harbor Master Richard Kochuten, Sr. reported they made numerous dump runs, they serviced all machinery, they helped a wedding party set up the gear shed with Gehl lifts. The crew helped Building Maintenance Kenneth Spjut haul freight, remove alders and change street lights at the clinic, they changed a plank on a skiff float and delivered used oils to the City shop.

Drew Sparlin thanked the City for using the gear shed for fishermen to patch their nets, and asked if fishermen can be notified in advance if there was an occasion to be held in the gear shed. Councilperson Jack Foster, Jr. stated his opinion. Mayor Gardner will talk with Administrator Varner about defining the use of the gear shed.

HEARINGS, ORDINANCES, AND RESOLUTIONS:

1. Ordinance 2016-04: DPS Fees & Fines Schedule – 2nd Reading

Ordinance 2016-04: DPS Fees & Fines Schedule tabled for discussion during September's meeting and be on the agenda for October's meeting.

OLD BUSINESS: None.

NEW BUSINESS:

1. QTT End of Summer Clean-up Donation Request

MOTION: Councilperson Jack Foster, Jr. made a motion to donate the same as last year, $200 to the QTT End of Summer Clean-up.
SECOND: Councilperson Danny Cumberlidge seconded the motion.
VOTE: Shirley-yes; Marita-no; Jack-yes; Danny-yes.
Motion passed unanimously.

2. FY17 SWAMC Membership

MOTION: Councilperson Shirley Brown made a motion to adopt to renew the FY17 SWAMC Membership.
SECOND: Councilperson Marita Gundersen seconded the motion.
VOTE: Motion passed unanimously.

PUBLIC COMMENTS:
Dick Jacobsen stated the City should look into what is allowed on City easements. He also expressed his feeling for the City to keep up with the drug busts and would appreciate more police involvement. Drew Sparlin expressed his opinion to keep private buildings on properties locked to keep out public.

COUNCIL COMMENTS:
Councilperson Brown asked if the police officers are keeping up with changes of the ATV ordinance that was passed. Mayor Gardner said he will check on that with the Police Department and we can discuss in more detail during a session at the October meeting.

ADJOURNMENT:
MOTION: Councilperson Marita Gundersen made a motion to adjourn.
SECOND: Councilperson Shirley Brown seconded the motion.

The meeting adjourned at 7:43 PM.

_____
Glen Gardner, Jr., Mayor

ATTEST:

_____
Shannon Sommer, City Clerk

CALL TO ORDER:
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Marita Gundersen	Seat E	Present
Emil Mobeck	Seat F	Absent – excused

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_____
Glen Gardner, Jr., Mayor

ATTEST:

_____
Shannon Sommer, City Clerk

REPORTS

FINANCE OFFICER

City of Sand Point
Raw Fish Tax Revenue

	FY11	FY12	FY13	FY14	FY15	FY16	FY17
June	217,340.55	July	98,195.23	156,655.84	121,976.31	110,509.71	129,882.77
July	139,818.08	August	68,242.04	137,107.36	48,575.15	94,822.69	-
August	117,033.81	September	71,393.24	53,307.44	64,362.76	62,297.79	-
September	79,043.91	October	74,240.08	41,610.64	32,213.32	76,878.70	-
October	74,929.24	November	5,675.98	22,386.53	7,214.11	3,770.50	-
November	10,518.19	December	1,305.30	5,337.01	372.97	735.79	-
December	92.61	January	39,379.85	43,650.07	25,670.23	21,798.52	-
January	61,025.94	February	33,190.81	53,363.98	37,309.68	47,098.16	-
February	80,458.14	March	78,691.30	65,073.23	88,220.14	69,354.74	-
March	103,148.90	April	24,930.11	36,514.38	15,613.35	23,493.50	-
April	29,908.61	May	16,846.94	21,292.12	25,246.23	16,091.74	-
May	26,019.65	June	129,015.93	64,462.43	68,319.25	78,884.08	-
Total	**939,337.63**		**641,106.81**	**700,761.03**	**535,093.50**	**605,735.92**	**129,882.77**

Sales Tax Revenue

	FY11	FY12	FY13	FY14	FY15	FY16	FY17
June	96,304.83	July	101,206.98	82,934.73	104,201.30	88,780.27	74,972.73
July	98,121.00	August	76,571.79	73,136.15	88,102.34	92,491.15	-
August	77,436.07	September	194,900.07	75,647.72	116,436.20	95,569.47	-
September	89,882.29	October	85,720.47	69,251.83	81,510.79	71,821.64	-
October	93,787.49	November	90,575.50	46,816.20	43,535.59	35,841.10	-
November	34,431.36	December	44,723.29	52,116.25	44,980.97	48,357.80	-
December	59,315.91	January	62,428.48	80,977.40	66,575.33	60,942.89	-
January	72,690.48	February	57,547.22	84,035.36	69,895.86	60,702.43	-
February	68,392.21	March	75,307.36	126,325.95	105,731.28	81,364.98	-
March	83,181.02	April	65,117.67	86,407.71	58,562.79	53,394.08	-
April	72,659.25	May	58,775.64	70,189.92	52,976.00	44,528.77	-
May	56,084.05	June	80,381.46	98,758.26	96,824.06	80,350.37	-
Total	**902,285.96**		**993,255.93**	**946,597.48**	**929,332.51**	**814,144.95**	**74,972.73**
				TDX Fines	(150,000.00)		
					779,332.51		

City of Sand Point
Bank Balance
Date

Bank	Account Number	Balance Date End of July	Balance Date 9/1/2016
Key Bank	50-20-500-0025757	1,798,549.78	1,799,000.62
Wells Fargo - General	4121344139	281,968.75	343,084.26
Wells Fargo - Bingo Fund	4121344147	289,088.07	306,988.69
Wells Fargo - Silver Salmon Fund	4121344154	23,631.34	23,631.34
AlaskaUsa Federal Credit Union CD	1957756	603,687.35	604,146.23

CITY OF SAND POINT
*Expenditure Guideline-No Enc Sum©

Current Period: JULY 16-17

	16-17 YTD Budget	16-17 YTD Amt	JULY MTD Amt	16-17 YTD Balance	% of YTD
GENERAL FUND					
LEGISLATIVE	$131,800.00	$5,128.83	$5,128.83	$126,671.17	3.89%
ADMINISTRATION	$973,560.00	$218,246.62	$218,246.62	$755,313.38	22.42%
PARKS AND RECREATION	$25,500.00	$2,548.83	$2,548.83	$22,951.17	10.00%
PUBLIC SAFETY	$528,000.00	$39,237.79	$39,237.79	$488,762.21	7.43%
PUBLIC WORKS	$614,600.00	$37,705.06	$37,705.06	$576,894.94	6.13%
FACILITIES	$326,350.00	$15,681.68	$15,681.68	$310,668.32	4.81%
Total GENERAL FUND	$2,599,810.00	$318,548.81	$318,548.81	$2,281,261.19	12.25%
BINGO FUND					
ADMINISTRATION	$513,600.00	$82,174.68	$82,174.68	$431,425.32	16.00%
Total BINGO FUND	$513,600.00	$82,174.68	$82,174.68	$431,425.32	16.00%
SILVER SALMON DERBY					
FIRE	$18,750.00	$0.00	$0.00	$18,750.00	0.00%
Total SILVER SALMON DERBY	$18,750.00	$0.00	$0.00	$18,750.00	0.00%
CLINIC OPERATIONS/MAINTENANCE					
ADMINISTRATION	$32,777.00	$0.00	$0.00	$32,777.00	0.00%
Total CLINIC OPERATIONS/MAINTENANCE	$32,777.00	$0.00	$0.00	$32,777.00	0.00%
WATER/SEWER OPERATIONS					
WATER/SEWER	$284,000.00	$12,901.77	$12,901.77	$271,098.23	4.54%
Total WATER/SEWER OPERATIONS	$284,000.00	$12,901.77	$12,901.77	$271,098.23	4.54%
HARBOR/PORT OPERATIONS					
HARBOR	$556,750.00	$36,893.33	$36,893.33	$519,856.67	6.63%
Total HARBOR/PORT OPERATIONS	$556,750.00	$36,893.33	$36,893.33	$519,856.67	6.63%
REFUSE COLLECTION					
PUBLIC WORKS	$145,850.00	$13,457.95	$13,457.95	$132,392.05	9.23%
Total REFUSE COLLECTION	$145,850.00	$13,457.95	$13,457.95	$132,392.05	9.23%
Report Total	$4,151,537.00	$463,976.54	$463,976.54	$3,687,560.46	11.18%

CITY OF SAND POINT
*Revenue Guideline-Alt Code©

Current Period: JULY 16-17

		16-17 YTD Budget	16-17 YTD Amt	JULY MTD Amt	16-17 YTD Balance	% of YTD
GENERAL FUND						
Active	R 01-201 INTEREST INCOME	$4,500.00	$863.29	$863.29	$3,636.71	19.18%
Active	R 01-202 FINES AND PENALTYS	$0.00	$271.95	$271.95	-$271.95	0.00%
Active	R 01-203 OTHER REVENUE	$45,000.00	$274.65	$274.65	$44,725.35	0.61%
Active	R 01-205 4% SALES TAX	$850,000.00	$80,035.88	$80,035.88	$769,964.12	9.42%
Active	R 01-213 RAW FISH TAX	$620,000.00	$78,884.08	$78,884.08	$541,115.92	12.72%
Active	R 01-214 FINE-LATE SALES TAX	$1,000.00	$0.00	$0.00	$1,000.00	0.00%
Active	R 01-217 7% B & B Tax	$16,500.00	$1,629.26	$1,629.26	$14,870.74	9.87%
Active	R 01-225 PAYMENT IN LIEU OF TAX	$150,000.00	$0.00	$0.00	$150,000.00	0.00%
Active	R 01-226 EVENT COSTS	$4,500.00	$0.00	$0.00	$4,500.00	0.00%
Active	R 01-230 DONATIONS	$0.00	$0.00	$0.00	$0.00	0.00%
Active	R 01-231 INSURANCE REFUND	$0.00	$0.00	$0.00	$0.00	0.00%
Active	R 01-233 BUSINESS LIC. FEE	$4,000.00	$0.00	$0.00	$4,000.00	0.00%
Active	R 01-234 SB 46 PERS RELIEF	$30,000.00	$0.00	$0.00	$30,000.00	0.00%
Active	R 01-238 ANCHORAGE OFFICE	$20,000.00	$0.00	$0.00	$20,000.00	0.00%
Active	R 01-250 STATE REVENUE SHARIN	$87,060.00	$89,751.00	$89,751.00	-$2,691.00	103.09%
Active	R 01-256 REVENUE--STATE OF ALA	$7,500.00	$0.00	$0.00	$7,500.00	0.00%
Active	R 01-260 STATE BUSINESS LICENS	$3,500.00	$0.00	$0.00	$3,500.00	0.00%
Active	R 01-265 STATE PROCESSORS TAX	$35,000.00	$0.00	$0.00	$35,000.00	0.00%
Active	R 01-266 ExT FISH TAX SHARING	$250,000.00	$0.00	$0.00	$250,000.00	0.00%
Active	R 01-285 EQUIPMENT RENTAL	$15,000.00	$0.00	$0.00	$15,000.00	0.00%
Active	R 01-291 BUILDING RENTALS	$135,000.00	$2,850.00	$2,850.00	$132,150.00	2.11%
Active	R 01-293 LIBRARY GRANT	$4,200.00	$0.00	$0.00	$4,200.00	0.00%
Active	R 01-297 POLICE MISC REVENUE	$60,000.00	$0.00	$0.00	$60,000.00	0.00%
Active	R 01-298 EMS MISC REVENUE	$500.00	$0.00	$0.00	$500.00	0.00%
	Total	$2,343,260.00	$254,560.11	$254,560.11	$2,088,699.89	10.86%
	Total GENERAL FUND	$2,343,260.00	$254,560.11	$254,560.11	$2,088,699.89	10.86%
BINGO FUND						
Active	R 02-294 BINGO REVENUE	$45,000.00	$5,703.00	$5,703.00	$39,297.00	12.67%
Active	R 02-295 PULL TAB REVENUE	$500,000.00	$91,162.00	$91,162.00	$408,838.00	18.23%
	Total	$545,000.00	$96,865.00	$96,865.00	$448,135.00	17.77%
	Total BINGO FUND	$545,000.00	$96,865.00	$96,865.00	$448,135.00	17.77%
SILVER SALMON DERBY						
Active	R 03-230 DONATIONS	$500.00	$0.00	$0.00	$500.00	0.00%
Active	R 03-292 SILVER SALMON DERBY	$22,000.00	$0.00	$0.00	$22,000.00	0.00%
	Total	$22,500.00	$0.00	$0.00	$22,500.00	0.00%
	Total SILVER SALMON DERBY	$22,500.00	$0.00	$0.00	$22,500.00	0.00%
CLINIC OPERATIONS/MAINTENANCE						
Active	R 10-257 REVENUE--FEDERAL GOV	$32,777.00	$2,731.39	$2,731.39	$30,045.61	8.33%
	Total	$32,777.00	$2,731.39	$2,731.39	$30,045.61	8.33%
	Total CLINIC OPERATIONS/MAINTENANCE	$32,777.00	$2,731.39	$2,731.39	$30,045.61	8.33%
WATER/SEWER OPERATIONS						
Active	R 61-202 FINES AND PENALTYS	$2,500.00	$81.02	$81.02	$2,418.98	3.24%
Active	R 61-206 WATER/SEWER REVENUE	$180,000.00	$18,303.75	$18,303.75	$161,696.25	10.17%
Active	R 61-235 TRANSFER IN	$52,500.00	$0.00	$0.00	$52,500.00	0.00%
Active	R 61-243 USDA GRANT REVENUE	$49,000.00	$0.00	$0.00	$49,000.00	0.00%

CITY OF SAND POINT
*Revenue Guideline-Alt Code©

Current Period: JULY 16-17

		16-17 YTD Budget	16-17 YTD Amt	JULY MTD Amt	16-17 YTD Balance	% of YTD
	Total	$284,000.00	$18,384.77	$18,384.77	$265,615.23	6.47%
	Total WATER/SEWER OPERATIONS	$284,000.00	$18,384.77	$18,384.77	$265,615.23	6.47%
HARBOR/PORT OPERATIONS						
Active	R 62-201 INTEREST INCOME	$4,000.00	$239.67	$239.67	$3,760.33	5.99%
Active	R 62-203 OTHER REVENUE	$0.00	$0.00	$0.00	$0.00	0.00%
Active	R 62-210 HARBOR/MOORAGE	$210,000.00	$18,879.72	$18,879.72	$191,120.28	8.99%
Active	R 62-211 HARBOR/TRAVELLIFT	$90,000.00	$15,381.56	$15,381.56	$74,618.44	17.09%
Active	R 62-212 BOAT HARBOR/RENTS	$100,000.00	$1,181.40	$1,181.40	$98,818.60	1.18%
Active	R 62-215 HARBOR/WHARFAGE	$65,000.00	$462.44	$462.44	$64,537.56	0.71%
Active	R 62-219 HARBOR ELEC SERVICE F	$8,000.00	$712.17	$712.17	$7,287.83	8.90%
Active	R 62-220 HARBOR/ELEC DEPOSIT	$2,000.00	$0.00	$0.00	$2,000.00	0.00%
Active	R 62-221 HARBOR/VAN STORAGE	$20,000.00	$0.00	$0.00	$20,000.00	0.00%
Active	R 62-222 HARBOR/STALL ELECTRIC	$35,000.00	$2,566.77	$2,566.77	$32,433.23	7.33%
Active	R 62-223 HARBOR/ELECTRICITY	$4,000.00	$583.91	$583.91	$3,416.09	14.60%
Active	R 62-224 GEARSHED LOCKER REN	$15,000.00	$600.00	$600.00	$14,400.00	4.00%
Active	R 62-237 HARBOR STORAGE	$5,000.00	$0.00	$0.00	$5,000.00	0.00%
Active	R 62-285 EQUIPMENT RENTAL	$25,000.00	$3,393.90	$3,393.90	$21,606.10	13.58%
	Total	$583,000.00	$44,001.54	$44,001.54	$538,998.46	7.55%
	Total HARBOR/PORT OPERATIONS	$583,000.00	$44,001.54	$44,001.54	$538,998.46	7.55%
REFUSE COLLECTION						
Active	R 65-202 FINES AND PENALTYS	$1,500.00	$46.07	$46.07	$1,453.93	3.07%
Active	R 65-204 REFUSE COLLECTION	$145,000.00	$14,103.05	$14,103.05	$130,896.95	9.73%
	Total	$146,500.00	$14,149.12	$14,149.12	$132,350.88	9.66%
	Total REFUSE COLLECTION	$146,500.00	$14,149.12	$14,149.12	$132,350.88	9.66%
	Report Total	$3,957,037.00	$430,691.93	$430,691.93	$3,526,345.07	10.88%

CITY OF SAND POINT

*Fund Summary - Budget to Actual©

JULY 16-17

	16-17 YTD Budget	JULY MTD Amount	16-17 YTD Amount	16-17 YTD Balance	16-17 % YTD Budget
FUND 01 GENERAL FUND					
Revenue	$2,343,260.00	$254,560.11	$254,560.11	$2,088,699.89	10.86%
Expenditure	$2,599,810.00	$318,548.81	$318,548.81	$2,281,261.19	12.25%
		-$63,988.70	-$63,988.70		
FUND 02 BINGO FUND					
Revenue	$545,000.00	$96,865.00	$96,865.00	$448,135.00	17.77%
Expenditure	$513,600.00	$82,174.68	$82,174.68	$431,425.32	16.00%
		$14,690.32	$14,690.32		
FUND 03 SILVER SALMON DERBY					
Revenue	$22,500.00	$0.00	$0.00	$22,500.00	0.00%
Expenditure	$18,750.00	$0.00	$0.00	$18,750.00	0.00%
		$0.00	$0.00		
FUND 10 CLINIC OPERATIONS/MAINTENANCE					
Revenue	$32,777.00	$2,731.39	$2,731.39	$30,045.61	8.33%
Expenditure	$32,777.00	$0.00	$0.00	$32,777.00	0.00%
		$2,731.39	$2,731.39		
FUND 61 WATER/SEWER OPERATIONS					
Revenue	$284,000.00	$18,384.77	$18,384.77	$265,615.23	6.47%
Expenditure	$284,000.00	$12,901.77	$12,901.77	$271,098.23	4.54%
		$5,483.00	$5,483.00		
FUND 62 HARBOR/PORT OPERATIONS					
Revenue	$583,000.00	$44,001.54	$44,001.54	$538,998.46	7.55%
Expenditure	$556,750.00	$36,893.33	$36,893.33	$519,856.67	6.63%
		$7,108.21	$7,108.21		
FUND 65 REFUSE COLLECTION					
Revenue	$146,500.00	$14,149.12	$14,149.12	$132,350.88	9.66%
Expenditure	$145,850.00	$13,457.95	$13,457.95	$132,392.05	9.23%
		$691.17	$691.17		
Report Total		-$33,284.61	-$33,284.61		

TO: Mayor Gardner
City Council Members

FROM: Andy Varner
City Administrator

DATE: August 31, 2016

SUBJ: Monthly Report for September 2016

Thanks for accommodating me in moving up this meeting, my family was thrilled to be here for the salmon derby. Here are a few of the items we've been working on since the last report.

AIRPORT

- Good news with the airport. The Mayor, Danny Seybert, and I met with the DOT commissioner and Deputy Commissioner of Aviation when Glen was in town a couple weeks ago. We came to an agreement that PenAir will contract with a Part 139 fire responder for a 2 year trial period, after which time those responsibilities will shift back to DOT picking up the bill. DOT is still trying to secure a separate ARFF truck for the airport and have it on the last ferry. If things go well the airport could be certified this fall.

ANNEXATION

- I spoke to the LBC last week, they're getting ready to publish a public notice that the petition has been accepted and we'll begin the next steps soon.

INTERNET & BROADBAND

- The "A-Team" received 9 responses to our Aleutian Broadband feasibility RFP on August 19, and I was on the review team. I am also leading the negotiations with the consultant, and we're negotiating with the top firm right now to perform the study looking at broadband and fiber options for the region. The final document will be due at the end of the year. The resolution on this agenda pertains to this project.
- I met with 7 people between TelAlaska and TexRUs to sort out some internet issues both in our City accounts and for community internet through TelAlaska too. They are researching some cost saving options for our city services.

CODE UPDATE

- With DPS Manager Lucking out of the office on vacation, we decided we would pick up the code revision discussion again after this Council meeting. Our attorney Patrick Munson did incorporate some of our suggested changes into the draft ordinance, including several more minor offenses that are found throughout the various sections (Harbor, Water/Sewer, Planning, etc). We will proceed with the "stepped" approach to fines, ranging from $100-$500 based on the severity of the offense.

DOCK REPLACEMENT

- The design is 65% complete (see FYI).

AUDIT

- Irina was out here all last week assisting us with preparing for the audit which is scheduled later this month. She also worked with the Mayor in writing off over $100,000 in receivables.

DIGITAL TV UPGRADE

- Senator Murkowski's staff is working on it, I've spoken to a staffer in DC a couple times about this problem. It may be a simple issue between the FCC and FAA not talking to one another, and FAA just needs to provide some antennae information to move ahead. I'm working on it.

NEW HARBOR FLOAT DESIGN

- I'm meeting with the Borough next week to discuss the scope and timeline for the Harbor float design completion project.

EASEMENTS

- Brooks had this to say regarding pot storage in the road easements:

  "Storage of private property in a public easement is not legal. Those storing pots in easements are trespassing. The correct reaction is to provide them a notice requiring removal of their property from the easement in 30 days. Hopefully that will do the trick but if not the City can then send a second letter informing them the property will be impounded and removed at their expense."

  At this time I am not recommending any action, as this is likely a sensitive issue. I think the Council should have a discussion first about how and if we want to proceed.

JOHN H. LUCKING, JR
CHIEF OF POLICE

SAND POINT
DEPARTMENT of PUBLIC SAFETY

Post Office Box 423
Sand Point, Alaska 99661
EMAIL: sppd@arctic.net

TEL: (907)383-3700
FAX:(907)383-5496

MEMORANDUM

To: Honorable Glen Gardner, Mayor, City of Sand Point
Mr. Andy Varner, City Administrator, City of Sand Point
Mr. Danny Cumberlidge, City Councilperson, City of Sand Point
Mr. Allan Starnes, City Councilperson, City of Sand Point
Ms. Shirley Brown, City Councilperson, City of Sand Point
Mr. Jack Foster Jr, City Councilperson, City of Sand Point
Ms. Marita Gundersen, City Councilperson, City of Sand Point
Mr. Emil Mobeck, City Councilperson, City of Sand Point

From: John H. Lucking, Jr., Public Safety Manager

Date: September 1, 2016

Ref: Department of Public Safety's Monthly Report for August 2016

Police Department

Public Safety Manager

- John H. Lucking, Jr.

Police Officers

- Efen Thao, Police Officer (Community Oriented Policing Grant Position)
- Michael Chiesa, Sergeant
- Cody Sanders, Police Officer
- Open Officer Position (currently recruiting)

Administrative Assistant

- Denise Mobeck/Day Dispatcher

Dispatchers

- Alfred 'Jesse' Pesterkoff, 911 Dispatcher
- Christine Nielsen, 911 Dispatcher

Police Division Activity - AUGUST

11 cases were generated
- 1 Theft
- 1 Agency Assist
- 1 Stolen Vehicle
- 2 Arrest Warrant
- 1 Damaged phone report
- 1 DUI, Eluding, Assault (2)
- 1 Trespass
- 1 Title 47 mental health hold
- 1 Ammonia leak at Trident
- 1 Vessel in distress

There were 4 persons jailed
- 2 Arrest Warrant
- 1 DUI's
- 1 Title 47 mental health hold

There were 72 calls to 911
- 8 MOC requests
- 1 MOC call not on 911 line
- 3 ambulance request
- 38 hang up or mis-dials
- 3 REDDI report
- 3 removal of person from residence
- 5 drunken disturbances at tavern
- 1 criminal trespass
- 1 domestic violence (3 calls for same incident)
- 1 mental health concern
- 4 welfare check (3 calls for same incident)
- 1 stalking
- 1 ammonia leak
- 2 misc officer needed
- 1 suspicious package found

Officer Calls for Service
- Concerned parent
- Criminal mischief
- Drunken person passed out
- 2 Domestic violence calls
- Found phone, possibly stolen
- REDDI report
- Drunken person
- Boat in distress
- Stolen vehicle

Other Officer Activity
- Advisement to person for abusing 911
- Transport prisoner to airport
- Drug test performed requested by court
- Courtesy transports
- Check on suspicious vehicle
- Impound 4-wheeler for underage driver
- Bar checks
- Removed debris from roadway

5 traffic stops
2 Juveniles on ATV on main road
1 DUI
2 verbal warning for speed

Officer spoke to high schoolers regarding ATV regulations and discussed safety course requirement.

EMS Division

Chief of EMS Division:

- Denise Mobeck, EMS Coordinator

EMS Activity:

Rescue1 transported 2 patients to clinic
Rescue1 responded to 1 call and patient refused service
Rescue1 standby for ammonia leak

Fire Division

Chief of Fire Division:

- Vacant, administrative duties being fulfilled by DPS Manager and supported by DPS and DPW personnel.

Activity:

- Recruitment efforts continue as the department seeks to fill the vacant fire chief position.
- Rainmaker fire boat assisted a vessel in distress by Range Island. Thank you Allan!

August 2016 Public Works Report

Shop

- Work on little rock crusher
- Change brakes on ford ranger
- Fix tires on water sewer truck
- Hauled water to city shop
- Grade roads
- Fix tires on landfill truck
- Hauled 42 loads of 3.5in minus rock to trident
- Hauled 10 loads of d1 from western marine to trident
- Change brakes and rear door actuator on police car
- Fuel buildings
- Sweep roads
- Replace belt and shaft on glass crusher
- 08 chevy truck tires and alignment
- Remove alders by school playground
- Open up all the bus stops
- Change turbo tube on cat grader
- Pulled transmission out of the water sewer truck
- Fixed bracket on ambulance

Landfill

- Clean up around dumpsters
- Short handed
- Received parts for oil pump and shut off solenoid

Recycling

- Recycling center is running fine
- Worked on glass crusher
- Short handed

Water and Sewer

- See attached

August 2016 W&S

Lift Stations:

- Changed out relay in control panel connected to float that turns the pumps on and got Pump 1 to come on in automatic for the first time in about a year

Sewer plants:

- Pumped one vacuum truck load from Russian Town plant
- Raised and levelled gate at Russian Town Plant

Harbor:

- Some boats seem to be wasting water on the floats about 25% to 30% increase in electrical, chlorine and polymer use this summer. We will probably post notices at the Harbor next year recommending water hoses not be left running. I noticed one boat that had water flowing out of it continuously and with 2 hoses running onboard.
- Added some electrical receptacles to the Net shed to help SSD & 4th of July and other events. Will be turned off except for events to save on electric bill
- Replaced leaking yard hydrant by East Wall

Water Plant

- Fuel use this month is still way down. Thanks to the efficiency team from ANTHC. We have only used about 5 inches, maybe 30 gallons, in the last two months. Prior usage was about 400 gallons a month – mostly due to a zone valve that had stopped closing.
- Fixed small leak on polymer pump discharge

Water System

- While cleaning the intake screens in the reservoir we found 2 that had been damaged by ice. Public Works straightened and welded the screens back in place for us
- Continued flushing hydrants around town. Should get them all this year
- Rehung small gate on fence at school pump house
- Replaced 1" iron Tee in service line to two houses on Balboa Court. The Tee had about a ¼" hole in it that was leaking 6 to 8 thousand gallons a day. The hole developed in 2014 – about 28 years after the water line was installed. We used lead free brass fittings for the repair that should last indefinitely.
- Added packing to pump 3 at the intake pump house to slow down the water leaking from around the shaft. Normal maintenance.
- Replaced door locks on intake pump house so the door knob and dead bolt would use same key
- We had high chlorine and polymer demand after a couple days of heavy rain in the first half of August. Pretty sure it was from water filling the bogs and bringing tannic acid and other organic material out from decayed plants. The high demand lasted about two weeks and has not reoccurred with later rains. Many of you will remember the greenish brown water we used to have in the summer before we got the new water plant.

Tested the well at the old Reeve's terminal and the water came back high for arsenic and iron, but there was no fecal bacteria (ecoli) or oil, grease or other synthetic contaminants. I also received a request to test the State well at the ARFF building, but have not done that one yet. Notified the weather people to continue to use water at the terminal for flushing toilets and washing hands, but not for drinking. I wanted to confirm and record the contaminants found a few years ago – we didn't take the original test and I could not find a copy when I asked around town.

Sand Point Boat Harbor Report 09-02-16

Everything is going well at the harbor, dump runs on a regular basis, hauled used oils to city shop, maintaining the equipment on a weekly schedule.

Hauled a total of twenty-five boats in the month of August, stored sixteen for the winter.

Helped the Silver Salmon Derby operation get ready, Just being busy at the harbor.

That's all I have to report at this time.

Richard Kochuten, Sr.
Harbor Master

STUDENT REPRESENTATIVE

HEARINGS, ORDINANCES AND RESOLUTIONS

City of Sand Point

RESOLUTION 16-09

A RESOLUTION OF THE SAND POINT CITY COUNCIL APPOINTING ELECTION JUDGES FOR THE OCTOBER 6, 2015 GENERAL CITY ELECTION.

WHEREAS, the City of Sand Point's General Election will be held October 4, 2016, and

WHEREAS, the City of Sand Point's Code, Section 4.20.020 requires that the Council appoint three election judges to constitute the election board, and

WHEREAS, the City Clerk has recommended the following names to the Council to serve in this capacity:

Maryann Krone	Judge
Laiv Gundersen	Judge
Anne Morris	Judge

NOW, THEREFORE BE IT RESOLVED BY THE CITY COUNCIL OF SAND POINT;

1. The above list of persons are appointed to serve as election judges in the October 4, 2016 election.
2. They shall serve under the direction of the City Clerk to conduct the election in a proper manner.
3. Should they be unable to fulfill their duties on election day an alternate shall be named by the majority of the election board members present.
4. They shall be compensated at the rate of $15.00 per hour worked.

PASSED AND ADOPTED BY A DULY CONSTITUTED QUORUM OF THE CITY COUNCIL FOR THE CITY OF SAND POINT ON THIS 6th DAY OF SEPTEMBER, 2016.

_____
Glen Gardner, Jr., Mayor

ATTEST:

_____
Shannon Sommer, City Clerk

City of Sand Point

RESOLUTION 16-10

A Resolution of the City of Sand Point identifying the lack of adequate broadband internet service at a reasonable cost and supporting efforts to obtain grants and other funding sources and collaborate on a regional solution to bring broadband service to the Aleutian/Pribilof region to meet the established standards of bandwidth, speed, and latency established by the Statewide Broadband Task Force.

WHEREAS, broadband internet service has become a necessary communication tool for service delivery and economic development; and

WHEREAS, the Statewide Broadband Task Force (SBTF) recommended in its 2014 A Blueprint for Alaska's Broadband Future a goal of connectivity at a minimum rate of 100 megabits per second (mps) for every Alaskan household by 2020; and

WHEREAS, the SBTF further set a goal of no more than 20 milliseconds of latency (delay) for broadband service for each Alaskan household; and

WHEREAS, present speeds are a fraction of the 100 mps recommended standard and far exceed the 20 millisecond latency rate in Southwest Alaska; and

WHEREAS, with today's technology the only way to obtain these SBTF goals is through a broadband delivery system based largely on a fiber optic network or a proposed constellation of low orbiting satellites that are designed to operate with greatly reduced latency; and

WHEREAS, challenging terrain, immense geographical separation, and a widely dispersed population have made installation of the broadband infrastructure needed to provide internet service at the level recommended by the SBTF unattractive due to significant costs for private internet providers; and

WHEREAS, there are many examples in Alaska and in other parts of the country where public/private partnerships have been successful in constructing and operating broadband systems in remote areas with low population density; and

WHEREAS, numerous studies have documented how broadband service has ushered in advances in education, public safety, medical diagnoses and treatment, job training, job creation, business development and marketing, and many other facets of human endeavor; and

WHEREAS, lack of adequate broadband service is negatively impacting economic growth, safety, quality of life, education, medical care, and job creation potential for Southwest Alaska; and

WHEREAS, broadband service is even more essential in areas like the Aleutian and Pribilof areas that are geographically remote; and
WHEREAS, broadband access and use needs to be affordable for lower income families and priced at levels roughly equal to service in Alaska's largest cities.

NOW BE IT RESOLVED that the City of Sand Point recognizes the need for broadband service at affordable rates for Sand Point and strongly encourages and supports a project to address this lack of a basic communication service; and

NOW BE IT FURTHER RESOLVED that the City of Sand Point supports efforts of a coalition of nonprofit groups and government organizations representing various constituencies and regions of Southwest Alaska to seek grant funding from the U.S Economic Development Administration to look at all alternatives on how to bring affordable broadband service to Southwest Alaska within parameters recommended by the SBTF and determine how this new broadband infrastructure will be constructed, financed, and managed.

PASSED AND APPROVED BY THE SAND POINT CITY COUNCIL THIS 6TH DAY OF SEPTEMBER, 2016.

CITY OF SAND POINT

_____
Glen Gardner Jr., Mayor

ATTEST:

_____
Shannon Sommer, City Clerk

OLD BUSINESS

COMPREHENSIVE PLAN UPDATE

City of Sand Point

Memo

To: Mayor Gardner

From: Andy Varner, Administrator

cc: City Council

Date: August 31, 2016

Re: Comp Plan Update

You'll see the proposed options for the comprehensive plan update from AECOM (formerly URS). The options are based on our agreed upon "budget" with them, about $36,000 in professional services due to our settlement over the harbor billets.

The timing is totally up to us, their schedules are flexible. I think leaning on them for some of our post annexation questions might be preferred, such as updated land use and zoning maps due to potential expansion of the City boundaries. For that reason, I am inclined to support Option 1.

If we think having Jon visit the community for one night and spend some time at a workshop with the Council is worth it, I could get a cost estimate on that too. We could consider that Option 1+.

SCOPE OF WORK
City of Sand Point Comprehensive Community Development Plan: Update

Primary differences between Options 1 and 2:

- Option 1 has more figures, Option 2 has fewer
- Option 1 has four meetings, Option 2 has three meetings
- With Option 1, Jon Isaacs can focus more on land use planning, zoning, and consulting on annexation—these were things that the City expressed heavy interest in
- With Option 2, Jon goes to Sand Point, which could bolster community relations, and provide the opportunity for data collection (GPS points) and photographs

Option 1: No Travel to Sand Point

Data update

- Review of current documents
- Updated information (demographics, infrastructure)

Plan Development

- In depth planning and zoning
- In depth and use planning
- Annexation consultation
- Goals and objectives

Figures and GIS

- Scenario 1: All available GIS data is provided to AECOM by Sand Point
    - Update of the 5 current figures, production of up to 3 additional figures of the same extent
- Scenario 2: No GIS data is provided to AECOM by Sand Point
    - Update of the 5 current figures, production of up to 2 additional figures of the same extent

Project Management

- Up to four 1-hour meetings, with meeting notes provided to Sand Point within 10 days of meeting. AECOM attendees: Jon Isaacs, Laura Young, Jessica Evans
- Financial tracking, invoicing, progress reports

Deliverables:

- Meeting notes
- Draft Plan
- Final Plan

Option 2: Travel to Sand Point

Data update

- Review of current documents
- Updated information (demographics, infrastructure)

On-site visit

- Travel of Jon Isaacs to the community of Sand Point for one night. Opportunity for meeting with the council, gathering on-site data, and taking current photographs

Plan Development

- Some planning and zoning
- Some and use planning
- Minimal annexation consultation
- Goals and objectives

Figures and GIS

- Scenario 1: All available GIS data is provided to AECOM by Sand Point
  - Update of the 5 current figures
- Scenario 2: No GIS data is provided to AECOM by Sand Point
  - Update of 4 of the 5 current figures

Project Management

- Up to three 1-hour meetings, with meeting notes provided to Sand Point within 10 days of meeting. AECOM attendees: Jon Isaacs, Laura Young, Jessica Evans
- Financial tracking, invoicing, progress reports

Deliverables:

- Meeting notes
- Draft Plan
- Final Plan

NEW BUSINESS

QAGAN TAYAGUNGIN TRIBE
P.O. BOX 447
SAND POINT, ALASKA 99661
PHONE (907) 383-5616
FAX (907) 383-5814

August 25, 2016

City of Sand Point
P.O Box 249
Sand Point, AK 99661

Dear Mayor Glen Gardner Jr. & Council,

Summer 2016 has passed so quickly and fall is in the air. I hope you were able to take advantage of the sunny weather, berry picking season, and had a good time at the Tribe's Culture Camp. With fall approaching, we're starting to make preparations for Christmas. Each December, the Qagan Tayagungin Tribe holds its annual Community Christmas Potluck. This joyful event provides all community members a chance to win prizes and money, and all the children of Sand Point receive their first Christmas gift of the season.

The Qagan Tayagungin Tribe is inviting you to be involved in these festivities by contributing a donation to cover some of the food and gifts. Each year we purchase gifts for approximately 150 children, including some extra for children who may not have been present when we put together our Christmas list to ensure each child who attends receives a gift. With the cost of gifts and other supplies, (tablecloths, utensils, decorations, and food) we anticipate the cost of the 2016 Christmas potluck to be approximately $7,500.00.

There is no better way to kick off the holiday season than to celebrate together with family, friends, community, food and fun. We hope you will consider supporting the tribe in keeping this tradition alive and thriving. Any and all donations will be greatly appreciated. If you have any questions regarding this event, please feel free to contact me at the tribal office.

Sincerely,

Tiffany Jackson
Executive Director

PUBLIC COMMENTS

COUNCIL COMMENTS

ADJOURNMENT

FYI

CITY DOCK 65% SUBMITTAL DESIGN DOCUMENTS

Add the following section:

SECTION 207

ARMOR REVETMENT

207-1.01 DESCRIPTION. Construct armor rock slope protection utilizing salvaged material from the existing shore protection and new material as shown on the Drawings.

207-2.01 MATERIALS. Rock shall be rough, angular, dense, sound and durable. Rounded rock will not be accepted for use on this project. Rock shall be fine grained, free from faults, fissures, seams, laminations, planes of weakness, or bands of minerals or deleterious materials that would result in breakage during or after placement in the shore protection. Rock shall be free of expansive or other materials which would cause accelerated deterioration by exposure to project conditions. The greatest dimension of each rock shall be no greater than 3 times the least dimension.

Test results shall be submitted to the Engineer for approval 30 days prior to any transport of rock. Rock shall be tested as specified below:

Designation	Test Method	Specification
ASTM D4992	Standard Practice for Evaluation of Rock to be Used for Erosion Control	
ASTM C127	Density, Relative Density (Specific Gravity), and Absorption	(BBSD) Not less than 2.65 Absorption: not greater than 2.5%
ASTM D5312	Evaluation of Durability of Rock for Erosion Control Under Freezing and Thawing Conditions	Not greater than 10.0% loss (100 cycles)
ASTM D5313	Evaluation of Durability of Rock for Erosion Control Under Wetting and Drying Conditions	Not greater than 10.0% loss (80 cycles)
ASTM C295	Petrographic Examination of Aggregations for Concrete	No significant deleterious material
ASTM C535	Resistance to Degredation of Large-Size Course Aggregate by Abrasion and Impact in the Los Angeles Maching	Not greater than 20.0% loss
CRD-C 148-69	Method of Testing Stone for Expansive Breakdown on Soaking in Ethylene Glycol	No Breakage

Testing shall be the responsibility of the Contractor and shall be performed by an independent commercial test laboratory approved by the Engineer. The Contractor shall furnish certified, complete copies of all test results to the Engineer. Previous tests for an existing quarry dated within 5 years of contract are acceptable.

Quarried armor rock shall be stockpiled for a curing period of 45 days, unless the Contractor can provide evidence that curing is unnecessary. The curing operations on freshly quarried stone are to allow it to release stored energy and moisture and to allow the stone to demonstrate that it will not fracture during the energy release and drying-out phase.

Gradation requirements shall be as follows:

1. Class A Armor Rock – Shall be well graded with weights of individual stones ranging from at least 1,600 pounds to 2,700 pounds. At least 50% of the individual stones shall weigh more than 2,200 pounds.

2. Class B Armor Rock – Shall be salvaged from the existing shore protection that is to be removed as part of this project.

For each type of rock to be used, test at least 2 representative samples for gradation. Tests shall be by actual weighing. Results shall be provided to the Engineer within 24 hours. Each sample shall be approximately 15 cubic yards in volume. Sample rocks that are weighed shall be marked with the measured weight be provided on site and at the quarry for comparative purposes. For production purposes individual rocks do not need to be weighed, unless there is a QC or QA issue with the rock.

Additional testing shall be performed on a minimum of one material sample upon any change in the material. A change in material consists of a visually apparent change in gradation, coloration or other physical characteristic of the material.

CONSTRUCTION REQUIREMENTS.

207-3.01 GENERAL. The existing slope protection shall be removed to the limits shown on the Drawings. All existing armor rock shown in the Drawings to be salvaged shall be set aside for later use in construction of the new slope protection. The armor rock slope protection shall be constructed to the minimum thickness, height and length indicated using new and salvaged material as shown in the Drawings.

207-3.02 SALVAGED ARMOR ROCK. Excavation of the existing Class “A” and Class “B” Armor Rock shall be performed in a manner that causes minimal disturbance to the underlying Filter rock. Care shall be taken to prevent deleterious materials from mixing with and/or contaminating the salvaged material during excavation. Contractor shall not use a means of excavation that will cause damage to the armor rock material to be salvaged.

Salvaged material shall be stockpiled at an approved location for future project use. The stockpiled material shall be protected from mixing with other construction materials being used for the project.
Prior to reuse in construction of the new armor slope protection, at the direction of the Engineer, the Contractor shall blend the stockpiled material to eliminate any segregation that may have occurred during stockpiling. Material shall be handled in a manner that prevents segregation and does not cause damage to the salvaged stone.

207-3.03 INSTALLATION OF NEW SLOPE PROTECTION. Place the armor layer to the minimum thickness, height and length indicated in the Drawings and at least two (2) stones thick. Placement shall be in a well graded mass with a minimum of voids. The finished slope shall form a uniform and regular surface not steeper than the slopes indicated on the Drawings. Armor rock placement shall be without overhanging or "floater" rocks and without voids underneath any layer of rock. Armor rock shall be seated on the underlying rock to prevent slipping, rocking or displacement under either wave action or the weight of overlying rock.

Manipulate the rock sufficiently using a backhoe, rock tongs, or other suitable equipment to secure a reasonably regular surface and stability. All armor rock shall be stable, keyed and interlocked with neighboring rocks. Individual stones shall not protrude more than 12 inches above the average level of the finished revetment surface.

All armor rock shall be placed in a manner to avoid segregation, displacing underlying materials or placing undue impact force on underlying material. Placing stone through chutes, dropping stone more than four feet and other methods which segregate or damage the stone or underlying material will not be permitted. The finished revetment surface shall be free from pockets of stone that are less than the average size.

For each class of rock included in the armor layer, placement of the full course thickness shall occur in one operation, beginning at the bottom of the slope and proceeding up the slope.

207-3.04 SURVEYS. The Contractor shall perform and submit pre-construction, intermediate and post construction surveys of the armor rock revetment for determination of conformance to the specified grade and thicknesses shown in the Drawings. Intermediate surveys shall be performed upon completion of each course included in the armor revetment (i.e. granular fill embankment, filter rock, Class "B" Armor Rock and Class "A" Armor Rock).

All surveys shall be performed by a licensed surveyor and the in-water surveyor shall be normally engaged in the business of hydrographic surveying.

The Engineer shall be notified a minimum of 5 days prior to any surveys. The Engineer may be present during all surveys and may accompany the surveyor on board the survey vessel.

Cross-sections shall occur at 20 feet on-center and be perpendicular to the shore protection. Cross-sections shall capture all break points and extend a minimum of 20 feet beyond the toe, top and sides of the slope.

Surveys results shall be submitted for Engineer approval that the placement of each course of slope protection conforms to the Drawings prior to placement of the subsequent course. Deficiencies identified by the surveys shall be corrected before continuing with placement of subsequent courses of slope protection. Additional surveys may be required until placed material is to the limits indicated on the Drawings. Such additional surveys shall be performed at the Contractor's expense.

Surveys shall conform to the following maximum allowable tolerances:

1. Land Surveying: plus or minus 0.02 feet horizontal, and plus or minus 0.1 feet vertical.
2. Hydrographic Surveying: plus or minus 0.50 feet horizontal, and plus or minus 0.2 feet vertical.

Survey tolerances shall not accumulate.

Surveys shall be performed in accordance with the above and as described in Section 642 – Construction Surveying and Monuments.

207-4.01 METHOD OF MEASUREMENT. *Section 109.*

207-5.01 BASIS OF PAYMENT . The contract price includes the cost of labor, materials, and equipment necessary to complete the work as shown on the Drawings.

Costs for removing, stockpiling, and placing existing Armor Rock shall be included in Item 207(3) – Salvaged Class A Armor Rock and Item 207(4) – Salvaged Class B Armor Rock.

Payment will be made under:

Pay Item	**Pay Unit**
207(1) Class A Armor Rock	Lump Sum
207(2) Class B Armor Rock	Lump Sum
207(3) Salvaged Class A Armor Rock	Lump Sum
207(4) Salvaged Class B Armor Rock	Lump Sum

SECTION 301

AGGREGATE BASE AND SURFACE COURSE

301-3.03 SHAPING AND COMPACTION. *Delete paragraph two and replace with the following:*
Spread and shape the material to the required grade and section. Water or aerate as necessary to provide the approximate optimum moisture content for compaction. Compact each layer as defined in Section 203-3.05.

SECTION 501
STRUCTURAL CONCRETE

501-2.01 MATERIALS. Add the following:

Steel Embeds. Fabricated steel embeds shall conform to the requirements of Section 504.

Reinforcing Steel. Reinforcing steel shall be new billet stock ASTM A706 Grade 60 rebar, galvanized per ASTM A767 with chromating requirements of section 4.3 omitted. Galvanizing shall be performed after fabrication. Reinforcing steel shall be supported on approved galvanized or plastic chairs or well-cured concrete blocks. Tie wire shall be galvanized.

501-3.01 PROPORTIONING. Add the following:

Cast-in-place Concrete shall conform to the following:

Cement Content*, sacks/yd3, minimum	7.0
Water Cement Ratio, lbs/lbs, maximum	0.4
Silica Fume, lbs/cy	35 min
Slump Range, inches (before plasticizer)	4 (max)
Entrained Air Range, %	4-7
Coarse Aggregate Gradation, AASHTO M43	No. 57 or 67
Compressive Strength, psi, min.	6,000

501-3.08 PLACING CONCRETE.

1. General. Add to the end of the first paragraph: All concrete shall be installed in a neat and workmanlike manner. Concrete that exhibits excessive cracking, poor finish, or does not match the surrounding concrete aesthetically may be rejected and require replacement.

501-3.09 FINISHING CONCRETE SURFACES. Add the following:

5. Broom Finish. All concrete surfaces shall receive a broom finish, unless noted otherwise. Finish shall conform to ACI 301 and ACI 117. Immediately after concrete has received a floated finish, give the concrete surface a coarse transverse scored texture by drawing a broom across the surface. Texture shall be plus or minus one-sixteenth (±1/16) of an inch.

501-5.01 BASIS OF PAYMENT. Replace the first paragraph with the following:

The quantities of reinforcing steel, embeds and other items included in cast-in-place concrete shall be considered subsidiary to the concrete.

The price for Item 501(7) – Precast Concrete Panels shall include all materials, labor, equipment and incidentals required for the fabrication, shipment and installation of the precast concrete panels as shown on the Drawings, complete-in-place.

Add the following:

Payment will be made under:

Pay Item	Pay Unit
501(7) Precast Concrete Panels	Lump Sum
501(9) Stage 1 Cap	Lump Sum
501(10) Stage 2 Cap	Lump Sum

Replace Section 504 with the following:

SECTION 504

STEEL STRUCTURES

504-1.01 DESCRIPTION. This Work includes the furnishing, fabricating, erecting, and coating of structural metals and composite materials shown on the Drawings, including bolts and fasteners, stud sheer connectors, welding, special alloy steels, metallic electrodes, structural steel, special and alloy steels, steel forgings and castings, and iron castings. This Work also includes any incidental metal construction and elastomeric and plastic materials.

504-2.01 MATERIALS. All materials shall be the sizes shown on the Drawings.

Steel Shapes & Plates. Unless noted otherwise, all structural steel shapes (W, HP, L, C, ST) and plates shall be ASTM A572 Grade 50, or approved equal. All structural steel greater than 1-inch or greater in thickness shall be 100% straight beam ultrasonically tested for laminations per ASTM A578 on a 6-inch grid and evaluated under Acceptance Standard – Level C. Plates not meeting the acceptance standard evaluation criteria shall be replaced with material meeting the specification.

HSS sections shall be ASTM A500 Grade B.

Shear studs shall conform to ASTM A108 Grade 1015.

Miscellaneous Steel Pipe shall be ASTM A252 Grade 2 or 3, or ASTM A53 Grade B, Type E or S, or ASTM A500 Grade B.

Bolts, Nuts and Washers. Unless noted otherwise, all bolts connecting steel to steel or steel to concrete shall be ASTM A325 and galvanized. All other bolts shall be ASTM A307 and galvanized, unless otherwise noted. Galvanized washers shall be used in all areas where the bolt or head or nut will bear against timber or concrete or against oversized holes in steel. An oversized hole is defined as being greater than 1/16 inch larger than the bolt diameter. Galvanized nuts and washers shall conform to the specification for the corresponding bolt. Galvanized malleable iron washers or economy heads are required wherever bolt heads or nuts bear against wood.

Weld Materials. All filler metal shall meet charpy impact criteria of 20 ft.-lb. at -20˚F and shall have a maximum carbon content of 0.20%. Electrodes shall be properly E70xx and meet requirements of AWS D1.8.

Reflective Tape. Reflective tape shall be two inch (2”) wide prismatic reflective tape that is UV stabilized and designed to with stand marine environments and extreme cold. Color of tape shall be as indicated in the Drawings. Samples shall be submitted with manufacturer’s specification to the Engineer for approval prior to installation.

Anodes. All anodes shall be aluminum alloy of the specified weight and nominal dimensions shown on the Drawings and have the following properties:

1. Electrochemical capacity greater than or equal to 1,150 A-Hr/lb.

2. Consumption rate less than or equal to 7.6 lbs/A-yr.

3. Open Circuit potential more electronegative than or equal to -1.05 V (Ag/AgCl)

Anodes shall conform to NACE RP0387 and the composition specified as follows. Contractor shall submit a manufacturer’s certificate of conformity.

Element	Percent by Weight
Zinc (Zn)	2.5 – 5.75%
Silicon (Si)	0.08 – 0.12%
Iron (Fe)	0.09% Maximum
Cadmium (Cd)	0.002% Maximum
Mercury (Hg)	0.001% Maximum
Tin (Sn)	0.001% Maximum
Indium (In)	0.015 – 0.02%
Copper (Cu)	0.003% Maximum
Lead (Pb)	N/A
Aluminum (Al)	Remaining Balance

The recommended aluminum anode manufacturers/types are Aloline (Farwest Corrosion Control Co.), Glvalume III, or Corrpro Alloy 2, but others may be used provided that they are submitted to the Engineer for review and approved prior to their use.

The steel core for anodes shall be ASTM A36 or Engineer approved equal for mild steel bar stock. The core shall be placed longitudinally in the anode material and be abrasive blasted to near-white finish in accordance with SSPC SP-10/NACE No. 2. The core shall be cast with the anode material within four (4) hours of blasting.

If anodes are not stored inside a building, tarps or similar protection shall be used to protect anodes from inclement weather.

Ladder Rungs. All ladder rungs shall be rebar grade 60 ASTM A706. Welding of rebar shall be per AWS D1.4.

504-2.02 PROTECTIVE COATINGS AND TREATMENT. Unless noted otherwise, all steel, pipe and hardware shall be hot-dipped galvanized or spray metalized.

Galvanizing. Hot-dipped galvanizing shall be performed in accordance with ASTM A385, A123, or A153. Galvanizing shall be performed after fabrication, and all holes required for galvanizing shall be repaired per AWS D1.1, and in accordance with Sub-Section 3.2, unless otherwise approved by the Engineer. Damaged galvanizing including that removed for welding shall be repaired by the Contractor per the Project specifications.

Spray Metalizing. Thermal Spray Metallic Coating shall be with 85%zinc/15% aluminum applied to a minimum dry coating thickness of 15 mils, and shall be top coated with a high solids polyurethane clear sealer specific for marine submersion environments, applied to a minimum dry film thickness (DFT) of 2-3 mils and applied per Manufactures recommendations. Submit product for Engineer review and approval prior to use.

Non-Skid Surfacing. All steel walking surfaces, including but not limited to the top surface of the face beam, fender pile top plate, ladders, etc., shall be spray metallized with a non-skid product in accordance with manufacturer's recommendations and these specifications.

Metal surfaces specified to be Non-Skid shall be thermal arc-sprayed with TH604 and/or TH605, as manufactured by Thermion, TRACLON 500 as manufactured by MBI Coatings, Duralcan 90/10 or 60/40 as manufactured by Alotec or Engineer approved equal to achieve a very aggressive surface profile. Blast surface and prep as required by Non-Skid coating manufacturer prior to Non-Skid coating application. Surfaces noted shall be sprayed to achieve a non-skid surface with peak to valley thickness of 75 to 15 mils.

Paint. All painted surfaces shall be initially hot-dipped galvanized and painted with two-mil coats of zinc oxide paint. Unless noted otherwise, top coat shall be “Caterpillar yellow” or other suitable bright safety yellow. The galvanized surface shall be prepared per ASTM D6386 and SSPC-SP16 using sweep blasting prior to painting.

CONSTRUCTION REQUIREMENTS

504-3.01 IN-WATER WORK RESTRICTIONS. See Appendix B.

504-3.02 FABRICATION & ERECTION. The Contractor shall provide all materials labor, tools and equipment necessary for the expeditious handling of the Work, and shall erect the structural steel, remove the temporary construction and do all work necessary to complete the structure, as required by the contract and in accordance with the Drawings and these specifications. All temporary field welds to structural steel shall be made in accordance with the procedures required by these specifications. Sharp kinks or bends shall be cause for rejection of the steel.

All steel fabrication and erection shall be per the latest AISC Specifications and in accordance with the Plans and approved shop or working drawings. Workmanship and finish shall be equal to the best practice in modern fabrication shops. Portions of the work exposed to view shall be finished neatly. Shearing, flame cutting and chipping shall be done carefully and accurately. All parts shall be accurately fabricated and assembled as shown on the Drawings. The material shall be carefully handled so that no parts will be bent, broken or otherwise damaged. Bearing surfaces and surfaces to be in permanent contact shall be cleaned prior to members being assembled.

Structural material shall be stored in a covered location at the fabricating shop above the ground on platforms, skids or other supports. It shall be kept free from dirt, grease, or other foreign matter and shall be protected from corrosion. Material stored onsite shall be kept clean, protected from damage and properly drained.

Rolled material, before being laid off or worked, must be straight. If straightening is necessary, it shall be done by methods that will not injure the metal. Sharp kinks and bends shall be cause for rejection of the material.

All flame cut steel must be cut using a mechanical guide to ensure a smooth surface. Flame cutting by hand shall only be performed where approved, and the final surface shall be made smooth by planing, chipping or grinding. The cutting flame shall be adjusted and manipulated so as to avoid cutting beyond the prescribed lines. Re-entrant cuts shall be filleted to a radius of not less than 1 inch or as shown on the Drawings.

Finished members shall be true to line and free from twists, bends and open joints.

Unless noted otherwise, all ASTM A325 bolts shall be installed per AISC RCSC requirements, or Engineer approved method.

Before starting the Work, the Contractor shall submit to the Engineer for review and approval, the method of erection, and the amount and character of the equipment to be used. Handling and erection procedures shall be conducted in such a manner as to avoid inducing critical buckling stresses in the materials and to avoid damaging the protective coating or paint system. Working drawings showing the method of erection shall be submitted for approval. The approval of the Engineer shall not be considered as relieving the Contractor of the responsibility for the safety of his method or equipment or from carrying out the Work in full accordance with the Plans and specifications. No work shall be performed until approval has been obtained.

The straightening of plates and angles or other shapes shall be done by methods not likely to produce fracture or other injury. The steel shall not be heated unless permitted by the Engineer.

All anticipated splices shall be shown on the Shop or Working Drawings. Splices shall be complete penetration butt welds. Grind flange splices flush. Grind web splices flush on the outside face of exterior girders only. Grind parallel to the longitudinal axis of the girder. Completely weld each element of a girder, such as flange or web, before attaching it to another element. Make all splices at least 6 inches from the nearest stiffener plate.

Bolt Holes. All holes for bolts shall be either punched or drilled. Material forming parts of a member composed of not more than 5 thicknesses of metal may be punched 1/16-inch larger than the nominal diameter of the bolts whenever the thickness of the metal is not greater than 3/4-inch for structural carbon steel or 5/8-inch for alloy steel.

When there are more than 5 thicknesses or when any of the main material is thicker than 3/4-inch in carbon steel, or 5/8-inch in alloy steel, all the holes shall be subpunched or subdrilled 3/16-inch smaller, and after assembling, reamed 1/16 inch larger, or drilled from the solid to 1/16-inch larger than the nominal diameter of the bolts.

1. Punched Holes - The diameter of the die shall not exceed the diameter of the punch by more than 1/16-inch. If any holes must be enlarged to admit bolts, they shall be reamed. Holes must be clean cut, without torn or ragged edges. Poor matching of holes will be cause for rejection.

2. Reamed or Drilled Holes. Reamed holes shall be cylindrical, perpendicular to the member, and not more than 1/16 inch larger than the nominal diameter of the bolt. Where practicable, reamers shall be directed by mechanical means. Drilled holes shall be 1/16-inch larger than the nominal diameter of the bolt. Poor matching of holes will be cause for rejection. Reaming and drilling shall be done with twist drills.

3. Holes for Hot-Dip Galvanized Members. For fabrications and associated hardware that are hot-dip galvanized, bolt holes may be 1/8-inch larger than the nominal diameter of the bolt if approved by the Engineer.

4. Accuracy of Punched or Subdrilled Holes. All holes punched full size, subpunched, or subdrilled shall be so accurately punched that after assembling (before any reaming is done) a cylindrical pin 1/8-inch smaller in diameter than the nominal size of the punched hole may be entered perpendicular to the face of the member, without drifting, in at least 75 percent of the contiguous holes in the same plane. If the requirement is not fulfilled, the badly punched pieces will be rejected. If any hole will not pass a pin 3/16-inch smaller in diameter than at the nominal size of the punched hole, this will be cause for rejection.

5. Bolt Lengths. Unless otherwise noted on the Plans, bolt lengths shall be determined by adding the grip length values given in Table 504-1 to the total thickness of connected material. Add additional length as required for connections requiring washers and double or jam nuts. The below listed values compensate for thickness of nut and bolt point. The total length shall be adjusted to the next longer 1/4-inch increment up to a 5-inch length and to the next longer 1/2-inch increment for lengths over 5 inches. In any case, the minimum bolt length shall be flush with the face of the tightened nut or jam nut. Unless otherwise permitted by the Engineer, the maximum length of bolt shall extend out no more than 1-inch from the face of the tightened nut or jam nut.

TABLE 504-1

BOLT LENGTH DETERMINATION

Bolt Diameter Size	Added Length

(Inches)	(Inches)
1/2	11/16
5/8	7/8
3/4	1
7/8	1-1/8
1	1-1/4
1-1/8	1-1/2
1-1/4	1-5/8

Bolted Parts and Assembly. Bolted parts shall fit solidly together when assembled and shall not be separated by gaskets or other interposed compressible material.

When assembled, all joint surfaces, including those adjacent to washers, shall be free of scale and excess galvanizing. They shall be free of dirt, loose rust, burrs, and other defects that would prevent solid seating of the parts.

Contact surfaces shall be free of oil, paint or lacquer.

All steel templates shall have hardened steel bushings in holes accurately dimensioned from the center lines of the connection as inscribed on the template. The center lines shall be used in locating accurately the template from the milled or scribed ends of the members.

Open Cell Sheet Pile Bulkhead Appurtenances. Installation of the dock face beam, caps, bullrails, fenders, sheet pile interlock welding, surfacing or other sensitive structures shall not be performed until the sheet pile bulkhead has stabilized as required per Section 530-3.08. A final face alignment shall be established and approved by the Engineer based on the sheet pile survey monitoring to which the face beam shall be aligned. The face beam shall be installed after a final dock face alignment has been approved in writing by the Engineer.

Piling. Installation of the piling shall conform to the requirements of Section 505- Piling.

504-3.04 WELDING. All welding shall be performed per the latest AWS D1.1 by welders qualified per AWS for the type and position of the welds.

All welder qualifications and welding procedures shall be submitted to the Engineer for review and approval at least 15 days prior to commencing welding operations.

The Contractor shall provide a Certified Welding Inspector to inspect all welds. All welds shall be 100% visually inspected. In addition, 10% of all CJP shop welds shall be tested by UT examination or other NDT methods approved by the Engineer. Such tests shall be performed by an independent qualified third party inspector. The Contractor shall submit weld inspection / NDT reports to the Engineer for review.

Any weld failing inspection shall be repaired at the Contractor's expense, which will include the cost for retesting. The Owner may provide additional inspection of shop and field welds as required. The Contractor shall be responsible for all repairs required as a result of additional Owner inspections.

Acceptance criteria for all weld inspections shall conform to AWS D1.1 criteria for statically loaded structures.

Any rebar welding shall be performed and accepted per AWSD1.4 criteria for reinforcing steel.

504-3.05 APPLICATION AND REPAIR OF PROTECTIVE COAINGS. Contractor shall take necessary means to protect coatings during transportation, handling, welding, cutting and installation. Damaged galvanizing, including that removed for welding, welds, cuts, gouges or other holidays in the coatings shall be repaired by the Contractor at no additional cost to the Owner.

Shop repair of galvanizing/metallizing shall be done by means of spray metallizing. Field repair damaged galvanizing by spray metallizing if damage is over 100 square inches in area. "Galv-Stick" or Engineer approved equal may be used for field repair damage is less than 100 square inches in area. Contractor shall submit repair materials and methods of repairs to Engineer for review and approval.

Spray Metallizing - All spray metallizing shall be performed in accordance with AWS C2.23. Steel substrate shall be prepared to SSPC-SP/NACE No. 1 white metal blast finish with a minimum angular profile depth of 2.5 mils. After blasting, remove dust and spent abrasive from the surface by using oil-free pressurized air, brushing or vacuum cleaning. The steel surface temperature shall be at least 5 degrees Fahrenheit above the dew point of the ambient air temperature. For flamespraying, the initial starting area shall be preheated to 250 degrees Fahrenheit. Feedstock shall be 85/15 aluminum/zinc applied in several passes (approximately 2-4 mils/pass) to a minimum dry coating film thickness of 12 mils. During application, spray gun shall be held perpendicular to the substrate at a stand-off distance of 6-10 inches. The Contractor shall periodically verify pass and total coating thickness.

Tensile bond strength shall be measured per ASTM D4541 at the start of each shift, after any change to the application method, or every 500 square feet. The minimum tensile bond shall be 700 psi. Contractor shall submit metallizing equipment, blast media, feedstock material certification, application and quality control method for Engineer review and approval at least 10 days prior to beginning the work.

Galv-Stick – Galv-Stick shall be zinc or aluminum alloy. Prepare damaged galvanizing with a grinder and then abrade the entire surface with a wire brush where application of the galvanizing repair is required. Clean the surface to remove all grease, oil and surface deposits. Heat local area to manufacturer suggested temperature and apply galv-stick in such a manner to achieve a minimum of 10 mil total final thickness. After cooling, apply two coats of zinc-rich paint. Allow each coating to dry thoroughly between applications.

504-3.06 CLEANUP. Upon completion and before final acceptance of the structure, remove falsework and falsework piling down to 2 feet below the finished ground line.

504-4.01 METHOD OF MEASUREMENT. Section 109. The bid schedule contains lump sum or unit pay items for the respective steel and composite structures to be incorporated into this project. Steel or other material quantities shall not be measured separately for payment. Measurement shall be made as a lump sum unit as noted on the bid schedule. Measurement shall include furnishing and installing all field and shop fabricated materials, components and assemblies as shown on the Drawings, complete-in-place.

Painting or protective coating are considered incidental and will not be measured separately for payment.

504-5.01 BASIS OF PAYMENT. The contract price includes the cost of labor, materials, equipment and incidentals necessary for the Work, complete-in-place and accepted as shown on the Drawings.

If changes or additions in the work are ordered by the Engineer, which will vary the weight of steel to be furnished, the contract lump sum price will be adjusted as provided in the General Provisions. However, no additional payment will be made for increases in structural steel quantities made necessary by the Contractor's means and methods of fabrication or erection.

Catwalk At the contract unit price shown on the bid schedule, for work, including furnishing, fabricating, and erecting, including all incidental work and materials required. The following items shall be considered subsidiary to the structure: all connecting hardware, unistruts, UHMW bearing pads, and other material fabrication and installation required to complete the catwalk as shown in the Drawings.

Mooring Dolphin At the contract unit price shown on the bid schedule, for work, including furnishing, fabricating, and erecting, including all incidental work and materials required. The following items shall be considered subsidiary to the structure: all steel, connecting hardware, piles, bullrail, ladders, bollards, and

other material fabrication and installation required to complete the mooring dolphin as shown on the Drawings.

Miscellaneous Steel At the contract unit price shown on the bid schedule, for work, including furnishing, fabricating, and erecting, including all incidental work and materials required. This item shall include all other material fabrication and installation required to complete the dock such as bullrails, swing gate, dock face bollards and cleats, safety ladders, welds, stiffeners, coatings, and splices shown in the Drawings and not specifically listed above.

Payment will be made under:

Pay Item	**Pay Unit**
504(1) Dolphin	Lump Sum
504(2) Catwalk	Lump Sum
504(3) Miscellaneous Steel	Lump Sum

Replace Section 505 with the following:

SECTION 505

PILING

505-1.01 DESCRIPTION. Furnish, fabricate, and drive of piling as shown in the plans. This section does not include piling associated with the Open Cell Sheet Pile Bulkhead which are covered under Section 530 – Open Cell Sheet Pile Bulkhead.

505-2.01 MATERIALS. All materials shall be the sizes shown on the Drawings.

Pipe Pile. Straight seam steel pipe shall conform to ASTM A252, Grade 3, except that minimum yield strength shall be 50 ksi and with chemistry meeting ASTM A36 chemistry. Dimensional tolerance shall be per API 5L. Carbon Equivalency (CE) shall not exceed 0.45 based on the following:

$$\mathrm{CE} = \frac{(\mathrm{C} + \mathrm{Mn} + \mathrm{Si})}{6} + \frac{(\mathrm{Cr} + \mathrm{Mo} + \mathrm{V})}{5} + \frac{(\mathrm{Ni} + \mathrm{Cu})}{15}$$

All steel pipe piles shall be hot-dip galvanized, full length, in accordance with ASTM A123, unless otherwise noted on the Plans. All steel pipe piles shall be furnished, complete with pile tips, in the lengths indicated on the Plans. Piles shall be delivered full length or field spliced in accordance with approved welding and galvanizing repair procedures. Splices shall be a minimum of 40-ft apart, unless otherwise approved by the Engineer. No additional compensation shall be made for splicing piles to make up the pile lengths shown on the Plans. Pile Splices shall be full-strength butt-welded with backing rings per AWS Specifications. Care shall be taken that piling remains in straight alignment through splices. No piece of pile less than 10 feet in length shall be spliced onto a pile. All piles shall be supplied with pile driving shoes.
Spiral seam pipe will be permitted for diameters greater than 18 inches that conform to the following requirements:

1. Base metal shall conform to ASTM A709 Grade 50 T2 or ASTM A572 Grade 50 and manufactured to ASTM A252 Grade 3 as modified in this section. Butt joints in the base metal shall be no closer than one pipe diameter from the pipe end.

2. The Contractor shall ensure fit-up of spiral seam pipe to adjoining elements does not exceed the welding and erection tolerances specified in AWS D1.1 and AISC 303-05. The Contractor shall verify fitment of fender panels with fender pin piles.

3. The outside diameter at any point in a length of pipe shall be within ±3/16 inch of the nominal diameter. The maximum lateral offset measured from a straight chord line shall not exceed 0.2 percent of the pipe length, not to exceed 3/8 inch in any 40-foot length. Provide pile lengths within ±2 inches from the specified lengths.

4. Fabricate pipe using the automatic submerged arc welding or automatic gas metal arc welding process. Prior to welding, submit for approval a welding plan in accordance with the Section 504-3.01.

5. Visually inspect 100% of seam welds on the interior and exterior surfaces. Welds shall be acceptable if the criteria of AWS D1.1 Section 6, Table 6.1 are satisfied. Perform UT inspection of 10 percent of seam welds on each length of pipe using acceptance criteria of AWS D1.1 Section 6, Table 6.2.

6. Evaluate the mechanical properties of the base metal and weld in accordance with ASTM A370 and AWS D1.1 Section 4.8.3. Perform destructive testing of a fabricated pipe section for each dameter of pipe furnished. A single test consists of:

    a. One base metal yield, one tensile, and one elongation test

    b. Two reduced section across the weld tensile tests

    c. One side bend weld test

7. The strength and elongation of the base metal shall be no less than the minimum values of the specified range. Evaluate the performance of the weld using the acceptance criteria of AWS D1.1.

Anodes. Anodes shall comply with the requirements of Section 504 – Steel Structures.
Miscellaneous. Miscellaneous steel plates, shapes and fabricated weldments shall comply with Section 504 – Steel Structures.

505-2.02 PROTECTIVE COATINGS. Unless noted otherwise, all pile shall be hot-dipped galvanized or spray metalized full length.

Galvanizing. All pile shall be hot-dipped galvanized per ASTM A123 after fabrication unless otherwise noted and all holes required for galvanizing shall be repaired per AWS D1.1, and in accordance with Sub-Section 3.2, unless otherwise approved by the Engineer. Damaged galvanizing including that removed for welding shall be repaired by the Contractor per the Project specification.

Spray Metalizing. Per Section 504-.02 Protective Coatings and Treatment - Spray Metalizing.

Repair of Coatings. Contractor shall take necessary means to protect coatings during transportation, handling, welding, cutting and installation. Damaged galvanizing, including that removed for welding, welds, cuts, gouges or other holidays in the coatings shall be repaired by the Contractor at no additional cost to the Owner. Repair of damaged coatings shall be performed per Section 504-3.05.

CONSTRUCTION REQUIREMENTS

505-3.01 IN-WATER WORK RESTRICTIONS. See Appendix B.

505-3.02 PILE DRIVING EQUIPMENT.

Pile Driving System. Pile driving hammers and equipment shall be selected by the Contractor subject to review by the Engineer, prior to mobilizing to the project site. The pile driving equipment shall be suitably sized to achieve the design embedment and ultimate bearing capacities identified in the plans. A vibratory hammer shall be used to drive piles to the maximum extent possible. An impact hammer with a minimum energy rating at the lowest driving setting of 60,000 foot-pounds shall be used to determine the resistance and bearing capacity of all bearing piles. If a vibratory hammer is used for the initial drive of bearing piles, an impact hammer shall be used to determine the pile bearing capacity by driving the pile an additional penetration of at least 5 feet. Pile ultimate bearing capacities shall be determined by the Engineer.

Any hammer or drill that causes damage to the piles during driving operations shall be substituted with an acceptable alternative hammer at no additional expense. Impact hammer shall be supplied with new cap block cushions, which shall be changed at the manufacturer's recommended interval. The submitted pile driving plan shall include manufacturer's recommendations and information on hammer cushion

Use only equipment included in the approved pile driving plan. The Engineer may inspect the pile driving equipment for conformance with the approved pile driving plan after it has been mobilized to the site.

Remove and replace pile driving equipment the Engineer determines does not conform with the approved pile driving plan, at no additional cost to the Owner and with no adjustment to the contract time.

Pile Driving Plan Submit a detailed work plan including technical narrative and illustrations for all pile driving systems. The plan shall be submitted no less than 30 days prior to the anticipated start of pile driving. The Contractor shall not mobilize hammers and related equipment prior to receiving written approval of the plan. Include in the pile driving plan:

8. Manufacturer's catalog cuts, specifications, manuals, guidelines and technical bulletins for all pile driving equipment to be used.

9. Limitations and capacities of listed equipment. Including, but not limited to: Crane capacity and maximum reach with the specified hammer and maximum length pile, pile driving hammer rated energy, etc.

10. Manufacturer's recommendations and information on hammer cushion

11. A description of the techniques to be used for ensuring proper placement and alignment of the piles, obtaining driving resistance, and advancing the pile to the estimated pile tip elevation.

12. Alternative methods of pile installation in the event obstructions are encountered.

13. Shop Drawings and configuration for pile driving template(s).

The Engineer's approval of the pile driving plan will not relieve the Contractor of responsibility for:

1. Removing and replacing piles damaged during pile driving operations

2. Obtaining the driving resistance specified in the plans.

3. Meeting pile tip elevation specified in the plans.

505-3.02 DRIVING PILES. Drive all piles to the capacities and minimum penetrations specified in the plans. Pile ultimate bearing capacities shall be determined by the Engineer.

All pile installations shall be conducted with the Engineer present. The Contractor shall assist the Engineer in monitoring the pile driving. The Contractor shall mark each pile with one-foot increments, with every five-foot increment numbered. For determination of pile refusal or capacity, the Contractor shall mark the piles with 1-inch increments during the final drive. The marks shall be visible and readable from all sides of the pile above local extreme low tide level. Provide notification to Engineer a minimum of 24 hours prior to any pile installation.

Tolerances Piles shall be placed within 1% of specified vertical alignment and within 2 inches of specified location at cut-off, unless otherwise noted. Piles attached to steel caps shall be accurately cut to ensure full bearing between the caps and piles. Fender pin piles shall be installed as indicated on the plans in such a manner to allow installation of the fender panel without binding.

If a bearing pile is driven to the estimated tip elevation and the Engineer determines that the required capacity has not been obtained, the Engineer may direct suspension of the pile driving operations and require the Contractor to restrike the pile.

505-3.03 OBSTRUCTIONS. Obstructions may be encountered below mudline during pile driving. Any obstructions encountered within five feet of the existing mudline shall be removed at no additional cost to the Owner. In the event that obstructions are encountered or extend below five feet from mudline

elevation, and removal is required, the Contractor shall do so in accordance with 109-1.05. The Contractor shall be prepared to immediately remove obstructions in the event they are encountered, or shall alternatively move to other contract Work so as to prevent delays

505-3.04 CLEANUP All Steel pipe pile cutoffs on this Project shall become the property of the Contractor. The Contractor shall remove the pipe from the Project Site.

505-4.01 METHOD OF MEASUREMENT Section 109.

505-5.01 BASIS OF PAYMENT The contract price includes the cost of labor, materials, equipment and incidentals necessary for the Work, complete-in-place and accepted as shown on the Drawings.

Payment will be made under:

Pay Item	**Pay Unit**
505(1) Furnish Structural Steel Piles	Lump Sum
505(2) Drive Structural Steel Piles	Lump Sum
505(3) Pile Anodes	Lump Sum
505(4) Hinge Pile	Lump Sum

Add the following Section 535:

SECTION 535

FENDER

535-1.01 DESCRIPTION. This Work includes the furnishing, fabricating, coating and installation of all materials shown on the Drawings and required for the construction of a complete fender unit. This Work also includes any incidental metal construction, piling and elastomeric and plastic materials.

535-2.01 MATERIALS. All materials shall be the sizes shown on the Drawings.

Steel Shapes & Plates. Unless noted otherwise, all structural steel shall conform to the requirements of Section 504 – Steel Structures.

Bolts, Nuts and Washers. Unless noted otherwise, all connecting hardware shall conform to the requirements of Section 504 – Steel Structures.

Fender Piles. Unless noted otherwise, all fender pin piles, shall conform to the requirements of Section 505 – Piling.
Fender Sleeves. Shall conform to ASTM A709 Grade 50T3 and shall be fabricated according to American Petroleum Institute (API) Specification 2B.

Weld Materials. Unless otherwise noted, all filler metal shall conform to the requirements of Section 504 – Steel Structures.

Rubber Energy Absorber.
Cylindrical fenders shall be approx. 40-inch (OD), meeting the following requirements:

Material property requirements:

Property	Test Method	Condition	Requirement
Tensile Strength	ASTM D412 DIE C	Original	1900 PSI min
		Aged 96 Hrs 70°C	1500 PSI min
Elongation at Break	ASTM D412 DIE C	Original	400% min
		Aged 96 Hrs 70°C	320% min
Hardness	ASTM D2240	Original	70 Shore A max
		Aged 96 Hrs 70°C	+8 max
Compression Set	ASTM D395 B	22 Hrs 70°C	30% max
Tear Resistance	ASTM D624 DIE B	Original	400 lb/in min
Ozone Resistance	ASTM D1149	50pphm at 20% Strain, 100°F, 100 Hrs	No Cracks
Seawater Resistance	BSISO 1817; ASTM D471	28 days at 200°F	Hardness ±10 Max Shore A
Abrasion	ASTM D5363-04	Original	180 mm3 Max

The cylinder fenders shall be as specified:
Performance:
- Reaction: 49 kips/ft
- Energy Absorption: 53 ft-kips/ft
- Deflection: 50-percent O.D. Deflection

Geometry:
- Outside Diameter: ±1.0 inches
- Inside Diameter: ±0.5 inches

Length: ±0.5 inches
All edges shall be provided with 2-inch chamfer

All rubber energy absorbers shall be pre-conditioned by compressing them to the appropriate rated deflection at least three (3) times. Compression shall occur uniformly and symmetrically as to cause the energy unit to deform as intended by the Manufacturer. Verification testing shall be performed on 10% of units rounded up to the nearest whole number.

Test reports on verification testing shall include serial number and description of test units, location, and date of the test, printed name of the test supervisor, printed name and handwritten signature of the quality control manager, and date signed; table and graph of reaction and energy verses deflection; and signed third party certification of all test equipment (to be accurate within 1% +/-) dated no more than one year prior to test date.

During the verification test, compression shall be applied toward the top face of the fender, compression speed shall follow fender performing testing guidelines as outlined in current PIANC "Guidelines for the Design of Fender Systems – Appendix A – Procedure to Determine and Report the Performance of Marine Fenders" and shall be recorded during testing.

1. The fender is to be cycled for three times up to the designed deflection.
2. Let the fender stand for at least one hour.
3. A fourth deflection cycle shall then be performed using constant or decreasing velocity compression. The fourth cycle shall determine the fender performance.
4. The room temperature at the time of the test shall be recorded.
5. Correction factors for the fender performance shall be determined per PIANC for the temperature recorded at the time of the test.
6. All fenders shall achieve a performance with ±10% of the stated nominal design performance.

Contractor shall notify the engineer at least two weeks prior to verification testing. Verification tests shall be witnessed and documented in a brief report by a Professional Engineer registered within a state of the United States of America. Certificates shall be provided before the fenders arrive on the jobsite confirming that the tests were performed according to the current PIANC standards. The certificates shall also confirm that the results of the tests meet the energy and reaction requirements as specified above. If any unit fails the verification test it shall be rejected. If any unit fails, all units of the same size shall be verification tested at no additional expense to the owner.

UHMW Fender Panels. UHMW panels shall be of the size and dimension shown on the Drawings. Fender panels shall be yellow in color, made of 100% UHMW Polyethylene with 2.5% by weight UV-Stabilization compound, shall be partially or fully cross linked and have UV-Stabilizing dyes, and be suitable for long term exterior exposure. The fender panels shall conform to ASTM D3035 and F714 and the following requirements:

Test	Standard	Requirement
Specific Gravity	ASTM D792	0.94 min
Molecular Weight	N/A	3,000,000 min
Ultimate Tensile Strength	ASTM D638	4,000 PSI min
Izod Impact, Double Notch	ASTM D256A	18 ft-lb/in min
Coefficient of Friction	ASTM D1894	0.20 max
Abrasion Index (Carbon STL=100)	SAND SLURRY	18 max
Abrasion Index (CS17 Wheel, 1000G, 5000 Revolutions)	ASTM D4060	WGT loss <30mg

The UHMW Panels shall be drilled and counter bored for the mounting bolts as shown on the Drawings. The UHMW T-Slot shall be fabricated with tolerances to provide a snug tight fit. Contractor shall submit shop Drawings for review prior to fabrication of the UHMW Panels.

Ladder Rungs. All ladder rungs shall be rebar grade 60 ASTM A706. Welding of rebar shall be per AWS D1.4.

CONSTRUCTION REQUIREMENTS

535-3.01 IN-WATER WORK RESTRICTIONS. See Appendix B.

535-3.02 FABRICATION & ERECTION. All steel, welds, bolts, etc. shall be installed in accordance with Section 504 – Steel Structures.

All coating application shall be applied in accordance with Section 504 – Steel Structures.

All Piles shall be installed as shown on the Drawings and in accordance with Section 505 – Piling.

All Energy Absorbers and UHMW-PE Panels shall be constructed to the dimensions, limits, and installed at the locations shown on the Drawings.

Contractor shall verify fitment of fender panels with fender pin piles prior to shipment from the fabrication facility.

535-4.01 METHOD OF MEASUREMENT. Section 109. Steel or other material quantities shall not be measured separately for payment. Measurement shall be made for each fender unit installed and accepted and shall include furnishing and installing all field and shop fabricated materials, components and assemblies as shown on the Drawings, complete-in-place.

Painting or protective coating are considered incidental and will not be measured separately for payment.

535-5.01 BASIS OF PAYMENT. The contract price includes the cost of labor, materials, equipment and incidentals necessary for the Work, complete-in-place and accepted as shown on the Drawings.

Item 535(3) – Fenders: At the contract price shown on the bid schedule, for work, including furnishing, fabricating, and erecting, including all incidental work and materials required. The following items shall be considered subsidiary to the structure: all UHMW Panels, rubber energy absorbers, pin and sleeve pile fabrication and installation, rebar, welding, coatings, walers, tees, HSS, high strength chain and other materials, fabrication and installation required to complete the fender units as shown on the Drawings.

Payment will be made under:

Pay Item	**Pay Unit**
535(3) Fenders	Lump Sum

SECTION 642

CONSTRUCTION SURVEYING AND MONUMENTS

CONSTRUCTION REQUIREMENTS

642-3.01 GENERAL. *Delete the first sentence and replace with the following:* All Construction surveys shall be performed by or under the direct supervision of a surveyor licensed in the State of Alaska. Included in the cost of this item, the contractor shall furnish all stakes, templates, platforms, equipment, range markers, traffic control, straight-edges, and other devices and labor as may be required for checking and maintaining the required points, lines and grades and to lay out the work from the Control Points. It shall be the responsibility of the Contractor to maintain the control points until authorized to remove them. If such points are destroyed or disturbed they shall be re-established by the Contractor at no additional cost to the Owner.

Add the following after the first paragraph: An accurate method of horizontal control shall be established by the Contractor and approved by the Engineer before construction begins. The Contractor shall maintain the control system throughout the Project. If at any time the methods utilized fail to provide accurate location, the Contractor may be required to suspend work. The Contractor shall lay out the work from Owner established vertical control points and Contractor established horizontal control points and shall be responsible for all required measurements taken from these points.

Submit summary of experience and qualifications for the proposed surveyor and/or surveying techniques to the Engineer for approval prior to start of work.

Offshore alignment and positioning of the work is required on this project. Personnel used for survey control and layout shall have demonstrated prior experience in the construction of marine structures and placement of driven piles.

No pile driving activities shall be performed in the absence of survey control provided by the approved surveyor or surveying personnel.

642-5.01 BASIS OF PAYMENT. *Delete subsection in its entirety and replace with the following:* Construction surveying shall include furnishing all necessary personnel, equipment, and transportation, to accomplish the work, unless otherwise stated.

No separate payments shall be made for construction surveying. Cost associated with construction surveying shall be included in the general cost of the Work.

Add the following section:

SECTION 649

MARINE MAMMAL AND EIDER OBSERVATION

649-1.01 DESCRIPTION. The Contractor shall provide a sufficient number of qualified protected species observers (hereafter, "observers"), able to accurately identify protected species in Alaskan waters. The observers will be used to monitor the entire exclusion zone before and during all in-water construction and demolition activities.

649-2.01 OBSERVER QUALIFICATIONS. The following minimum requirements must be met to be qualified as an observer:

- Visual acuity in both eyes (correction permissible) sufficient for discernment of moving targets at the water's surface with ability to estimate target size and distance,
- Experience and ability to conduct field observations and collect data according to assigned protocols,
- Experience or training in the field identification of protected species, including the identification of behaviors, with ability to accurately identify protected species in Alaskan waters to species,
- Sufficient training, orientation or experience with the construction operation to provide for personal safety during observations,
- Writing skills sufficient to prepare a report of observations, and
- Ability to communicate orally, by radio or in person, with project personnel to provide real-time information on protected species observed in the area as necessary.

CONSTRUCTION REQUIREMENTS

649-3.01 OBSERVER EQUIPMENT.

Observer Equipment. Distance markers will be installed at the extent of the exclusion zone. All observers shall be equipped with the following:

- Binoculars,
- Range finder,
- GPS or map and compass,
- Two-way radio communication with construction foreman/superintendent, and
- A log of all activities, which will be made available to agencies upon request.

Observer Protocols. Protocols for observer methodology will be compiled based on the final project permits. Observers will follow these protocols as described in the final project permits and will consult with the Owner regarding any situations not covered in the protocols or permit language.

649-3.01 CONSTRUCTION OBSERVATION. Observers will be positioned such that the entire monitoring zone is visible to them. Monitoring and exclusion zone radii may vary depending on current activity and species present. All requirements set forth in the project permits shall be adhered to. The Contractor will obtain permission from landowners as needed for the use of observer stations well positioned to provide sufficient visibility. Observers shall have no other primary duty than to watch for and report on events related to protected species. The observer will have the authority to stop construction if a protected species is observed entering the exclusion zone. Observers shall not work more than 12 hours in a 24-hour period in shifts that last no longer than 4 hours with at least 1 hour break between shifts.

Observer Records. Observers will log daily observations including the environmental and behavioral observations required in the permits. These reports will be included with interim or final reports as required by the permitting agencies.

649-4.01 METHOD OF MEASUREMENT. Section 109.

649-5.01 BASIS OF PAYMENT. The Contract Price includes the cost of all labor, materials, training and equipment necessary to complete the Work described for Protected Species Observers.

Payment for this work will be made under:

Pay Item	Pay Unit
649(1) Marine Mammal and Eider Observation	Lump Sum

Add the following Section:

662 SECTION

ELECTRICAL POWER AND LIGHTING SYSTEM

662-1.01 DESCRIPTION.

A. The work includes power, signal, lighting and special systems required for the marine and uplands installation. Provide complete electrical systems as indicated on the electrical drawings, 'Planset E'. The following list identifies the major categories, systems, or items to be provided. Mention or omission of items in this paragraph shall not be construed or act to limit the performance of all work included on the drawings or required by the terms of the contract.
    1. Uplands work includes the following:
        a) Provide conductors where shown. Provide conduit from new generator building to three uplands light poles. All other work is included in this project.
        b) Provide power, lighting, and signal systems for the new generator building including a new standby generator and all accessories.
        c) Provide new light poles in the parking/staging areas as shown. The locations of the new light poles are shown on the planset. Remove and replace existing curb, gutter, asphalt, sidewalk, concrete, etc. as required to install the new light poles and their associated junction boxes.
        d) Provide all work shown on the uplands side of the abutment.
    2. Marine work starts at the abutment and includes the following:
        a) Provide two new light poles on dock. The locations of the new light poles are shown on the planset.
B. Basic materials and methods:
    1. Supporting devices for electrical components.
    2. Electrical identification.
    3. Concrete equipment bases.
    4. Touchup painting.
C. Grounding of electrical systems and equipment.
D. Conductors and cables.
E. Raceways and boxes.
F. Lighting control devices: Photoelectric relays, and multi-pole lighting relays and contactors.
G. Individually mounted enclosed switches and circuit breakers.
H. Panel boards, overcurrent protective devices, and associated auxiliary equipment rated 600 V and less.
I. Lighting fixtures.
J. Lighting poles.
K. Control Devices.
L. The generator set shall be a "turn key" item by one manufacturer complete with all additional equipment and requirements defined in the Plans and Specifications.

662-1.02 DEFINITIONS.

A. EMT: Electrical metallic tubing.
B. FMC: Flexible metal conduit.
C. LFMC: Liquidtight flexible metal conduit.
D. RNC: Rigid nonmetallic conduit.
E. LFNC: Liquidtight flexible nonmetallic conduit.
F. RSC: Rigid steel conduit.
G. PVC: Polyvinyl chloride.

H. GFCI: Ground-fault circuit interrupter.
I. Standby Rating: Power output rating equal to the power the generator set delivers continuously under normally varying load factors for a duration of the interruption of the normal source power. Average power output is 70% of the standby power rating. Typical operation is 200 hours per year with maximum expected usage of 500 hours per year. Standby power in accordance with ISO8528. Fuel stop power in accordance with ISO3046.
J. Steady-State Voltage Modulation: The uniform cyclical variation of voltage within the operational bandwidth, expressed in Hertz or cycles per second.
K. Equipment, Parts, and Materials: These terms are used to describe items to be purchased and installed on the project. These terms are used interchangeably. For example, if a requirement is stated for all materials it also applies to all parts and equipment as well.

662-1.03 SUBMITTALS.

A. Product Data: Provide catalog cut sheets showing configuration of the product, product dimensions, materials the product is made from, and all other information necessary to determine compliance with the specifications and features shown on the drawings for the product. Provide on the top of the catalog cut sheet where the product will be used on the project. For example a panel catalog cut sheet would be labeled “New Generator Building Panel G, keynote 14”. An arrow would show what size panel is being provided, what material it is made of, the number of spaces provided, etc. For a conductor catalog cut sheet, an arrow would be provided for each size conductor being provided with a description of the circuits these conductors would be used for; for example “underground feeders and branch circuits” or “indoor feeders and branch circuits”. Provide catalog cut sheets for all parts to be used on the project. Provide hard copies of the submittals bound and indexed by specification section. The materials to be submitted on are not listed in the specifications. Provide catalog cut sheets on all materials for the project.

B. Technical Literature: For equipment such as generators, transfer switches, load bank and similar equipment, provide additional technical literature in order to show compliance with the specifications for the equipment. At each location in the technical literature where compliance with a specification requirement is shown, provide an arrow in the technical literature with the specification section no., paragraph no., etc. that is being complied with. For example, for a factory test report that shows the voltage variation for a 50% step load increase, an arrow will be provided pointing to the voltage variation with the specification reference (662-2.08, 2.3, para C). This shall be done for each specification requirement. Provide whatever literature is needed to show compliance with the specifications. For the generator, provide detailed drawings of the generator, sub base tank both plan and elevation views. Also provide drawings for the automatic transfer switch, silencer, etc. Provide a schematic wiring drawing showing the interconnection of the wiring between the generator, automatic transfer switch, and load bank to allow the system operate as described on the drawing and in the specifications.

C. Installation, Operations, and Maintenance Manuals: For all materials, provide installation, operations, and maintenance manuals where a manufacturer has created such a manual. If the manual consists of one paragraph in a cat cut sheet with installation instructions and nothing on operations or maintenance, then the cat cut sheet is sufficient. Provide hard copies of the installation, operations, and maintenance manuals bound and indexed by specification section.

D. Extra Materials: Provide the extra materials shown on the drawings.

662-1.04 QUALITY ASSURANCE.

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency and marked for intended use.
B. The terms “Listed and Labeled”: As defined in the National Electrical Code, Article 100.
C. Listing and Labeling Agency Qualifications: A “Nationally Recognized Testing Laboratory” (NRTL) as defined in OSHA Regulation 1910.7.
D. Comply with NFPA 70.
E. Comply with UL 467.
F. Comply with NFPA 110.
G. Enclosed switches and circuit breakers shall comply with NEMA AB 1 and NEMA KS 1.
H. Panelboards shall comply with NEMA PB 2.
I. Dry-type transformers shall comply with IEEE C 57.12.91.

GENSET

A. Manufacturer Qualifications: Maintain a service center capable of emergency maintenance and repairs at the Project with 18 hours' maximum response time. Manufacturer shall be ISO9001 certified.
B. Dealer Qualifications: The dealer shall maintain qualified factory trained service personnel.
C. Testing Agency Qualifications: Testing agency as defined by OSHA in 29 CFR 1910.7 or a member company of the International Electrical Testing Association and that is acceptable to authorities having jurisdiction.
D. Source Limitations: Obtain packaged engine generator and auxiliary components specified in this Section and the automatic transfer switch in specified in Section 16415 through one source from a single manufacturer.
E. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction.
F. Comply with NFPA 70.
G. Engine Exhaust Emissions: Comply with applicable state and local government requirements.

662- 1.05 DELIVERY, STORAGE, AND HANDLING.

A. The generator, automatic transfer switch, automatic load bank, power panels, transformers, lighting, and all other material other than conduit shall be stored in a dry, heated location (between 50-80 degrees F) prior to being installed on the project site. Once equipment is installed in the generator building, storage building, and pursers building, these buildings shall be continuously heated and kept dry. Keep all equipment in protective wrappings until they are installed. After installation, protect equipment from damage, dirt, dust and other construction debris, moisture, and any other contaminants. Keep all equipment and materials in new condition throughout the project. Replace all damaged equipment and materials.

662- 1.06 COORDINATION.

A. Sequence, coordinate, and integrate installing electrical materials and equipment for efficient flow of the work.
B. Where electrical identification devices are applied to field-finished surfaces, coordinate installation of identification devices with completion of finished surface.
C. Coordinate size and location of concrete equipment bases. Cast anchor-bolt inserts into bases.
D. Coordinate installation of wall-mounting and structure-hanging supports.
E. Arrange for chases, slots, and openings in building structure during progress of construction to allow for electrical installations.

F. Coordinate connecting electrical systems with exterior underground utilities and services. Comply with requirements of governing regulations, utility requirements, and controlling agencies.

662-1.05 DEMOLITION.

A. None

662-2.01 MANUFACTURERS.

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the work include, but are not limited to, the manufacturers specified.

662-2.02 BASIC MATERIALS.

A. SUPPORTING DEVICES
   1. Material: Cold-formed steel, with corrosion-resistant coating acceptable to authorities having jurisdiction.
   2. Metal Items for use outdoors, in damp locations, or in corrosive environments: Hot-dip galvanized steel, or stainless steel. Metal items for use indoors shall be zinc plated. Painted Steel supporting devices shall not be used.
   3. Slotted-Steel Channel Supports: Flange edges turned toward web, and 9/16-inch diameter slotted holes at a maximum of 2 inches o.c., in webs.
      a) Coordinate with Drawings.
      b) Channel Thickness: Selected to suit structural loading.
      c) Fittings and Accessories: Products of the same manufacturer as channel supports.
   4. Raceway and Cable Supports: Manufactured clevis hangers, riser clamps, straps, threaded C-clamps with retainers, ceiling trapeze hangers, wall brackets, and spring-steel clamps or click-type hangers.
   5. Pipe Sleeves: ASTM A 53, Type E, Grade A, Schedule 40, galvanized steel, plain ends.
   6. Cable Supports for Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug for non-armored electrical cables in riser conduits. Plugs have number and size of conductor gripping holes as required to suit individual risers. Body constructed of malleable-iron casting with hot-dip galvanized finish.
   7. Expansion Anchors: Carbon-steel wedge or sleeve type.
   8. Toggle Bolts: All-steel springhead type.
   9. Powder-Driven Threaded Studs: Heat-treated steel.

B. ELECTRICAL IDENTIFICATION
   1. Identification Devices: A single type of identification product for each application category. Use colors prescribed by ANSI A13.1, NFPA 70, and these Specifications.
   2. Underground Warning Tape: Permanent, bright-colored, continuous-printed, vinyl tape with the following features:
      a) Not less than 6 inches wide by 4 mils thick.
      b) Compounded for permanent direct-burial service.
      c) Embedded continuous metallic strip or core.
      d) Printed legend that indicates type of underground line.

3. Tape Markers for Wire: Vinyl or vinyl-cloth, self-adhesive, wraparound type with preprinted numbers and letters.
4. Engraved-Plastic Labels, Signs, and Instruction Plates: Engraving stock, melamine plastic laminate punched or drilled for mechanical fasteners 1/16-inch minimum thickness for signs up to 20 sq. in. and 1/8-inch minimum thickness for larger sizes. Engraved legend in white letters on black background.
5. Exterior Warning and Caution Signs: Comply with 29 CFR, Chapter XVII, Part 1910.145. Weather-resistant, non-fading, preprinted, cellulose-acetate butyrate signs with 0.0396-inch, galvanized-steel backing, with colors, legend, and size appropriate to the application. 1/4-inch grommets in corners for mounting.
6. Fasteners for Nameplates and Signs: Self-tapping, stainless-steel screws or No. 10/32 stainless-steel machine screws with nuts and flat and lock washers.

C. CONCRETE EQUIPMENT BASES
1. Concrete Forms and Reinforcement Materials: As specified in Section 501 & 503.
2. Concrete: Use Class A concrete with reinforcement.

D. TOUCHUP PAINTING
1. For Equipment: Equipment manufacturer's paint selected to match installed equipment finish.
2. Galvanized Surfaces: Zinc-rich paint recommended by item manufacturer.

662-2.03 GROUNDING OF ELECTRICAL SYSTEMS AND EQUIPMENT.

A. Available Manufacturers:
1. Grounding Conductors, Cables, Connectors, and Rods:
a) Apache Grounding/Erico Inc.
b) Boggs, Inc.
c) Chance/Hubbell.
d) Copperweld Corp.
e) Erico Inc.; Electrical Products Group.
f) Framatome Connectors/Burndy Electrical.
g) ILSCO.
h) Kearney/Cooper Power Systems.
i) O-Z/Gedney Co.; a business of the EGS Electrical Group.
j) Raco, Inc.; Division of Hubbell.
k) Superior Grounding Systems, Inc.
l) Thomas & Betts, Electrical.

B. Grounding Conductors
1. For insulated conductors, comply with 662-2.04 Conductors and Cables.
2. Material: Copper, only.
3. Equipment Grounding Conductors: Insulated with green-colored insulation.
4. Grounding Electrode Conductors: Stranded cable.
5. Underground Conductors: Bare, tinned, stranded, unless otherwise indicated.
6. Bare Copper Conductors: Comply with the following:
a) Solid Conductors: ASTM B 3.
b) Assembly of Stranded Conductors: ASTM B 8.
c) Tinned Conductors: ASTM B 33.
7. Copper Bonding Conductors: As follows:
a) Bonding Cable: 28 kcmil, 14 strands of No. 17 AWG copper conductor, 1/4 inch in diameter.
b) Bonding Conductor: No. 4 or No. 6 AWG, stranded copper conductor.
c) Bonding Jumper: Bare copper tape, braided bare copper conductors, terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.
d) Tinned Bonding Jumper: Tinned-copper tape, braided copper conductors, terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.

8. Connector Products
    a) Comply with IEEE 837 and UL 467; listed for use for specific types, sizes, and combinations of conductors and connected items.
    b) Bolted Connectors: Bolted-pressure-type connectors, or compression type.
    c) Crimped Connectors: High compression type, in kit form, and selected per manufacturers written instructions.
9. Grounding Electrodes
    a) Ground Rods: Copper-clad and stainless steel.
    b) Ground Rods: Sectional type; stainless steel
    c) Size: 3/4 in diameter by 120 inches long.

662–2.04 CONDUCTORS AND CABLES.

A. Conductors and Cables (600 volt, or less)
    1. Available Manufacturers:
        a) Alcan Aluminum Corporation; Alcan Cable Div.
        b) General Cable Corporation.
        c) Senator Wire & Cable Company.
        d) Southwire Company.
        e) Okonite.
    2. Refer to 662-3.04 "Conductor and Insulation Applications" Article for insulation type, cable construction, and ratings.
    3. Conductor Material: Copper complying with NEMA WC 5; stranded for No. 8 AWG and larger.
    4. Conductor Insulation Types: Type THW, THHN-THWN, XHHW, USE, and SO complying with NEMA WC 5.
    5. Multi-conductor Cable for lighting circuits, controls, and other than data or fire alarm circuits: Provide copper conductors with XHHW insulation and an overall PVC jacket listed for direct burial. Install in conduit.
    6. Data Circuits. Provide cables shown on drawings.
    7. Fire Alarm Circuits. Provide cables and conductors shown on drawings.
B. CONNECTORS AND CABLES
    1. Available Manufacturers:
        a) AFC Cable Systems, Inc.
        b) AMP Incorporated/Tyco International.
        c) Hubbell/Anderson.
        d) O-Z/Gedney; EGS Electrical Group LLC.
        e) 3M Company; Electrical Products Division.
    2. Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated.

662–2.05 RACEWAYS AND BOXES.

A. Metal Conduit And Tubing
    1. Available Manufacturers:
        a) AFC Cable Systems, Inc.
        b) Alflex Inc.
        c) Anamet Electrical, Inc.; Anaconda Metal Hose.
        d) Electri-Flex Co.
        e) Grinnell Co./Tyco International; Allied Tube and Conduit Div.
        f) LTV Steel Tubular Products Company.
        g) Wheatland Tube Co.
    2. Rigid Steel Conduit: ANSI C80.1.
    3. Plastic-Coated Steel Conduit and Fittings: NEMA RN 1.

4. LFMC: Flexible steel conduit with PVC jacket, Federal Specification W-C-566C.
5. Fittings: NEMA FB 1; compatible with conduit and tubing materials. Provide malleable iron conduit bodies.

B. NONMETALLIC CONDUIT AND TUBING
1. Available Manufacturers:
   a) American International.
   b) Anamet Electrical, Inc.; Anaconda Metal Hose.
   c) Arnco Corp.
   d) Cantex Inc.
   e) Certainteed Corp.; Pipe & Plastics Group.
   f) Condux International.
   g) ElecSYS, Inc.
   h) Electri-Flex Co.
   i) Lamson & Sessions; Carlon Electrical Products.
   j) Manhattan/CDT/Cole-Flex.
   k) RACO; Division of Hubbell, Inc.
   l) Spiralduct, Inc./AFC Cable Systems, Inc.
2. RNC: NEMA TC 2, Schedule 80 PVC, and Federal Specification W-C-1094A.
3. RNC Fittings: NEMA TC 3; match to conduit or tubing type and material.
4. LFNC: UL 1660, Federal Specification WW-C-566C, and ANSI/NFPA 79. The conduit, including fittings shall remain flexible to 0 degrees Fahrenheit, or lower.
   a) Provide LFNC with a smooth inner core of seamless, flexible PVC bonded to an outer covering of flexible material (PVC). A layer of woven nylon mesh shall be located between the inner and outer layers for mechanical reinforcement. This conduit shall be listed for 600 volt use, outdoor use, and Class I, Div. 2, Class II, Div. 1, & Class III, Div. 1 locations. The outer covering shall be resistant to oil products, mild acids, and sunlight.

C. METAL WIREWAYS
1. Available Manufacturers:
   a) Hoffman.
   b) Square D.
   c) Walker.
   d) Airey-Thompson.
2. Material and Construction: 316 Stainless steel, NEMA 4X.
3. Fittings and Accessories: Include couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings to match and mate with wireways as required for complete system.
4. Select features, unless otherwise indicated, as required to complete wiring system and to comply with NFPA 70.
5. Wireway Covers: Hinged type.
6. Finish: Manufacturer's standard enamel finish.

D. BOXES, ENCLOSURES, AND CABINETS
1. Available Manufacturers:
   a) Cooper Crouse-Hinds; Div. of Cooper Industries, Inc.
   b) Hoffman.
   c) Hubbell, Inc.; Killark Electric Manufacturing Co.
   d) O-Z/Gedney; Unit of General Signal.
   e) RACO; Division of Hubbell, Inc.
   f) Thomas & Betts Corporation.
   g) Walker Systems, Inc.; Wiremold Company (The).
   h) Woodhead, Daniel Company; Woodhead Industries, Inc. Subsidiary.
2. Sheet Metal Outlet and Device Boxes: NEMA OS 1.
3. Cast-Metal Outlet and Device Boxes: cast iron then electrogalvanized with aluminum acrylic paint with gasketed cover.
4. Cast-Metal Pull and Junction Boxes: cast iron then electrogalvanized with aluminum acrylic paint with gasketed cover.

5. Conduit Bodies: malleable iron then electrogalvanized with aluminum acrylic paint with gasketed cover.
6. Hinged-Cover Enclosures: Type NEMA 4X 316 stainless steel outdoors, with continuous hinge cover and flush latch.
    a) Metal Enclosures: Steel, finished inside and out with manufacturer's standard enamel.
7. Cabinets: NEMA Type 4X, 316 stainless steel box outdoors with removable interior panel and removable front, finished inside and out with manufacturer's standard enamel. Hinged door in front cover with flush latch and concealed hinge. Key latch to match panelboards. Include metal barriers to separate wiring of different systems and voltage and include accessory feet where required for freestanding equipment.
8. FACTORY FINISHES
    a) Finish: For raceway, enclosure, or cabinet components, provide manufacturer's standard paint applied to factory-assembled surface raceways, enclosures, and cabinets before shipping.

662-2.06 WIRING DEVICES.

A. MANUFACTURERS

Wiring Devices:

(1) Bryant Electric, Inc./Hubbell Subsidiary.
(2) Eagle Electric Manufacturing Co., Inc.
(3) Hubbell Incorporated; Wiring Device-Kellems.
(4) Leviton Mfg. Company Inc.
(5) Pass & Seymour/Legrand; Wiring Devices Div.

B. RECEPTACLES

1. Straight-Blade-Type Receptacles: Comply with NEMA WD 1, NEMA WD 6, DSCC W-C-596G, and UL 498, 20 ampere, minimum.
2. Straight-Blade and Locking Receptacles: Industrial Heavy-Duty grade.
3. GFCI Receptacles: Straight blade, feed-through type, Industrial Heavy-Duty grade, with integral NEMA WD 6, Configuration 5-20R duplex receptacle; complying with UL 498 and UL 943. Design units for installation in a 2-3/4-inch- deep outlet box without an adapter.
4. Industrial Heavy-Duty Pin and Sleeve Devices: Comply with IEC 309-1.
    a) Pin and Sleeve receptacles and plugs shall be made by the manufacuturer as shown on the plans. They shall be rated at voltage, amperage, and configuration as shown on the drawings.

SWITCHES

1. Single- and Double-Pole Switches: Comply with DSCC W-C-896F and UL 20, 20 amp minimum or as noted..
2. Snap Switches: Industrial Heavy-Duty grade, quiet type, 20A, 120V.

WALL PLATES

1. Single and combination types to match corresponding wiring devices.
    a) On flush mounted j-boxes: Stainless steel.
    b) On surface mounted j-boxes: Galvanized steel.
    c) Material for Wet Locations: Cast aluminum with spring-loaded lift cover, and listed and labeled for use in "wet locations." Covers hinged to operate vertically.

FINISHES

Color:

a) Wiring Devices: Ivory, unless otherwise indicated or required by NFPA 70.

662–2.07 LIGHTING CONTROL DEVICES.

A. MANUFACTURERS
    1. Contactors and Relays:
        a) Automatic Switch Co.
        b) GE Lighting Controls.
        c) Hubbell Lighting, Inc.
        d) Siemens Energy and Automation, Inc.
        e) Square D Co.; Power Management Organization.
        f) Zenith Controls, Inc
    2. Photoelectric Relays:
        a) Allen-Bradley/Rockwell Automation.
        b) Area Lighting Research, Inc.
        c) Intermatic, Inc.
        d) Paragon Electric Co., Inc.
        e) Rhodes: M H Rhodes, Inc.
        f) SSAC, Inc.
        g) Tork, Inc.
B. GENERAL LIGHTING CONTROL DEVICE REQUIREMENTS
    1. Line-Voltage Surge Protection: Include in all 120, 277, and 480-V solid-state equipment. Comply with UL 1449 and with ANSI C62.41 for Category A locations.
C. PHOTOELECTRIC RELAYS
    1. Description: Solid state, with single-pole, double-throw dry contacts rated to operate connected relay or contactor coils or microprocessor input, and complying with UL 773A.
    2. Light-Level Monitoring Range: 0 to 3500 foot-candles with an adjustment for turn-on/turn-off levels.
    3. Time Delay: Prevents false operation.
    4. Outdoor Sealed Units: Weather tight housing, resistant to high temperatures and equipped with sun-glare shield and ice preventer.
D. MULTIPOLE CONTACTORS AND RELAYS
    1. Description: Electrically operated and held, and complying with UL 508 and NEMA ICS 2.
        a) Current Rating for Switching: UL listing or rating consistent with type of load served, including tungsten filament, inductive, and high-inrush ballast (ballasts with 15 percent or less total harmonic distortion of normal load current).
        b) Control Coil Voltage: Match control power source.

662–2.08 PACKAGED ENGINE GENERATORS

2.1 MANUFACTURERS

A. Available Manufacturers: The Genset and its accessories shall be provided by one manufacturer.

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following or equal:
    1. Cummins Onan Corp; Industrial Business Group.
    2. Caterpillar, Inc.; Engine Div.

2.2 ENGINE GENERATOR SET

A. Furnish a coordinated assembly of compatible components.
B. Output Connections: Three phase, four wire.
C. Safety Standard: Comply with ASME B15.1.

D. Nameplates: Each major system component is equipped with a conspicuous nameplate of component manufacturer. Nameplate identifies manufacturer of origin and address, and model and serial number of item.
E. Resistance to Seismic Forces: Supports for internal and external components, and fastenings for batteries, wiring, and piping are designed and constructed to withstand static or anticipated seismic forces, or both, in any direction. For each item, use a minimum force value equal to weight of item.
F. Limiting dimensions indicated for system components are not exceeded.
G. Power Output Ratings: Nominal ratings as indicated, with capacity as required to operate as a unit as evidenced by records of prototype testing.
H. Skid: Adequate strength and rigidity to maintain alignment of mounted components without depending on a concrete foundation. Skid is free from sharp edges and corners. Lifting attachments are arranged to facilitate lifting with slings without damaging any components.
I. Rigging Diagram: Inscribed on a metal plate permanently attached to skid. Diagram indicates location and lifting capacity of each lifting attachment and location of center of gravity.

2.3 GENERATOR-SET PERFORMANCE

A. Steady-State Voltage Operational Bandwidth: 4 percent of rated output voltage from no load to full load.
B. Steady-State Voltage Modulation Frequency: Less than 1 Hz.
C. Transient Voltage Performance: Not more than 10 percent variation for 50 percent step-load increase or decrease. Voltage recovers to remain within the steady-state operating band within three seconds.
D. Steady-State Frequency Operational Bandwidth: 0.5 percent of rated frequency from no load to full load.
E. Steady-State Frequency Stability: When system is operating at any constant load within rated load, there are no random speed variations outside the steady-state operational band and no hunting or surging of speed.
F. Transient Frequency Performance: Less than 5 percent variation for a 50 percent step-load increase or decrease. Frequency recovers to remain within the steady-state operating band within five seconds.
G. Output Waveform: At no load, harmonic content measured line to line or line to neutral does not exceed 5 percent total and 3 percent for single harmonics. The telephone influence factor, determined according to NEMA MG 1, shall not exceed 50.
H. Sustained Short-Circuit Current: For a three-phase, bolted short circuit at system output terminals, the system will supply a minimum of 250 percent of rated full-load current for not less than 10 seconds and then clear the fault automatically, without damage to any generator system component.
I. Start Time: Comply with NFPA 110, Type 10, system requirements.
J. The generator shall be standby rated at 275 kVA, 0.8 power factor, 277/480V, 3-phase, 4 wire, 60 Hertz, including radiator fan and all parasitic loads.

2.4 SERVICE CONDITIONS

A. Environmental Conditions: Engine generator system withstands the following environmental conditions without mechanical or electrical damage or degradation of performance capability:
    1. Ambient Temperature: -40 to +70 deg C.
    2. Relative Humidity: 0 to 95 percent, 30 to 60 deg C.
    3. Altitude: Sea level to 1000 feet (300 m).
    4. IP22 protection
    5. 5% salt spray, 48 hours, +38 deg C, 36.8V system voltage.
    6. Shock: withstand 15G

7. Sinusoidal vibration 4.3G's RMS, 24-1000Hz

2.5 ENGINE

A. General: Engine shall be diesel fueled, four cycle, water-cooled, while operating with nominal speed not exceeding 1800 RPM. The engine will utilize in-cylinder combustion technology.
B. Emissions: Engine shall comply with the State Emission regulations at the time of installation/commissioning. Actual engine emissions values must be in compliance with applicable EPA emissions standards per ISO 8178 - D2 Emissions Cycle at specified ekW / bHP rating. The in-cylinder engine technology must not permit unfiltered exhaust gas to be introduced into the combustion cylinder. Emissions requirements / certifications of this package: EPA TIER 3.
C. Comply with NFPA 37.
D. Fuel: Fuel oil, Grade DF-2.
E. Rated Engine Speed: 1800 rpm.
F. Maximum Piston Speed for Four-Cycle Engines: 2250 fpm (11.4 m/s).
G. Lubrication System: Pressurized by a positive-displacement pump driven from engine crankshaft. The following items are mounted on engine or skid:
    1. Filter and Strainer: Rated to remove 90 percent of particles 5 micrometers and smaller while passing full flow.
    2. Thermostatic Control Valve: Controls flow in system to maintain optimum oil temperature. Unit is capable of full flow and is designed to be fail-safe.
    3. Crankcase Drain: Arranged for complete gravity drainage to an easily removable container with no disassembly and without use of pumps or siphons or special tools or appliances.
H. Engine Fuel System: Comply with NFPA 37. System includes the following:
    1. Main Fuel Pump: Mounted on engine. Pump ensures adequate primary fuel flow under starting and load conditions.
    2. Relief/Bypass Valve: Automatically regulates pressure in fuel line and returns excess fuel to source.
I. Coolant Jacket Heater: Electric-immersion type, factory installed in coolant jacket system. Comply with NFPA 110 requirements for Level 1 equipment. Sized to insure that Genset will start within the specified time period and ambient conditions.

2.6 GOVERNOR

A. Type: Electronic governor providing isochronous frequency regulation within +/- 0.5% for any constant load between no load and full load. The regulator shall be a totally solid state design and environmentally sealed.

2.7 ENGINE COOLING SYSTEM

A. Description: Closed loop, liquid cooled, with radiator factory mounted on engine generator-set skid and integral engine-driven coolant pump.
B. Radiator: Rated for specified coolant.

C. Coolant: Solution of 50 percent ethylene-glycol-based antifreeze and 50 percent water, with anticorrosion additives as recommended by engine manufacturer.
D. Expansion Tank: Constructed of welded steel plate and equipped with gage glass and petcock.
E. Temperature Control: Self-contained, thermostatic-control valve modulates coolant flow automatically to maintain optimum constant coolant temperature as recommended by engine manufacturer.
F. Coolant Hose: Flexible assembly with inside surface of nonporous rubber and outer covering of aging-, ultraviolet-, and abrasion-resistant fabric.

1. Rating: 50-psig (345-kPa) maximum working pressure with 180 deg F (82 deg C) coolant, and noncollapsible under vacuum.
2. End Fittings: Flanges or steel pipe nipples with clamps to suit piping and equipment connections.

G. Provide a coolant heater.

2.8 FUEL SUPPLY SYSTEM

A. Comply with NFPA 30 and NFPA 37.
B. Sub-base Mounted Fuel Oil Tank: Factory-installed and -piped, listed and labeled fuel oil tank. Features include the following:
1. Mechanical reading fuel level gauge.
2. Capacity: Fuel for forty eight hours' continuous operation at 100 percent rated power output.
3. Locking Fill cap.
4. Containment Provisions: Provide with double wall.
5. Tank shall be isolated from generator vibration.
6. Provide vent piping of black iron pipe with rust inhibiting paint. Provide a vent for the fuel tank to the outside adjacent to the generator where directed by the ENGINEER.
7. Low fuel level alarm contacts and a fuel tank rupture alarm contact shall be provided.

C. The CONTRACTOR shall provide a full tank of diesel fuel for the completion of all testing.
D. Fuel system shall be integral with the engine. In addition to the standard fuel filters provided by the engine manufacturer, there shall also be installed a primary fuel filter/water separator in the fuel inlet line to the engine.
E. All fuel piping shall be black iron or flexible fuel hose rated for this service. No galvanized piping will be permitted. Flexible fuel lines shall be minimally rated for 300 deg F and 100 psi. Paint all piping with a rust resistant exterior paint. Prep per paint manufacturer’s instructions and recommendations including etch, primer, etc.

2.9 COMBUSTION-AIR-INTAKE SYSTEM

A. Air-Intake Silencer: Critical grade silencer, filter type provides filtration as recommended by engine manufacturer.
1. Mounting: factory installed, internally mounted within generator enclosure, at a location readily accessible for service. Complete with companion flanges, and flexible stainless steel exhaust fitting properly sized per manufacturer recommendations.

2.10 STARTING SYSTEM

A. Description: DC electric starting system with positive engagement, motor voltage by manufacturer and including the following items:
1. Components: Sized so they will not be damaged during a full engine-cranking cycle with ambient temperature at maximum specified in "Environmental Conditions" Paragraph in "Service Conditions" Article above.
2. Cranking Motor: Heavy-duty unit that automatically engages and releases from engine flywheel without binding.
3. Cranking Cycle: 60 seconds.
4. Battery: A lead-acid storage battery set of the heavy-duty diesel starting type. Battery voltage compatible with starting system. Adequate capacity within ambient temperature range specified in "Environmental Conditions" Paragraph in "Service Conditions" Article above to provide specified cranking cycle at least three times without recharging.
5. Battery Cable: Size as recommended by generator set manufacturer for cable length indicated. Include required interconnecting conductors and connection accessories.
6. Battery-Charging Alternator: Factory mounted on engine with solid-state voltage regulation and 35-A minimum continuous rating.

7. Battery Charger: Current-limiting, automatic-equalizing and float-charging type. Unit complies with UL 1236 and includes the following features:
    a. Operation: Equalizing-charging rate of 10 A is initiated automatically after battery has lost charge until an adjustable equalizing voltage is achieved at battery terminals. Unit then automatically switches to a lower float-charging mode and continues operating in that mode until battery is discharged again.
    b. Automatic Temperature Compensation: Adjusts float and equalizes voltages for variations in ambient temperature from minus 40 deg C to plus 60 deg C to prevent overcharging at high temperatures and undercharging at low temperatures.
    c. Automatic Voltage Regulation: Maintains output voltage constant regardless of input voltage variations up to plus or minus 10 percent.
    d. Ammeter and Voltmeter: Flush mounted in door. Meters indicate charging rates.
    e. Safety Functions: Include sensing of abnormally low battery voltage arranged to close contacts providing low battery voltage indication on control and monitoring panel. Also include sensing of high battery voltage and loss of ac input or dc output of battery charger. Either condition closes contacts that provide a battery-charger malfunction indication at system control and monitoring panel.
    f. Enclosure and Mounting: Mount within genset enclosure per Manufacturer recommendations.

2.12 CONTROL AND MONITORING

Provide a fully solid-state, microprocessor based, generator set control. The control panel shall be designed and built by the engine manufacturer. The control shall provide all operating, monitoring, and control functions for the generator set as follows:

A. Functional Description: When the mode-selector switch on the control and monitoring panel is in the automatic position, remote-control contacts in the automatic transfer switch initiate starting and stopping of the generator set. When the mode-selector switch is switched to the on position, the generator set manually starts. The off position of the same switch initiates generator-set shutdown. When the generator set is running, specified system or equipment failures or derangements automatically shut down the generator set and initiate alarms. Operation of a remote emergency-stop switch also shuts down the generator set. In the automatic mode, the generator shall have an adjustable cool down cycle that is initiated when the remote control contacts in the transfer switch open.
B. Configuration: Operating and safety indications, protective devices, basic system controls, and engine gauges are grouped on a common control and monitoring panel mounted on the generator set. Mounting method isolates the control panel from generator-set vibration.
C. Indicating and Protective Devices and Controls: Include the following:
    1. AC voltmeter.
    2. AC ammeter.
    3. AC frequency meter.
    4. DC voltmeter (alternator battery charging).
    5. Engine-coolant temperature gage.
    6. Engine lubricating-oil pressure gage.
    7. Running-time meter.
    8. Ammeter-voltmeter, phase-selector switch(es).
    9. Generator-voltage adjusting rheostat.
    10. H-O-A switch.
    11. Overspeed shutdown device.
    12. Coolant high-temperature shutdown device.
    13. Coolant low-level shutdown device.
    14. Oil low-pressure shutdown device.

15. Fuel tank high-level shutdown of fuel supply alarm.
16. Generator overload.

D. Supporting Items: Include sensors, transducers, terminals, relays, and other devices, and wiring required to support specified items. Locate sensors and other supporting items on engine, generator, or elsewhere as indicated. Where not indicated, locate to suit manufacturer's standard. Include the ability to operate six (6) programmable relay output signals, integral to the controller. The output relays shall be rated for 2A @ 30VDC.

E. Common Remote Strobe Light: Signal the occurrence of any events listed below without differentiating between event types. Locate weather proof strobe on the side of the generator building. Add an integral, audible alarm to the control panel of the generator.
   1. Engine high-temperature shutdown.
   2. Lube-oil low-pressure shutdown.
   3. Overspeed shutdown.
   4. Engine high-temperature prealarm.
   5. Lube-oil low-pressure prealarm.
   6. Fuel tank low level.
   7. Overcrank shutdown.
   8. Coolant low-temperature alarm.
   9. Coolant high-temperature alarm.
   10. Loss of coolant shutdown.
   11. Emergency stop depressed shutdown.
   12. Control switch not in auto position.
   13. Battery-charger malfunction alarm.
   14. Battery low-voltage alarm.

2.13 GENERATOR OVERCURRENT AND FAULT PROTECTION

A. Generator Circuit Breaker: Molded-case, electronic-trip type; 100 percent rated; complying with UL 489.
   1. Tripping Characteristic: Adjustable long-time and short-time delay and instantaneous.
   2. Trip Rating: Matched to generator thermal damage curve as closely as possible.
   3. Shunt Trip: Connected to trip breaker when generator set is shut down by other protective devices. See Plans for details.
   4. Mounting: Breaker shall be housed in an extension terminal box which is isolated from vibrations induced by the generator set. Provide with mechanical type lugs, sized for the circuit breaker feeders shown on the drawings, shall be supplied on the load side of the breaker.
   5. Provide generator circuit breaker with ground fault interruption capability.

2.14 GENERATOR, EXCITER, AND VOLTAGE REGULATOR

A. Comply with NEMA MG 1 and specified performance requirements.
B. Drive: Single bearing generator, generator shaft is directly connected to engine shaft. Exciter is rotated integrally with generator rotor.
C. Electrical Insulation: Class H.
D. Stator-Winding Leads: Brought out to terminal box to permit future reconnection for other voltages if required.
E. Construction prevents mechanical, electrical, and thermal damage due to vibration, overspeed up to 125 percent of rating, and heat during operation at 110 percent of rated capacity.
F. Excitation uses no slip or collector rings, or brushes, and is arranged to sustain generator output under short-circuit conditions as specified.
G. Enclosure: Drip proof, self-ventilated.
H. Instrument Transformers: Mounted within generator enclosure.

I. Voltage Regulator: Solid-state type, separate from exciter, providing performance as specified.
    1. Adjusting rheostat on control and monitoring panel provides plus or minus 5 percent adjustment of output- voltage operating band.
J. Strip Heater: Thermostatically controlled unit arranged to maintain stator windings above dew point.
K. Windings: Two-thirds pitch stator winding and fully linked amortisseur winding.
L. Subtransient Reactance: 12 percent, maximum.

2.15 FINISHES

A. Generator Enclosure: All surfaces thoroughly cleaned prior to coatings. Manufacturer's standard enamel over corrosion-resistant pretreatment and compatible standard primer. Manufacturer's standard color.

2.16 SOURCE QUALITY CONTROL

A. Factory Tests: Include prototype testing.
B. Prototype Testing: Performed on a separate engine generator set using same engine model, constructed of identical or equivalent components and equipped with identical or equivalent accessories.
    1. Generator Tests: Comply with IEEE 115.
    2. Components and Accessories: Items furnished with installed unit that are not identical to those on tested prototype have been tested to demonstrate compatibility and reliability.
C. Project-Specific Equipment Tests: Factory test engine generator set and other system components and accessories before shipment. Perform tests at rated load and power factor. Include the following tests.
    1. Full load run.
    2. Maximum power.
    3. Voltage regulation.
    4. Transient and steady-state governing.
    5. Single-step load pickup.
    6. Safety shutdown.
D. Observation of Factory Tests: Provide 14 days advance notice of tests and opportunity for observation of test by OWNER's representatives.
E. Report factory test results within 10 days of completion of test.

662–2.09 INDIVIDUALLY MOUNTED ENCLOSED SWITCHES AND CIRCUIT BREAKERS.

A. MANUFACTURERS
    1. Fusible Switches:
        a) General Electric Co.; Electrical Distribution & Control Division.
        b) Siemens Energy & Automation, Inc.
        c) Square D Co.
    2. Molded-Case Circuit Breakers:
        a) Eaton Corp.; Cutler-Hammer Products.
        b) General Electric Co.; Electrical Distribution & Control Division.
        c) Klockner-Moeller.
        d) Siemens Energy & Automation, Inc.
        e) Square D Co.
B. ENCLOSED SWITCHES
    1. Enclosed, Non-fusible Switch: NEMA KS 1, Type HD, with lockable handle.
C. ENCLOSED CIRCUIT BREAKERS

1. Molded-Case Circuit Breaker: NEMA AB 1, with interrupting capacity to meet available fault currents.
    a) Thermal-Magnetic Circuit Breakers: Inverse time-current element for low-level overloads and instantaneous magnetic trip element for short circuits. Adjustable magnetic trip setting for circuit-breaker frame sizes 250 A and larger.
2. Molded-Case Circuit-Breaker Features and Accessories: Standard frame sizes, trip ratings, and number of poles.
    a) Lugs: Mechanical style suitable for number, size, trip ratings, and material of conductors.
    b) Shunt Trip: 120-V trip coil energized from separate circuit, set to trip at 75 percent of rated voltage.

D. ENCLOSURES
1. NEMA AB 1 and NEMA KS 1 to meet environmental conditions of installed location.
    a) Outdoor Locations: NEMA 4X, stainless steel.

662–2.10 PANELBOARDS.

A. MANUFACTURERS
1. Panelboards, Overcurrent Protective Devices, Controllers, Contactors, and Accessories:
    a) General Electric Co.; Electrical Distribution & Control Div.
    b) Siemens Energy & Automation, Inc.
    c) Square D Co.

B. FABRICATION AND FEATURES
1. Front: Secured to box with concealed trim clamps. For surface-mounted fronts, match box dimensions. Mount in NEMA 4X stainless steel enclosure outdoors and NEMA 1 enclosure indoors.
2. Finish: Manufacturer's standard enamel finish over corrosion-resistant treatment or primer coat.
3. Directory Card: With transparent protective cover, mounted inside metal frame, inside panelboard door.
4. Bus: Hard-drawn copper, 98 percent conductivity.
5. Main and Neutral Lugs: Mechanical type suitable for use with conductor material.
6. Equipment Ground Bus: Adequate for feeder and branch-circuit equipment ground conductors, bonded to box.
7. Future Devices: Mounting brackets, bus connections, and necessary appurtenances required for future installation of devices.

C. PANELBOARDS
1. Doors: Front mounted; secured with vault-type latch with tumbler lock; keyed alike.
2. Provide panel including overcurrent protective devices with a 10,000 amps interrupting capacity min. Provide a higher AIC rating where shown on the drawings.
3. Main Overcurrent Protective Devices: Circuit breaker.
4. Branch overcurrent protective devices shall be one of the following:
    a) Circuit-Breakers: Bolt-on circuit breakers, replaceable without disturbing adjacent units.

D. OVERCURRENT PROTECTIVE DEVICES
1. Molded-Case Circuit Breaker: NEMA AB 1, with interrupting capacity to meet available fault currents shown on the drawings or 10,000 amps whichever is greater.
    a) Thermal-Magnetic Circuit Breakers: Inverse time-current element for low-level overloads, and instantaneous magnetic trip element for short circuits. Adjustable magnetic trip setting for circuit-breaker frame sizes 250 A and larger.
    b) Adjustable Instantaneous-Trip Circuit Breakers: Magnetic trip element with front-mounted, field-adjustable trip setting.

2. Molded-Case Circuit-Breaker Features and Accessories. Standard frame sizes, trip ratings, and number of poles.
    a) Lugs: Mechanical style, suitable for number, size, trip ratings, and material of conductors.

662–2.11 DRY-TYPE TRANSFORMERS 600 V AND LESS.

A. MANUFACTURERS
    1. Available Manufacturers:
        a) Acme Electric Corporation; Power Distribution Products Division.
        b) Challenger Electrical Equipment Corp.; a division of Eaton Corp.
        c) Federal Pacific Transformer Company; Division of Electro-Mechanical Corp.
        d) GE Electrical Distribution & Control.
        e) Siemens Energy & Automation, Inc.
        f) Square D/Groupe Schneider NA.
B. MATERIALS
    1. Description: Factory-assembled and -tested, air-cooled units for 60-Hz service.
    2. Cores: Grain-oriented, non-aging silicon steel.
    3. Coils: Continuous windings without splices, except for taps.
        a) Internal Coil Connections: Brazed or pressure type.
        b) Coil Material: Copper.
C. DISTRIBUTION TRANSFORMERS
    1. Comply with NEMA ST 20, and list and label as complying with UL 1561.
    2. Cores: One leg per phase.
    3. Enclosure: Stainless steel, ventilated, raintight, with marine rating, NEMA 250, Type 3R outdoors and NEMA 250, Type 1 indoors.
    4. Insulation Class: 220 deg C, UL-component-recognized insulation system with a maximum of 150 deg C rise above 40 deg C ambient temperature.
    5. Taps for Transformers 25 kVA and Larger: Two 2.5 percent taps above and two 2.5 percent taps below normal full capacity.
D. CONTROL AND SIGNAL TRANSFORMERS
    1. Description: Self-cooled, two-winding dry type, rated for continuous duty, complying with NEMA ST 1, and listed and labeled as complying with UL 506.
    2. Ratings: Continuous duty. If rating is not indicated, provide at least 50 percent spare capacity above connected peak load.
E. SOURCE QUALITY CONTROL
    1. Test and inspect transformers according to IEEE C57.12.91.

662–2.12 LIGHTING FIXTURES.

A. MANUFACTURERS
    1. Keynote 1 on the Electrical Site Plan drawing and keynotes 22 and 23 on the Equipment List and Panel G Schedule drawing characterize the luminaires with features desired for this facility. Substitutions of equal or better quality with the same salient features will be considered.
B. LUMINAIRES, GENERAL
    1. Comply with IESNA RP-8 for parameters of lateral light distribution patterns indicated for luminaires
    2. LED Fixtures: Comply with UL 1598. Where LER is specified, test according to NEMA LE 5 and NEMA LE 5A as applicable.
    3. Metal Parts: Free of burrs and sharp corners and edges.
    4. Sheet Metal Components: Corrosion-resistant aluminum, unless otherwise indicated. Form and support to prevent warping and sagging.

5. Housings: Rigidly formed, weather- and light-tight enclosures that will not warp, sag, or deform in use. Provide filter/breather for enclosed luminaires.
6. Doors, Frames, and Other Internal Access: Smooth operating, free of light leakage under operating conditions, and designed to permit relamping without use of tools. Designed to prevent doors, frames, lenses, diffusers, and other components from falling accidentally during relamping and when secured in operating position. Doors shall be removable for cleaning or replacing lenses. Designed to disconnect ballast when door opens.
7. Outdoor Exposed Hardware Material: Stainless steel, or as specified on the design drawings.
8. Plastic Parts: High resistance to yellowing and other changes due to aging, exposure to heat, and UV radiation.
9. Reflecting surfaces shall have minimum reflectance as follows, unless otherwise indicated:
    a) White Surfaces: 85 percent.
    b) Specular Surfaces: 83 percent.
    c) Diffusing Specular Surfaces: 75 percent.
10. Lenses and Refractors Gaskets: Use heat- and aging-resistant resilient gaskets to seal and cushion lenses and refractors in luminaire doors.

C. LED BALLASTS
1. General: Comply with NEMA C82.4 and UL 1029. Shall include the following features, unless otherwise indicated:
    a) Type: Constant-wattage autotransformer or regulating high-power-factor type.
    b) Minimum Starting Temperature: Minus 22 deg F.
    c) Normal Ambient Operating Temperature: 104 deg F.
    d) Open-circuit operation will not reduce average life.
    e) 120-277V LED drivers.

D. FIXTURE SUPPORT COMPONENTS
1. Comply with Basic Electrical Materials and Methods for channel- and angle-iron supports and nonmetallic channel and angle supports.

E. FACTORY FINISHES
1. Finish: Manufacturer's standard paint applied to factory-assembled and -tested luminaire before shipping.

F. SOURCE QUALITY CONTROL
1. Factory test fixtures with ballasts and lamps; certify results for isofootcandle curves, zonal lumen, average and minimum ratios, and electrical and energy-efficiency data for ballasts.

662–2.13 LIGHTING POLES.

A. MANUFACTURERS
1. Available Manufacturers:
    a) Ameron Pole Products; Division of Ameron International Corp.
    b) Garmire Iron Works
    c) GE Lighting Systems.
    d) Whatley, W. J. Inc.
    e) Kim Lighting Inc.

B. PERFORMANCE REQUIREMENTS
1. Dead Load: Weight of luminaire and its horizontal and vertical supports, and supporting structure, applied as stated in AASHTO LTS-3.
2. Live Load: Single load of 500 lbf, distributed as stated in AASHTO LTS-3.
3. Ice Load: Load of 3 lbf/sq. ft., applied as stated in AASHTO LTS-3.
4. Wind Load: Pressure of wind on standard and luminaire, calculated and applied as stated in AASHTO LTS-3.

a) Wind speed for calculating wind load for poles 50 feet in height or less is 110 mph.

C. POLES, GENERAL
1. Description: Comply with AASHTO LTS-3 in structural design of poles.
2. Wind-Load Strength of Poles: Adequate at indicated heights above grade without failure, permanent deflection, or whipping in steady winds of speed indicated in Performance Requirements Article, with a gust factor of 1.3.
   a) Strength Analysis: For each pole, multiply the actual equivalent projected area of luminaires and brackets by a factor of 1.1 to obtain the equivalent projected area to be used in pole selection strength analysis.
3. Luminaire Attachment: Structural supports to comply with luminaire mounting requirements.
4. Finish: Match finish of pole and support structure on arm, bracket, and tenon mount materials. Provide TNEMEC paint over hot dipped galvanized pole applied per the TNEMEC process.
5. Mountings, Fasteners, and Appurtenances: Corrosion-resistant items compatible with support components.
   a) Materials: Shall not cause galvanic action at contact points.
   b) Mountings: Correctly position luminaire attachment to provide indicated light distribution.
   c) Anchor Bolts, Leveling Nuts, Bolt Caps, and Washers: Hot-dip galvanized after fabrication unless stainless-steel items are indicated.
   d) Anchor-Bolt Template: Plywood or steel.

D. STEEL POLES
1. Poles: Comply with ASTM A 500, Grade B, carbon steel with a minimum yield of 46,000 psig; 1-piece construction up to 40 feet in length with access handhole in pole wall.
   a) Shape: Square, straight.
2. Handhole: Weathertight, 3-by-5-inch with cover for access, locate 18 inches above base plate.
3. Grounding and Bonding Lugs: Welded ½-inch threaded lug, complying with requirements in Grounding and Bonding, listed for attaching grounding and bonding conductors and accessible through handhole.
4. Brackets for Luminaires: Detachable, with pole and adapter fittings. Adapter fitting welded to pole and bracket, and then bolted together with stainless-steel bolts.
5. Paint over Galvanized Finish: After fabrication, hot-dip galvanize complying with ASTM A 123/A 123M. Then paint poles flat black using the TNEMEC painting process or equal.

662–2.14 CONTROL DEVICES.

A. RELAYS
1. Magnetic Control Relays: Machine Tool type relays with 600 volt, 10 ampere rated contacts. Provide capability to accept pneumatic timing and latching attachments. Provide with NEMA or IEC rating.
2. Interposing Relays: Direct drive relays with 300 volt, 5 ampere, minimum rated contacts. Relays shall be rail mounted.

B. INDICATING LIGHTS, PUSHBUTTONS AND CONTROL SWITCHES
1. Push-Button Stations, Pilot Lights, and Selector Switches: NEMA ICS 2, 30.5 mm, watertight/oil tight, corrosion resistant, heavy-duty type for non-hazardous outdoor and wet locations.
2. Indicating Lights: All pushbuttons shall be adapted to the voltage utilized. All shall utilize LED lamps with Push-To-Test feature.
3. Pushbuttons: All control switches shall have full guard, unless noted otherwise.
4. Selector Switches: All control switches shall have gloved hand knobs.

5. Emergency Stop & Lockout Pushbuttons: All pushbuttons shall be “push-pull” style requiring rotation to the pulled position. The heads shall be Red, mushroom style. Provide a padlock for the lockout position.

C. CONTROL PENDANTS
   1. Pushbutton style pendant, 8 buttons, momentary contact, 1 speed.
   2. Enclosure safety insulated, jam resistant, neoprene.

662-2.15 TRANSFER SWITCHES

2.1 MANUFACTURERS

A. Manufacturer shall be the same as for the genset.
B. Manufacturers: Subject to compliance with requirements, provide products by one of the following or equal:
   1. Conventional Transfer Switches:
      a. Cummins Onan; Cummins Power Generation.
b. Caterpillar, Inc.; Engine Division.

2.2 GENERAL TRANSFER-SWITCH PRODUCT REQUIREMENTS

A. Indicated Current Ratings: Apply as defined in UL 1008 for continuous loading and total system transfer, including tungsten filament lamp loads not exceeding 30 percent of switch ampere rating, unless otherwise indicated.
B. Tested Fault-Current Closing and Withstand Ratings: Adequate for duty imposed by protective devices at installation locations in Project under the fault conditions indicated, based on testing according to UL 1008.
   1. Where Transfer Switch Includes Internal Fault-Current Protection: Rating of switch and trip unit combination exceeds indicated fault-current value at installation location.
C. Annunciation, Control, and Programming Interface Components: Devices at transfer switches for communicating with remote programming devices, annunciators, or annunciator and control panels have communications capability matched with remote device.
D. Solid-State Controls: Repetitive accuracy of all settings is plus or minus 2 percent or better over an operating temperature range of minus 20 to plus 70 deg C.
E. Resistance to Damage by Voltage Transients: Components meet or exceed voltage-surge withstand capability requirements when tested according to IEEE C62.41. Components meet or exceed voltage-impulse withstand test of NEMA ICS 1.
F. Neutral Terminal: Solid and fully rated, unless otherwise indicated.
G. Enclosures: General-purpose NEMA 250, Type 1, complying with NEMA ICS 6; UL 508, unless otherwise indicated.
H. Heater: Equip switches exposed to outdoor temperature and humidity conditions, and other units indicated, with an internal heater. Provide thermostat within enclosure to control heater.
I. Factory Wiring: Train and bundle factory wiring and label consistent with Shop Drawings, either by color code or by numbered or lettered wire and cable tape markers at terminations.
   1. Designated Terminals: Pressure type suitable for types and sizes of field wiring indicated.
   2. Power-Terminal Arrangement and Field-Wiring Space: Suitable for top, side, or bottom entrance of feeder conductors as indicated.
   3. Control Wiring: Equipped with lugs suitable for connection to terminal strips.
J. Electrical Operation: Accomplish by a nonfused, momentarily energized solenoid or electric-motor-operated mechanism, mechanically and electrically interlocked in both directions.
K. Switch Characteristics: Designed for continuous-duty repetitive transfer of full-rated current between active power sources.
   1. Limitation: Switches using molded-case switches or circuit breakers or insulated-case circuit-breaker components are not acceptable.
   2. Switch Action: Double throw; mechanically held in both directions.

3. Contacts: Silver composition or silver alloy for load-current switching. Conventional automatic transfer-switch units rated 225 A and greater have separate arcing contacts.

2.3 AUTOMATIC TRANSFER SWITCHES

A. Comply with Level 1 equipment according to NFPA 110.
B. Switching Arrangement: Double-throw type, with a delay at neutral position pause or intermediate position stop during normal functioning.
C. Manual Switch Operation: Under load, with door closed and with either or both sources energized. Transfer time is the same as for electrical operation. Control circuit automatically disconnects from electrical operator during manual operation.
D. Manual Switch Operation: Unloaded. Control circuit automatically disconnects from electrical operator during manual operation.
E. Signal-before-Transfer Contacts: A set of normally open/normally closed dry contacts operates in advance of retransfer to normal source. Interval is adjustable from 1 to 30 seconds.
F. Transfer Switches Based on Molded-Case-Switch Components: Comply with NEMA AB 1, UL 489, and UL 869A.
G. Delayed (programmed) transition: ATS shall have an adjustable programmed (delayed) transition transfer switch per NEMA MG-1. Pause shall be adjustable. Time delay occurs for both transfer directions.

2.4 AUTOMATIC TRANSFER SWITCH FEATURES

A. Undervoltage Sensing for Each Phase of Normal Source: Senses low phase-to-ground voltage on each phase. Pickup voltage is adjustable from 85 to 100 percent of nominal, and dropout voltage is adjustable from 70 to 90 percent of pickup value. Factory set for pickup at 90 percent and dropout at 80 percent.
B. Time delay for override of normal-source voltage sensing delays transfer and engine start signals. Adjustable from zero to ten seconds, and factory set for three second.
C. Voltage/Frequency Lockout Relay: Prevents premature transfer to generator set. Pickup voltage is adjustable from 85 to 100 percent of nominal. Factory set for pickup at 90 percent. Pickup frequency is adjustable from 90 to 100 percent of nominal. Factory set for pickup at 95 percent.
D. Time Delay for Retransfer to Normal Source: Adjustable from 0 to 60 minutes; factory set for 10 minutes. Provides automatic defeat of delay on loss of voltage or sustained undervoltage of emergency source, provided normal supply has been restored.
E. Test Switch: Simulates normal-source failure.
F. Switch-Position Pilot Lights: Indicate source to which load is connected.

G. Source-Available Indicating Lights: Supervise sources via transfer-switch, normal- and emergency-source sensing circuits.
    1. Normal Power Supervision: Green light with nameplate engraved "Normal Source Available."
    2. Emergency Power Supervision: Red light with nameplate engraved "Emergency Source Available."
H. Unassigned Auxiliary Contacts: Two normally open single-pole, double-throw contacts for each switch position, rated 10 A at 240-V ac.
I. Transfer Override Switch: Overrides automatic retransfer control so automatic transfer switch will remain connected to emergency power source regardless of condition of normal source. Pilot light indicates override status.
J. Engine Starting Contacts: One isolated, normally closed and one isolated, normally open, rated 10 A at 32-V dc minimum.

K. Engine Shutdown Contacts: Time delay adjustable from zero to five minutes; factory set for five minutes. Initiates shutdown at remote engine-generator controls after retransfer of load to normal source.
L. Engine-Generator Exerciser: Solid-state, programmable-time switch starts engine-generator set and transfers load to it from normal source for a preset time, then retransfers and shuts down engine after a preset cool-down period. Initiates exercise cycle at preset intervals adjustable from 7 to 28 days. Running periods are a minimum of 15 minutes. Exerciser features include the following:
    1. Exerciser Transfer Selector Switch: Permits selection of exercise with and without load transfer.
    2. Integral battery operation of time switch when normal control power is not available.

2.5 FINISHES

A. Enclosures: Manufacturer's standard enamel over corrosion-resistant pretreatment and primer.

2.6 SOURCE QUALITY CONTROL

A. Factory Test Components, Assembled Switches, and Associated Equipment: Ensure proper operation. Check transfer time and voltage, frequency, and time-delay settings for compliance with specified requirements. Perform dielectric strength test complying with NEMA ICS 1.

662– 2.17 VIDEO CAMERA SYSTEM.

A. None.

662– 3.01 ELECTRICAL EQUIPMENT INSTALLATION.

A. Materials and Components: Install level, plumb, and parallel and perpendicular to other structural systems and components, unless otherwise indicated.
B. Equipment: Install to facilitate service, maintenance, and repair or replacement of components. Connect for ease of disconnecting, with minimum interference with other installations.
C. Right of Way: Give to raceways and piping systems installed at a required slope.

662– 3.02 BASIC METHODS.

A. ELECTRICAL SUPPORTING DEVICE APPLICATION
    1. Damp Locations and Outdoors: Hot-dip galvanized materials, or stainless steel materials, U-channel system components.
    2. Dry Locations: Steel materials.
    3. Support Clamps for PVC Raceways: Click-type clamp system.
    4. Selection of Supports: Comply with manufacturers written instructions.
    5. Strength of Supports: Adequate to carry present and future loads, times a safety factor of at least four; minimum of 200-lb design load.
B. SUPPORT INSTALLATION
    1. Install support devices to securely and permanently fasten and support electrical components.
    2. Install individual and multiple raceway hangers and riser clamps to support raceways. Provide U-bolts, clamps, attachments, and other hardware necessary for hanger assemblies and for securing hanger rods and conduits.

3. Support parallel runs of horizontal raceways together on trapeze- or bracket-type hangers.
4. Size supports for multiple raceway installations so capacity can be increased by a 25 percent minimum in the future.
5. Support individual horizontal raceways with separate, malleable-iron pipe hangers or clamps.
6. Install 1/4-inch diameter or larger threaded steel hanger rods, unless otherwise indicated.
7. Arrange supports in vertical runs so the weight of raceways and enclosed conductors is carried entirely by raceway supports, with no weight load on raceway terminals.
8. Simultaneously install vertical conductor supports with conductors.
9. Separately support cast boxes that are threaded to raceways and used for fixture support. Support sheet metal boxes directly from the structure.
10. Install metal channel racks for mounting cabinets, panelboards, disconnect switches, control enclosures, pull and junction boxes, transformers, and other devices, unless components are mounted directly to structural elements of adequate strength.
11. Securely fasten electrical items and their supports to structure, unless otherwise indicated. Perform fastening according to the following unless other fastening methods are indicated:
    a) Wood: Fasten with wood screws or screw-type nails.
    b) New Concrete: Concrete inserts with machine screws and bolts.
    c) Steel: Welded threaded studs or spring-tension clamps on steel.
        (1) Field Welding: Comply with AWS D1.1.
    d) Welding to steel structure may be used only for threaded studs, not for conduits, pipe straps, or other items.
    e) Light Steel: Sheet-metal screws.
    f) Fasteners: Select so the load applied to each fastener does not exceed 25 percent of its proof-test load.

C. IDENTIFICATION MATERIALS AND DEVICES

1. Provide identification labels on all equipment that has an enclosure (panels, transformers, generator, transfer switches, load bank, battery charger, contactors, etc., all receptacles, all data jacks, data racks, and all other equipment other than luminaires, and conduit. Label all receptacles with the panel name and circuit number that feeds it. Label all junction box covers with the panel name and circuit nos. of the wiring contained in them. Label all fire alarm junction boxes with the circuits that are inside them. Install at locations for most convenient viewing without interference with operation and maintenance of equipment. In all vaults and enclosures other than panels, label all conductors with the panel no and circuit no that feeds them. For the load bank junction, ATS, etc., label the conductors according to the wiring diagram for the system.
2. Coordinate names, abbreviations, colors, and other designations used for electrical identification with corresponding designations indicated in the Contract Documents or required by codes and standards. Use consistent designations throughout Project.
3. Self-Adhesive Identification Products: Clean surfaces before applying.
4. Install continuous underground plastic markers during trench backfilling, for exterior underground power, control, signal, and communication lines located directly above power and communication lines. Locate 6 to 8 inches below finished grade, unless shown otherwise in the drawings. If width of multiple lines installed in a common trench or concrete envelope does not exceed 16 inches, overall, use a single line marker.
5. Color-code 208/120-V system secondary service, feeder, and branch-circuit conductors throughout the secondary electrical system as follows:
    a) Phase A: Black.
    b) Phase B: Red.
    c) Phase C: Blue.

6. Color-code 480/277-V system secondary service, feeder, and branch-circuit conductors throughout the secondary electrical system as follows:
    a) Phase A: Yellow.
    b) Phase B: Brown.
    c) Phase C: Orange.
7. Install warning, caution, and instruction signs where required to comply with 29 CFR, Chapter XVII, Part 1910.145, and where needed to ensure safe operation and maintenance of electrical systems and of items to which they connect. Install engraved plastic-laminated instruction signs with approved legend where instructions are needed for system or equipment operation. Install metal-backed butyrate signs for outdoor items.
8. Install engraved-laminated emergency-operating signs with white letters on red background with minimum 3/8-inch high lettering for emergency instructions on power transfer, load shedding, and other emergency operations.

D. CONCRETE BASES
1. Construct concrete bases of dimensions indicated, but not less than 4 inches larger, in both directions, than supported unit. Follow supported equipment manufacturer's anchorage recommendations and setting templates for anchor-bolt and tie locations, unless otherwise indicated. Use Class A concrete with reinforcement.

E. PAINTING
1. Paint all surface mounted conduit and junction boxes to match surface they are mounted to.

662– 3.03 GROUNDING.

A. APPLICATION
1. Use only copper conductors for both insulated and bare grounding conductors in direct contact with earth, concrete, masonry, crushed stone, and similar materials.
2. In raceways, use insulated equipment grounding conductors.
3. Crimp Connections: Use for connections to structural steel and for underground connections.
4. Equipment Grounding Conductor Terminations: Use bolted pressure clamps.
5. Underground Grounding Conductors: Use tinned-copper conductor, No. 2/0 AWG minimum. Bury at least 24 inches below grade.
6. Grounding Conductors on Dock: Use insulated tinned-copper conductor, installed in conduit, No. 2/0 AWG minimum.

B. EQUIPMENT GROUNDING CONDUCTORS
1. Comply with NFPA 70, Article 250, for types, sizes, and quantities of equipment grounding conductors, unless specific types, larger sizes, or more conductors than required by NFPA 70 are indicated.
2. Install equipment grounding conductors in feeders and circuits where shown in the drawings.
3. Nonmetallic Raceways: Install an equipment-grounding conductor in nonmetallic raceways.

C. INSTALLATION
1. Ground Rods: Install at least three rods spaced at least one-rod length from each other and located at least the same distance from other grounding electrodes.
    a) Drive ground rods until tops are 2 inches below finished floor or final grade, unless otherwise indicated.
    b) Interconnect ground rods with grounding electrode conductors. Use crimp connectors. Make connections without exposing steel or damaging copper coating.
2. Grounding Conductors: Route along shortest and straightest paths possible, unless otherwise indicated. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.

3. Bonding Straps and Jumpers: Install so vibration by equipment mounted on vibration isolation hangers and supports is not transmitted to rigidly mounted equipment. Use exothermic-welded connectors for outdoor locations, unless a disconnect-type connection is required; then, use a bolted clamp. Bond straps directly to the basic structure taking care not to penetrate any adjacent parts. Install straps only in locations accessible for maintenance.

D. CONNECTIONS
   1. General: Make connections so galvanic action or electrolysis possibility is minimized. Select connectors, connection hardware, conductors, and connection methods so metals in direct contact will be galvanically compatible.
      a) Use electroplated or hot-tin-coated materials to ensure high conductivity and to make contact points closer to order of galvanic series.
      b) Make connections with clean, bare metal at points of contact.
      c) Make aluminum-to-steel connections with stainless-steel separators and mechanical clamps.
      d) Make aluminum-to-galvanized steel connections with tin-plated copper jumpers and mechanical clamps.
      e) Coat and seal connections having dissimilar metals with inert material to prevent future penetration of moisture to contact surfaces.
   2. Compression Connections: Comply with manufacturers written instructions.
   3. Equipment Grounding Conductor Terminations: For No. 8 AWG and larger, use pressure-type grounding lugs. No. 10 AWG and smaller grounding conductors may be terminated with winged pressure-type connectors.
   4. Non-contact Metal Raceway Terminations: If metallic raceways terminate at metal housings without mechanical and electrical connection to housing, terminate each conduit with a grounding bushing. Connect grounding bushings with a bare grounding conductor to grounding bus or terminal in housing. Bond electrically non-continuous conduits at entrances and exits with grounding bushings and bare grounding conductors, unless otherwise indicated.
   5. Tighten screws and bolts for grounding and bonding connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.
   6. Compression-Type Connections: Use hydraulic compression tools to provide correct circumferential pressure for compression connectors. Use tools and dies recommended by connector manufacturer. Provide embossing die code or other standard method to make a visible indication that a connector has been adequately compressed on grounding conductor.
   7. Moisture Protection: If insulated grounding conductors are connected to ground rods or grounding buses, insulate entire area of connection and seal against moisture penetration of insulation and cable.

662– 3.04 CONDUCTORS AND CABLES.

A. CONDUCTOR AND INSULATION APPLICATIONS
   1. Exposed Feeders outdoors: Type XHHW or USE single conductors in raceway.
   2. Feeders Concealed in Concrete, below Slabs-on-Grade, or underground: Type XHHW or USE single conductors in raceway. Provide cable in raceway where shown.
   3. Exposed Branch Circuits outdoors: Type XHHW or USE single conductors in raceway.
   4. Exposed Feeder and Branch Circuits indoors: Type THWN in raceway.
   5. Branch Circuits Concealed in Concrete, below Slabs-on-Grade, or underground: Type XHHW or USE single conductors in raceway. Provide cable in raceway where shown.

6. Coordinate conductor insulation temperature rating and ampacity rating with the temperature and ampacity rating of their circuit protection devices.
7. Concealed Feeders and Branch circuits indoors: Type THWN in raceway.
8. Concealed Feeders and Branch circuits outdoors in locations not discussed above: Type XHHW in raceway.
9. Fire Alarm wiring: Cable in raceway.
10. Data wiring: Cable in raceway.
11. Telephone wiring: Cable in raceway.
12. PA System wiring: Cable in raceway.
13. All other wiring: Appropriate cable or conductor in raceway except grounding electrode conductors may be routed outside of raceway where not exposed to physical damage.

B. INSTALLATION
1. Install single conductors in raceways, unless otherwise indicated. The raceway sizes shown in the drawings are for copper conductors with THW type insulation. Maintain raceway sizes as shown or larger for conductors with other types of insulation, unless approved otherwise.
2. Utilize minimum wire sizes as follows, unless noted otherwise:
    a) No. 12 AWG for branch circuit wiring.
    b) No. 16 AWG for control circuit wiring.
    c) No. 16 AWG for luminaire wiring.
3. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.
4. Use pulling means, including fish tape, cable, rope, and basket weave wire/cable grips that will not damage cables or raceway.
5. Install cables parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.
6. Maintain cable-bending radii in excess of those allowed by the manufacturer.
7. Support cables according to 662-3.02 Basic Electrical Methods.
8. Neatly bundle and form conductors to fan into terminals at regular intervals inside panels, control panels, and terminal cabinets.
9. Identify and color-code conductors and cables.

C. CONNECTIONS
1. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.
2. Make splices and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than un-spliced conductors.
    a) Use oxide inhibitor in each splice and tap conductor for aluminum conductors, and for all conductors located in moist or corrosive environments.
3. Wiring at Outlets: Install conductor at each outlet, with at least 6 inches of slack.

662– 3.05 RACEWAYS AND BOXES.

A. RACEWAY APPLICATION
1. Outdoors:
    a) Exposed: RSC.
    b) Concealed: RSC.
    c) Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, and between enclosures and equipment that move relative to each other due to tide and wave action): LFNC, LFMC

where greater than 2 inch trade size. LFNC shall use fittings with built in stainless steel cable grips to prevent conduit from pulling out of fittings when it moves.

d) Boxes and Enclosures: NEMA 250, Type 4X, 316 stainless steel.

e) The entire project shall be considered an outdoor space except for the interior of the terminal, storage and generator buildings.

2. Outdoors, Underground:
   a) Single Run, RNC except RSC within 5 feet of structures.
   b) Grouped, RNC except RSC within 5 feet of structures.
   c) Provide RSC elbows, only.
3. Indoors:
   a) Exposed: EMT.
   b) Concealed: EMT.
   c) Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): FMC; except use LFNC, LFMC where greater than 2-inch trade size, in damp or wet locations.
   d) Boxes and Enclosures: NEMA 250, Type 1.
4. Minimum Raceway Size: 1/2-inch trade size.
5. Raceway Fittings: Compatible with raceways and suitable for use and location.
   a) Rigid Steel Conduit: Use threaded rigid steel conduit fittings, unless otherwise indicated.

B. INSTALLATION
1. Keep raceways at least 6 inches away from parallel runs of flues and steam or hot-water pipes.
2. Complete raceway installation before starting conductor installation.
3. Support raceways as specified in Basic Methods paragraphs of this section. All exposed conduit shall be secured within 12 inches of all terminations as well as per the National Electrical Code.
4. Install temporary closures to prevent foreign matter from entering raceways.
5. Make bends and offsets so inside diameter is not reduced. Keep legs of bends in the same plane and keep straight legs of offsets parallel, unless otherwise indicated.
6. Install exposed raceways, and raceways within accessible spaces, parallel or at right angles to nearby surfaces or structural members and follow surface contours as much as possible.
   a) Run parallel or banked raceways together on common supports.
   b) Make parallel bends in parallel or banked runs. Use factory elbows only where elbows can be installed parallel; otherwise, provide field bends for parallel raceways.
7. Join raceways with fittings designed and approved for that purpose and make joints tight.
   a) Use insulating bushings to protect conductors.
8. Tighten setscrews of threadless fittings with suitable tools.
9. Terminations:
   a) Where raceways are terminated with locknuts and bushings, align raceways to enter squarely and install locknuts with dished part against box. Use two locknuts, one inside and one outside box.
   b) Where raceways are terminated with threaded hubs, screw raceways or fittings tightly into hub so end bears against wire protection shoulder. Where chase nipples are used, align raceways so coupling is square to box; tighten chase nipple so no threads are exposed.
10. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb tensile strength. Leave at least 12 inches of slack at each end of pull wire.
11. Flexible Connections: Use maximum of 72 inches of flexible conduit for equipment subject to vibration, noise transmission, or movement; and for all motors. Install separate ground conductor across flexible connections.

12. Install hinged-cover enclosures and cabinets plumb. Support at each corner.

662– 3.06 WIRING DEVICES.

A. INSTALLATION
   1. Install devices and assemblies level and plumb.
   2. Remove wall plates and protect devices and assemblies during painting.
B. CONNECTIONS
   1. Ground equipment according to Grounding and Bonding paragraphs of this section.
   2. Connect wiring according to Conductors and Cables paragraphs of this section.
   3. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

662– 3.07 LIGHTING CONTROL DEVICES.

A. INSTALLATION
   1. Install equipment level and plumb and according to manufacturer's written instructions.
   2. Mount lighting control devices according to manufacturer's written instructions and requirements in Basic Electrical Methods paragraphs.
B. CONTROL WIRING INSTALLATION
   1. Install wiring between sensing and control devices according to manufacturer's written instructions and as specified in Conductors and Cables.
   2. Wiring Method: Install all wiring in raceway as specified in Raceways and Boxes paragraphs.
   3. Bundle, train, and support wiring in enclosures.
   4. Ground equipment.
   5. Connections: Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A.

662– 3.08 PACKAGED ENGINE GENERATOR.

3.1 EXAMINATION

A. Examine areas, equipment foundations, and conditions, with Installer present, for compliance with requirements for installation and other conditions affecting packaged engine generator performance.
   1. Proceed with installation only after unsatisfactory conditions have been corrected.
B. Examine roughing-in of cooling-system piping systems and electrical connections. Verify actual locations of connections before packaged engine generator installation.

3.2 CONCRETE BASES

A. Install concrete bases of dimensions indicated on the plans. Increase as required to meet manufacturer recommendations for packaged engine generators.

3.3 INSTALLATION

A. Comply with packaged engine generator manufacturers' written installation and alignment instructions, and with codes for optional standby power systems.
B. Set packaged engine generator set on concrete bases.

1. Install generator-set on isolation mounting spring sets. Provide six minimum spring sets, three on each side. Size each spring set to carry the percentage of the dead load and live load as recommended by the Genset and spring manufacturers.

C. Install packaged engine generator to provide access for periodic maintenance, including removal of drivers and accessories.

D. Electrical Wiring: Install electrical devices furnished by equipment manufacturers but not specified to be factory mounted.
   1. Verify that electrical wiring is installed according to manufacturers' submittal and installation requirements in Division 16 Sections. Proceed with equipment startup only after wiring installation is satisfactory.

E. Program the generator as described herein and on the drawings.

3.4 CONNECTIONS

A. Piping installation requirements are as required by the Genset and equipment manufacturers and common trade practices. Drawings indicate general arrangement of piping and specialties. The following are specific connection requirements:
   1. Install piping adjacent to packaged engine generator to allow service and maintenance.

B Electrical wiring and connections are specified in Division 16 Section.

C. Ground equipment.
   1. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

3.5 IDENTIFICATION

A. Identify system components according to Division 16 Section 16050 "Basic Electrical Materials and Methods."

3.6 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including piping and electrical connections, and to assist in testing. Report results in writing.

B. Testing: Perform field quality-control testing under the supervision of the manufacturer's factory-authorized service representative.

C. Tests: Include the following:
   1. Tests recommended by manufacturer.
   2. Perform tests required by code for optional standby generators that are additional to those specified here including, but not limited to, the following:
      a. Single-step full-load pickup test.
      b. Simulated utility outage via opening service disconnect.
   3. Battery Tests: Measure charging voltage and voltages between available battery terminals for full-charging and float-charging conditions. Check electrolyte level and specific gravity under both conditions. Test for contact integrity of all connectors. Perform an integrity load test and a capacity load test for the battery. Verify acceptance of charge for each element of battery after discharge. Verify measurements are within manufacturer's Specifications.
   4. Battery-Charger Tests: Verify specified rates of charge for both equalizing and float-charging conditions.
   5. System Integrity Tests: Methodically verify proper installation, connection, and integrity of each element of engine generator system before and during system operation. Check for air, exhaust, and fluid leaks.
   7. Voltage and Frequency Transient Stability Tests: Use recording oscilloscope to measure voltage and frequency transients for 50 and 100 percent step-load increases and decreases, and verify that performance is as specified.

8. Harmonic-Content Tests: Measure harmonic content of output voltage under 25 percent and at 100 percent of rated linear load. Verify that harmonic content is within specified limits.

F. Coordinate tests with tests for transfer switches and run them concurrently.
G. Retest: Correct deficiencies identified by tests and observations and retest until specified requirements are met.
H. Report results of tests and inspections in writing. Record adjustable relay settings and measured insulation resistances, time delays, and other values and observations. Attach a label or tag to each tested component indicating satisfactory completion of tests.
I. Test instruments shall have been calibrated within the last 12 months, traceable to standards of the National Institute for Standards and Technology, and adequate for making positive observation of test results. Make calibration records available for examination on request.

3.7 COMMISSIONING

A. Battery Equalization: Equalize charging of battery cells according to manufacturer's written instructions. Record individual cell voltages.
B. Replace all blown fuses and any none functioning devices prior to completion of the project.

3.8 CLEANING

A. On completion of installation, inspect system components. Remove paint splatters and other spots, dirt, and debris. Repair damaged finish to match original finish. Clean components internally using methods and materials recommended by manufacturer.

3.9 DEMONSTRATION

A. Engage a factory-authorized service representative to train OWNER’s maintenance personnel to adjust, operate, and maintain packaged engine generators as specified below:
1. Coordinate this training with that for transfer switches.
2. Train OWNER’s maintenance personnel on procedures and schedules for starting and stopping, using all features and functions of the equipment, and troubleshooting, servicing, and maintaining equipment.
3. Review data in maintenance manuals.
4. Schedule training with OWNER, through ENGINEER, with at least seven days advance notice.
5. Minimum Instruction Period: Eight hours.

662– 3.09 INDIVIDUALLY MOUNTED ENCLOSED SWITCHES AND CIRCUIT BREAKERS.

A. EXAMINATION
1. Examine elements and surfaces to receive enclosed switches for compliance with installation tolerances and other conditions affecting performance.
a) Proceed with installation only after unsatisfactory conditions have been corrected.
B. IDENTIFICATION
1. Enclosure Nameplates: Label each enclosure with engraved metal or laminated-plastic nameplate mounted with corrosion-resistant screws.
C. CONNECTIONS
1. Install equipment-grounding connections for switches with ground continuity to main electrical ground bus.
2. Install power wiring. Install wiring between switches, and control and indication devices.

3. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

662– 3.10 PANELBOARDS.

A. INSTALLATION
   1. Install panelboards and accessories according to NEMA PB 1.1.
   2. Mounting Heights: Top of trim 74 inches above finished floor, unless otherwise indicated.
   3. Mounting: Plumb and rigid without distortion of box.
   4. Circuit Directory: Create a directory to indicate installed circuit loads after balancing panelboard loads. Obtain approval before installing. Use a computer or typewriter to create directory; handwritten directories are not acceptable.
   5. Install filler plates in unused spaces.
   6. Wiring in Panelboard Gutters: Arrange conductors into groups and bundle and wrap with wire ties.

B. IDENTIFICATION
   1. Panelboard Nameplates: Label each panelboard with engraved metal or laminated-plastic nameplate mounted with corrosion-resistant screws.

C. CONNECTIONS
   1. Install equipment grounding connections for panelboards with ground continuity to main electrical ground bus.
   2. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

662– 3.11 DRY-TYPE TRANSFORMERS 600 V AND LESS.

A. EXAMINATION
   1. Examine conditions for compliance with enclosure- and ambient-temperature requirements for each transformer.
   2. Verify that field measurements are as needed to maintain working clearances required by NFPA 70 and manufacturer's written instructions.
   3. Proceed with installation only after unsatisfactory conditions have been corrected.

B. INSTALLATION
   1. Install wall-mounting transformers level and plumb with wall brackets fabricated by transformer manufacturer.

C. CONNECTIONS
   1. Ground equipment according to Grounding and Bonding.
   2. Connect wiring according to Conductors and Cables.
   3. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

D. ADJUSTING
   1. Record transformer secondary voltage at each unit for at least 48 hours of typical occupancy period. Adjust transformer taps to provide optimum voltage conditions at secondary terminals. Optimum is defined as not exceeding nameplate voltage plus 10 percent and not being lower than nameplate voltage minus 5 percent. Submit recording and tap settings as test results.
   2. Output Settings Report: Prepare written report recording output voltages and tap settings.

662– 3.12 LIGHTING FIXTURES.

A. INSTALLATION
    1. Install LED fixtures as shown on the drawings.
    2. Luminaire Attachment: Fasten to indicated structural supports.
    3. Interior Fixtures: Set level, plumb, and square with ceilings and walls.
B. CONNECTIONS
    1. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

662– 3.13 LIGHTING POLES.

A. ERECTION, GENERAL
    1. Set reinforcement for anchor bolts, nuts, and washers according to anchor-bolt templates furnished by pole manufacturer.
    2. Install poles as follows:
        a) Use web fabric slings (not chain or cable) to raise and set poles.
        b) Mount pole to foundation with leveling nuts, and tighten top nuts to torque level recommended by pole manufacturer.
        c) Secure poles level, plumb, and square.
B. GROUNDING
    1. Ground metal poles/support structures.
        a) Install grounding conductor pigtail in the base for connecting luminaire to grounding system.
    2. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

662– 3.14 PA SYSTEM.

A. None

662– 3.15 VIDEO CAMERA SYSTEM.

A. None

662– 3.16 FIELD QUALITY CONTROL.

A. General: Inspect installed components for damage and faulty work, including the following:
    1. Supporting devices for electrical components.
    2. Electrical identification.
    3. Concrete bases.
    4. Touchup painting.
B. Ground Testing: Perform the following field quality control testing.
    1. After installing grounding system but before permanent electrical circuitry has been energized, test for compliance with requirements.
    2. Test completed grounding system at each location where a maximum ground-resistance level is specified, and at service disconnect enclosure grounding terminal. Measure ground resistance not less than two full days after the last trace of precipitation, and without the soil being moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance. Perform tests, by the fall-of-potential method according to IEEE 81. Describe measures taken to improve test results.
        a) Equipment Rated 500 kVA and Less: 10 ohms.

3. Excessive Ground Resistance: If resistance to ground exceeds specified values, notify Engineer promptly and include recommendations to reduce ground resistance.

C. Conductor and Cable Testing: Perform the following field quality-control testing:
   1. After installing conductors and cables and before electrical circuitry has been energized, test for compliance with requirements.
   2. Perform each electrical test and visual and mechanical inspection stated in NETA ATS, Section 7.3.1. Certify compliance with test parameters.

D. Wiring Device Testing: Perform the following field tests and inspections and prepare test reports:
   1. After installing wiring devices and after electrical circuitry has been energized, test for proper polarity, ground continuity, and compliance with requirements.
   2. Test GFCI operation with both local and remote fault simulations according to manufacturer's written instructions.
   3. Remove malfunctioning units, replace with new units, and retest as specified above.

E. Lighting Control Testing: Schedule visual and mechanical inspections and electrical tests with at least seven days' advance notice.
   1. Inspect control components for defects and physical damage, testing laboratory labeling, and nameplate compliance with the Contract Documents.
   2. Electrical Tests: Use particular caution when testing devices containing solid-state components. Perform the following according to manufacturer's written instructions:
      a) Continuity tests of circuits.
      b) Operational Tests: Set and operate devices to demonstrate their functions and capabilities in a methodical sequence that cues and reproduces actual operating functions.
         (1) Include testing of devices under conditions that simulate actual operational conditions. Record control settings, operations, cues, and functional observations.
   3. Correct deficiencies, make necessary adjustments, and retest. Verify that specified requirements are met.

F. Enclosed Switches And Circuit Breakers Testing: Prepare for acceptance tests as follows:
   1. Test insulation resistance for each enclosed switch, component, and control circuit.
   2. Test continuity of each line- and load-side circuit.
   3. Testing: After installing enclosed switches and after electrical circuitry has been energized, demonstrate product capability and compliance with requirements.
      a) Procedures: Perform each visual and mechanical inspection indicated in NETA ATS, Section 7.5. Certify compliance with test parameters.
      b) Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.

G. Panelboard Testing: Prepare for tests as follows: Test insulation resistance for each panelboard bus, component, connecting supply, feeder, and control circuit and test continuity of each circuit.
   1. Testing: After installing panelboards and after electrical circuitry has been energized, demonstrate product capability and compliance with requirements.
      a) Procedures: Perform each visual and mechanical inspection indicated in NETA ATS, Section 7.6 for molded-case circuit breakers. Certify compliance with test parameters.
      b) Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.
   2. Infrared Scanning: After Substantial Completion, but not more than 60 days after Final Acceptance, perform an infrared scan of each panelboard. Remove panel fronts so joints and connections are accessible to portable scanner.
      a) Instrument: Use an infrared scanning device designed to measure temperature or to detect significant deviations from normal values. Provide calibration record for device.
      b) Record of Infrared Scanning: Prepare a certified report that identifies panelboards checked and describes scanning results. Include notation of

deficiencies detected, remedial action taken, and observations after remedial action.

H. Lighting Testing: Verify normal operation of lighting units after installing luminaires and energizing circuits with normal power source.
    1. Inspect each installed fixture for damage. Replace damaged fixtures and components.
    2. Prepare a written report of tests, inspections, observations, and verifications indicating and interpreting results. If adjustments are made to lighting system, retest to demonstrate compliance with standards.

662– 3.16 IDENTIFICATION.

A. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs as specified in Basic Electrical Methods paragraphs.

662– 3.17 REFINISHING AND TOUCHUP PAINTING.

A. Refinish and touch up paint.
B. Clean damaged and disturbed areas and apply primer, intermediate, and finish coats to suit the degree of damage at each location.
C. Follow paint manufacturer's written instructions for surface preparation and for timing and application of successive coats.
D. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
E. Repair damage to PVC or paint finishes with matching touchup coating recommended by manufacturer.

662– 3.18 CLEANING AND PROTECTION.

A. On completion of installation, including outlets, fittings, raceways, boxes, and devices, inspect exposed finish. Repair damaged finishes. Remove burrs, dirt, paint spots, and construction debris.
B. Protect equipment and installations and maintain conditions to ensure that coatings, finishes, and cabinets are without damage or deterioration at time of Substantial Completion.

662-3.19 – MAINTENANCE SERVICE.

A. Maintenance: At Substantial Completion, begin 12 months' full maintenance on genset and automatic transfer switch by skilled employees of the manufacturer's designated service organization. Include quarterly exercising to check for proper, starting, load transfer, and running under load. Include routine preventive maintenance as recommended by manufacturer and adjusting as required for proper operation. Maintenance agreements shall include parts and supplies as used in the manufacture and installation of original equipment, as well as generator parts and accessories, filters, recommended fluids, necessary labor, and travel expenses.

662-3.20 – TRANSFER SWITCHES

3.1 APPLICATION

A. Three-Pole Switches: Provide a three-pole switch.

3.2 INSTALLATION

A. Wall-Mounted Switch: Surface mount on wall.
B. Identify components according to above sections.

3.3 CONNECTIONS

A. Ground equipment as indicated and as required by NFPA 70.

3.4 FIELD QUALITY CONTROL

A. Testing: Test transfer-switch products by operating them in all modes. Perform tests recommended by manufacturer under the supervision of manufacturer's factory-authorized service representative. Correct deficiencies and report results in writing. Record adjustable relay settings.
B. Coordinate tests with tests of generator plant and run them concurrently.
C. Report results of tests and inspections in writing. Record adjustable relay settings and measured insulation and contact resistances and time delays. Attach a label or tag to each tested component indicating satisfactory completion of tests.

3.5 CLEANING

A. After completing equipment installation, inspect unit components. Remove paint splatters and other spots, dirt, and debris. Repair damaged finish to match original finish.
B. Clean equipment internally, on completion of installation, according to manufacturer's written instructions.

3.6 DEMONSTRATION

A. Engage a factory-authorized service representative to train OWNER's personnel to adjust, operate, and maintain transfer switches and related equipment as specified below:
    1. Coordinate this training with that for generator equipment.
    2. Train OWNER's maintenance personnel on procedures and schedules for starting and stopping, troubleshooting, servicing, and maintaining equipment.
    3. Review data in maintenance manuals.
    4. Schedule training with OWNER, through ENGINEER, with at least seven days' advance notice.
    5. Provide a minimum of four hours of instruction.

662-3.21-SAND POINT NETWORK UPGRADES.

None.

662– 4.01 METHOD OF MEASUREMENT.

A. Section 662 lump sum pay items will not be measured for payment.

662– 4.02 BASIS OF PAYMENT.

The lump sum price paid for **Item 662(1), Electrical System (Uplands)** shall be considered full compensation for providing all labor, materials, equipment and incidentals necessary to furnish and install all of the electrical power, lighting, signal, and control systems in conformance with the plans and specifications complete-in-place and accepted. Included is all work shown on the ‘Planset E-series’ sheets for both power, lighting, and control systems including all conduits, junction boxes, and conductors

on the uplands to the abutment. This includes all earthwork, trenching and all other work not specifically designated to be performed by others.

The lump sum price paid for Item **662(2), Electrical System (Marine)** shall be considered full compensation for providing all labor, materials, equipment and incidentals necessary to furnish and install all of the electrical power and lighting systems in conformance with the plans and specifications complete-in-place and accepted. Included is all work shown on the 'Planset E-series' sheets for power, lighting, and control systems including feeder conduits and conductors from the abutment seaward. This includes all work on all marine structures.

Payment will be made under:

Pay Item	Unit
662 (1) Electrical System (Uplands)	Lump Sum
662 (2) Electrical System (Marine)	Lump Sum

State of Alaska

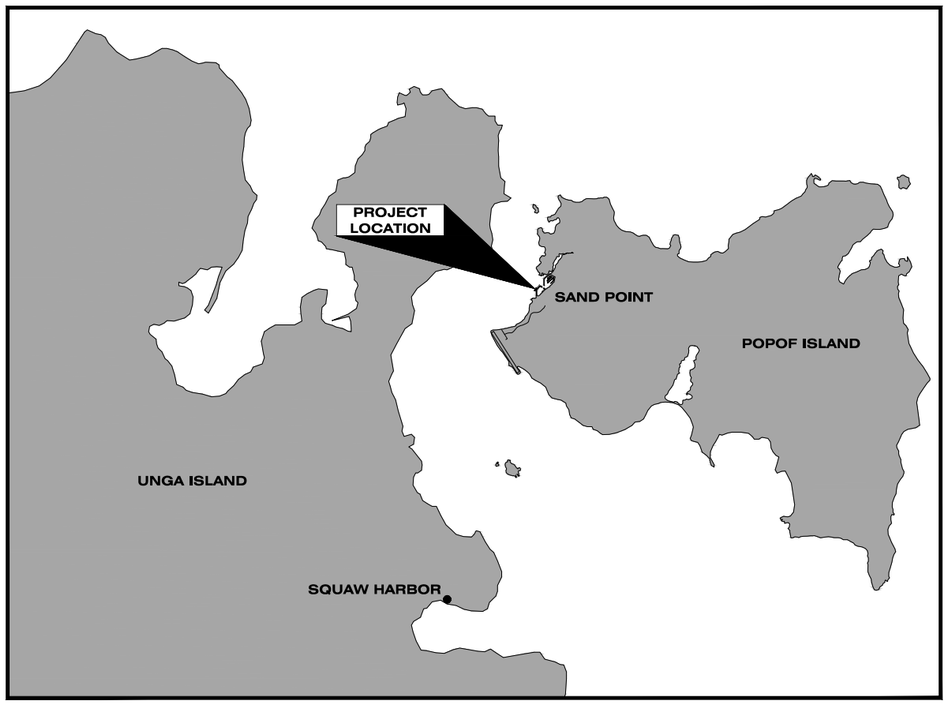
Department of Transportation and Public Facilities Southcoast Region

SAND POINT DOCK REPLACEMENT

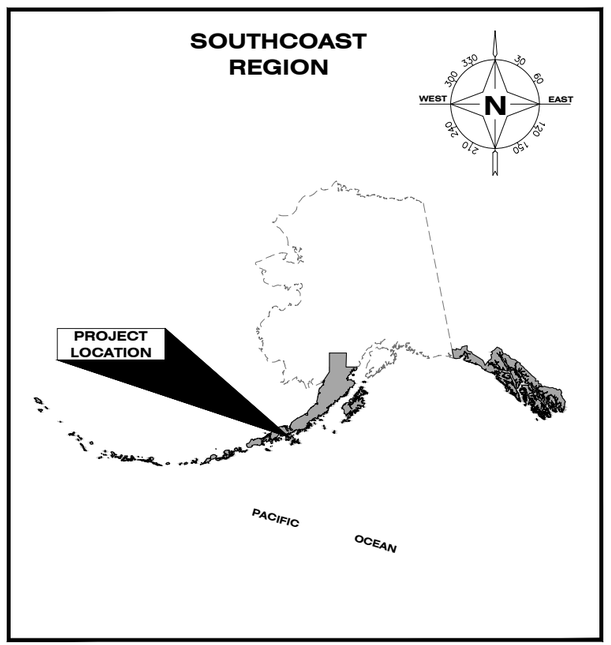
PROJECT No. SFHWY00006

TIDAL DATA	
MHHW	+7.23'
MHW	+6.52'
MLW	1.33'
MLLW	0.00'

65% SUBMITTAL
8/09/2016



SITE MAP



REGIONAL MAP

SHEET INDEX

SHEET NO.	DESCRIPTION
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02	GENERAL NOTES & SPECIFICATIONS
03	ESTIMATE OF QUANTITIES
04	SURVEY AND PROJECT CONTROL
05	EXISTING CONDITIONS & DEMOLITION
06	SITE PLAN
07	GRADING PLAN
08	DOCK LAYOUT
09	DOCK ELEVATION
10	REVETMENT SECTION
11	PILE & CAP LAYOUT
12	PANEL PLAN
13	PILE BENT DETAILS (1 OF 4)
14	PILE BENT DETAILS (2 OF 4)
15	PILE BENT DETAILS (3 OF 4)
16	PILE BENT DETAILS (4 OF 4)
17	DOCK DETAILS (1 OF 2)
18	DOCK DETAILS (2 OF 2)
19	SWING GATE DETAILS
20	CATWALK DETAILS
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23	FENDER DETAILS
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SHEET INDEX

SHEET NO.	DESCRIPTION
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26	BOLLARD DETAILS (3 OF 3)
27	BULLRAIL & LADDER DETAILS
28	HAUNCHED PANEL DETAILS
29	E3 GEN BLDG
E01	TITLE, LEGEND AND GENERAL NOTES
E02	SITE PLAN
E03	SLD
E04	GEN BLDG
E05	GENERATOR BUILDING ELEVATIONS
E06	EQUIPMENT LIST
E07	GENERATOR DETAILS
E08	GENERATOR SCHEMATICS
E09	LIGHT POLE DETAIL
E10	TRENCH DETAIL

PATH: J:\2016\161019 SAND POINT DOCK REPLACEMENT\G. DRAWINGS\CIVIL\01 COVER SHEET.DWG TAB:01
Friday, March 11, 2016 9:35:59 AM
PLOT: PSPACE OR MSPACE: 1=1(F)

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION & PUBLIC FACILITIES
SOUTHCOAST REGION

APPROVED:

REGIONAL PRE-CONSTRUCTION ENGINEER — DATE
L. PAT CARROLL, P.E.

APPROVED:

DIRECTOR OF DESIGN & CONSTRUCTION, SE REGION — DATE
CHUCK CORREA, P.E.

CERTIFIED TRUE & CORRECT AS-BUILT OF ACTUAL FIELD CONDITION:

CONSTRUCTION PROJECT MANAGER — DATE

STATE	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
ALASKA	SFHWY00006	2016	1	29

GENERAL NOTES:

ANY DISCREPANCIES FOUND AMONG THE DRAWINGS, SPECIFICATIONS, SITE CONDITIONS, AND THESE NOTES SHALL BE REPORTED TO THE ENGINEER AT ONCE. ANY FURTHER WORK DONE BY THE CONTRACTOR AFTER FINDING SUCH DISCREPANCIES SHALL BE DONE AT HIS OWN RISK.

APPLICABLE CODES –
ALL LOCAL CODES PLUS THE FOLLOWING SPECIFICATIONS, STANDARDS AND CODES ARE PART OF THESE GENERAL NOTES:

1. ALASKA DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES (ADOT&PF) STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION, CURRENT EDITION
2. AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 7TH EDITION (2014)
3. INTERNATIONAL BUILDING CODE, CURRENT EDITION
4. AWS D1.1 STRUCTURAL WELDING CODE, CURRENT EDITION
5. ACI 318, 301, 306
6. AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC) MANUAL OF STEEL CONSTRUCTION, 14TH EDITION
7. ASTM SPECIFICATIONS
8. ASCE 61–14

IN THE EVENT THAT THERE IS A CONFLICT BETWEEN THE ABOVE REFERENCES AND THESE GENERAL NOTES THE FOLLOWING PRIORITY WILL BE FOLLOWED:

1. ALL PROJECT PERMIT REQUIREMENTS.
2. THESE GENERAL NOTES AND PLANS.
3. LOCAL CODES (& ADOT/PF SPECIFICATIONS WHERE REFERENCED).
4. THE SPECIFICATIONS, STANDARDS AND CODES LISTED ABOVE IN ORDER OF PRECEDENCE.

STRUCTURAL DESIGN CRITERIA –
DOCK DESIGN LIFE – 50 YEARS
UNIFORM LIVE LOAD – 400 PSF
DESIGN VEHICLES – AASHTO STRENGTH I
AASHTO HL93
AASHTO HS25
HYSTER CHALLENGER MODEL H700F
AASHTO STRENGTH II
115 TON TRUCK CRANE

SEISMIC –
DESIGN CLASSIFICATION: MODERATE
SITE CLASS: D (ASSUMED)
CONTINGENCY LEVEL EARTHQUAKE (CLE)
PGA = 0.272g (SITE CLASS B)
S_S = 0.616g
S_1 = 0.215g
DESIGN EARTHQUAKE (DE)
PGA = 0.615g (SITE CLASS B)
S_S = 1.377g
S_1 = 0.521g

BOLLARDS – 80,000 LB SAFE WORKING LOAD (SWL) IN ANY HORIZONTAL DIRECTION
DESIGN VESSELS – M/V TUSTUMENA (3,067 LONG TON DISPLACEMENT)
M/V KENNICOTT (7,683 LONG TON DISPLACEMENT)

TIDE LEVELS
ELEVATION DATUM FOR THIS PROJECT IS MEAN LOWER LOW WATER (MLLW = 0.0').

NOAA TIDAL DATUM FOR 1983–2001 TIDAL EPOCH AT SAND POINT, POPOF ISLAND ALASKA (STATION ID# 9459450)

HIGHEST OBSERVED **+11.58 FT**
MEAN HIGHER HIGH WATER (MHHW) **+7.23 FT**
MEAN HIGH WATER (MHW) **+6.52 FT**
MEAN TIDE LEVEL (MTL) **+3.93 FT**
MEAN SEA LEVEL (MSL) **+3.87 FT**
MEAN LOW WATER (MLW) **+1.33 FT**
MEAN LOWER LOW WATER (MLLW) **0.0 FT**
LOWEST OBSERVED **–3.82 FT**

SURVEY–
ALL CONSTRUCTION SURVEYS SHALL BE PERFORMED BY OR UNDER THE DIRECT SUPERVISION OF A SURVEYOR LICENSED IN THE STATE OF ALASKA.

THE CONTRACTOR SHALL VERIFY THE PROVIDED PROJECT HORIZONTAL AND VERTICAL CONTROL. THE ENGINEER SHALL BE NOTIFIED OF ANY DISCREPANCIES IN THE PROVIDED PROJECT CONTROL POINTS. SITE SPECIFIC CONTROL SHALL BE PROVIDED BY THE CONTRACTOR AS NECESSARY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ALL HORIZONTAL AND VERTICAL CONTROL.

THE CONTRACTOR SHALL FURNISH AT ITS OWN EXPENSE ALL STAKES, TEMPLATES, PLATFORMS, EQUIPMENT, RANGE MARKERS, AND LABOR AS MAY BE REQUIRED TO LAY OUT THE WORK FROM THE CONTROL POINTS. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO MAINTAIN THE CONTROL POINTS UNTIL AUTHORIZED TO REMOVE THEM. IF SUCH POINTS ARE DESTROYED OR DISTURBED THEY SHALL BE REESTABLISHED BY THE CONTRACTOR AT THE CONTRACTOR'S EXPENSE.

ABBREVIATIONS

AC – ASPHALT CONCRETE
ADOT – ALASKA DEPARTMENT OF TRANSPORTATION
BOP – BOTTOM OF PIPE
BP – BEGIN PROJECT
CL – CENTERLINE
CONN – CONNECTION
CU – COPPER
DIP – DUCTILE IRON PIPE
E – EASTING
EL – ELEVATION
ELEV – ELEVATION
EOP – END OF PROJECT
EXIST – EXISTING
F&I – FURNISH AND INSTALL
G.V. – GATE VALVE
HSD – HENRY SWANSON DRIVE
HORZ – HORIZONTAL
HTL – HIGH TIDE LEVEL
INV – INVERT
L – LENGTH OF CURVE
LF – LINEAR FEET
MAX – MAXIMUM
MH – MAN HOLE
MHW – MEAN HIGH WATER
MIN – MINIMUM
MLLW – MEAN LOWER LOW WATER
N – NORTHING
NIC – NOT IN CONTRACT
NFS – NON–FROST SUSCEPTIBLE
NTS – NOT TO SCALE
NWT – NO WATER TABLE
PC – POINT OF CURVATURE
PI STA – POINT OF INFLECTION STATION
PT – POINT OF TANGENT
PVI STA – POINT OF VERTICAL INFLECTION STATION
QAR – QUARRY ACCESS ROAD
R – RADIUS OF CURVATURE
ROW – RIGHT OF WAY
R/W – RIGHT OF WAY
SMD – SETTLEMENT MONITORING DEVICE
SSMH – SANITARY SEWER MANHOLE
STA – STATION
T – TANGENT LENGTH
TP – TEST PIT
TYP – TYPICAL
UNO – UNLESS NOTED OTHERWISE
USACE – UNITED STATES ARMY CORPS OF ENGINEERS
V – VALVE
VB – VALVE BOX
VC – VERTICAL CURVE
VERT – VERTICAL

65% SUBMITTAL
8/09/2016

DO NOT SCALE FROM THESE DRAWINGS USE DIMENSIONS

DESIGNED BY: xxx	STATE OF ALASKA DEPARTMENT OF TRANSPORTATION & PUBLIC FACILITIES SOUTHEAST REGION
CHECKED BY: STAFF	**MARINE** **SAND POINT** **DOCK REPLACEMENT** **PROJECT #SFHWY00006**
DRAWN BY: STAFF	**GENERAL NOTES & SPECIFICATIONS**

PATH: 02 GENERAL NOTES & SPECIFICATIONS.DWG
TAB: 02 Tuesday, August 09, 2016 6:29:44 PM ALEJANDRO MENDOZA

REVISIONS			PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
NO.	DATE	DESCRIPTION				
			SFHWY00006	2016	2	29

ESTIMATE OF QUANTITIES

ITEM NO.	PAY ITEM	PAY UNIT	TOTAL
207(X)	SALVAGED CLASS A ARMOR ROCK	LUMP SUM	ALL REQ'D
207(X)	SALVAGED CLASS B ARMOR ROCK	LUMP SUM	ALL REQ'D
207(X)	CLASS A ARMOR ROCK	LUMP SUM	ALL REQ'D
207(X)	CLASS B ARMOR ROCK	LUMP SUM	ALL REQ'D
203(X)	BORROW	CUBIC YARD	XXX
501(X)	CONCRETE DOCK	LUMP SUM	ALL REQ'D
504(X)	FENDER	EACH	XX
504(X)	BOLLARD	EACH	XX
504(X)	BULLRAIL	EACH	XX
504(X)	DOLPHIN	EACH	XX
504(X)	CATWALK	EACH	XX
505(X)	FURNISH STRUCTURAL STEEL PILES (XX)	LINEAR FOOT	XX
505(X)	DRIVE STRUCTURAL STEEL PILES, (XX)	EACH	XX
505(X)	PILE ANODES	EACH	XX
505(X)	PILE SPLICE	CONTINGENT SUM	ALL REQ'D
615(X)	SIGNS	LUMP SUM	ALL REQ'D
640(X)	MOBILIZATION AND DEMOBILIZATION	LUMP SUM	ALL REQ'D
640(X)	WORKER MEALS AND LODGING, OR PER DIEM	LUMP SUM	ALL REQ'D
641(X)	EROSION, SEDIMENT AND POLLUTION CONTROL ADMINISTRATION	LUMP SUM	ALL REQ'D
641(X)	TEMPORARY EROSION, SEDIMENT AND POLLUTION CONTROL	LUMP SUM	ALL REQ'D
641(X)	TEMPORARY EROSION, SEDIMENT AND POLLUTION CONTROL	CONTINGENT SUM	ALL REQ'D
641(X)	WITHHOLDING	CONTINGENT SUM	ALL REQ'D
642(X)	CONSTRUCTION SURVEYING	LUMP SUM	ALL REQ'D
644(X)	FIELD OFFICE	LUMP SUM	ALL REQ'D
644(X)	VEHICLES	LUMP SUM	ALL REQ'D
645(X)	TRAINING PROGRAM	LABOR HOURS	XXX
649(X)	MARINE MAMMAL AND EIDER OBSERVATION	LUMP SUM	ALL REQ'D

BASIS OF ESTIMATES

ITEM NO.	ITEM	ESTIMATING FACTOR
207(X)	SALVAGED CLASS A ARMOR ROCK	XX CY/LUMP SUM
207(X)	SALVAGED CLASS B ARMOR ROCK	XX CY/LUMP SUM
207(X)	CLASS A ARMOR ROCK	XX CY/LUMP SUM
207(X)	CLASS B ARMOR ROCK	XX CY/LUMP SUM

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8/09/2016

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DESIGNED BY: xxx
CHECKED BY: STAFF
DRAWN BY: STAFF

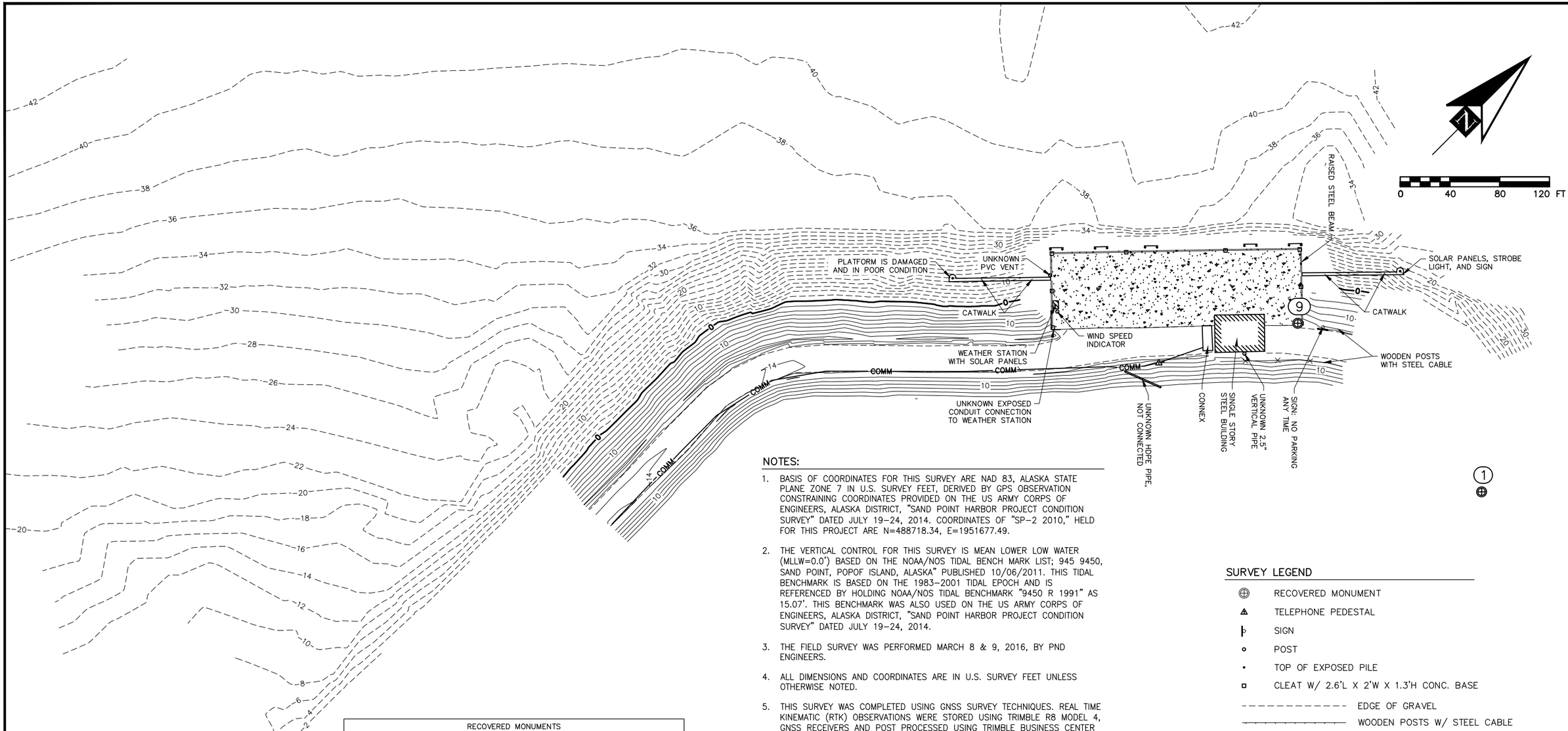
STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION
& PUBLIC FACILITIES
SOUTHEAST REGION

MARINE
SAND POINT
DOCK REPLACEMENT
PROJECT #SFHWY00006

ESTIMATE OF QUANTITIES

PATH: 03 ESTIMATE OF QUANTITIES.DWG
TAB: 03 Tuesday, August 09, 2016 6:29:58 PM ALEJANDRO MENDOZA

REVISIONS NO.	DATE	DESCRIPTION	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			SFHWY00006	2016	3	29



RECOVERED MONUMENTS				
Point #	Northing	Easting	Elevation	Description
1	489768.320	1952169.160	11.69	FD BC[NOAA]: TIDAL BM
8	488718.340	1951677.490	15.29	FD BC[HUGHES & ASSOC]: 2010
9	489759.564	1951968.833	15.07	FD BC[NOAA]: TIDAL BM 9450S 1991

16' 0 16' 32'
GRAPHIC SCALE (FT)

NOTES:

1. BASIS OF COORDINATES FOR THIS SURVEY ARE NAD 83, ALASKA STATE PLANE ZONE 7 IN U.S. SURVEY FEET, DERIVED BY GPS OBSERVATION CONSTRAINING COORDINATES PROVIDED ON THE US ARMY CORPS OF ENGINEERS, ALASKA DISTRICT, "SAND POINT HARBOR PROJECT CONDITION SURVEY" DATED JULY 19–24, 2014. COORDINATES OF "SP–2 2010," HELD FOR THIS PROJECT ARE N=488718.34, E=1951677.49.
2. THE VERTICAL CONTROL FOR THIS SURVEY IS MEAN LOWER LOW WATER (MLLW=0.0') BASED ON THE NOAA/NOS TIDAL BENCH MARK LIST; 945 9450, SAND POINT, POPOF ISLAND, ALASKA" PUBLISHED 10/06/2011. THIS TIDAL BENCHMARK IS BASED ON THE 1983–2001 TIDAL EPOCH AND IS REFERENCED BY HOLDING NOAA/NOS TIDAL BENCHMARK "9450 R 1991" AS 15.07'. THIS BENCHMARK WAS ALSO USED ON THE US ARMY CORPS OF ENGINEERS, ALASKA DISTRICT, "SAND POINT HARBOR PROJECT CONDITION SURVEY" DATED JULY 19–24, 2014.
3. THE FIELD SURVEY WAS PERFORMED MARCH 8 & 9, 2016, BY PND ENGINEERS.
4. ALL DIMENSIONS AND COORDINATES ARE IN U.S. SURVEY FEET UNLESS OTHERWISE NOTED.
5. THIS SURVEY WAS COMPLETED USING GNSS SURVEY TECHNIQUES. REAL TIME KINEMATIC (RTK) OBSERVATIONS WERE STORED USING TRIMBLE R8 MODEL 4, GNSS RECEIVERS AND POST PROCESSED USING TRIMBLE BUSINESS CENTER v3.40 SOFTWARE. BATHYMETRIC DATA WAS OBTAINED USING AN INTERSPACE 448 ECHOSOUNDER.
6. UTILITY LOCATES WERE SURVEYED WHERE MARKED BY LOCATE COMPANIES. THE ONLY UTILITY LOCATES FOUND WERE PROVIDED BY TELALASKA.
7. CONTOURS ARE IN FEET, WITH TWO FOOT INTERVALS.

SURVEY LEGEND

- RECOVERED MONUMENT
- TELEPHONE PEDESTAL
- SIGN
- POST
- TOP OF EXPOSED PILE
- CLEAT W/ 2.6'L X 2'W X 1.3'H CONC. BASE
- EDGE OF GRAVEL
- WOODEN POSTS W/ STEEL CABLE
- COMM — UNDERGROUND COMMUNICATION CABLE
- CONCRETE
- BUILDING

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CHECKED BY: STAFF
DRAWN BY: STAFF

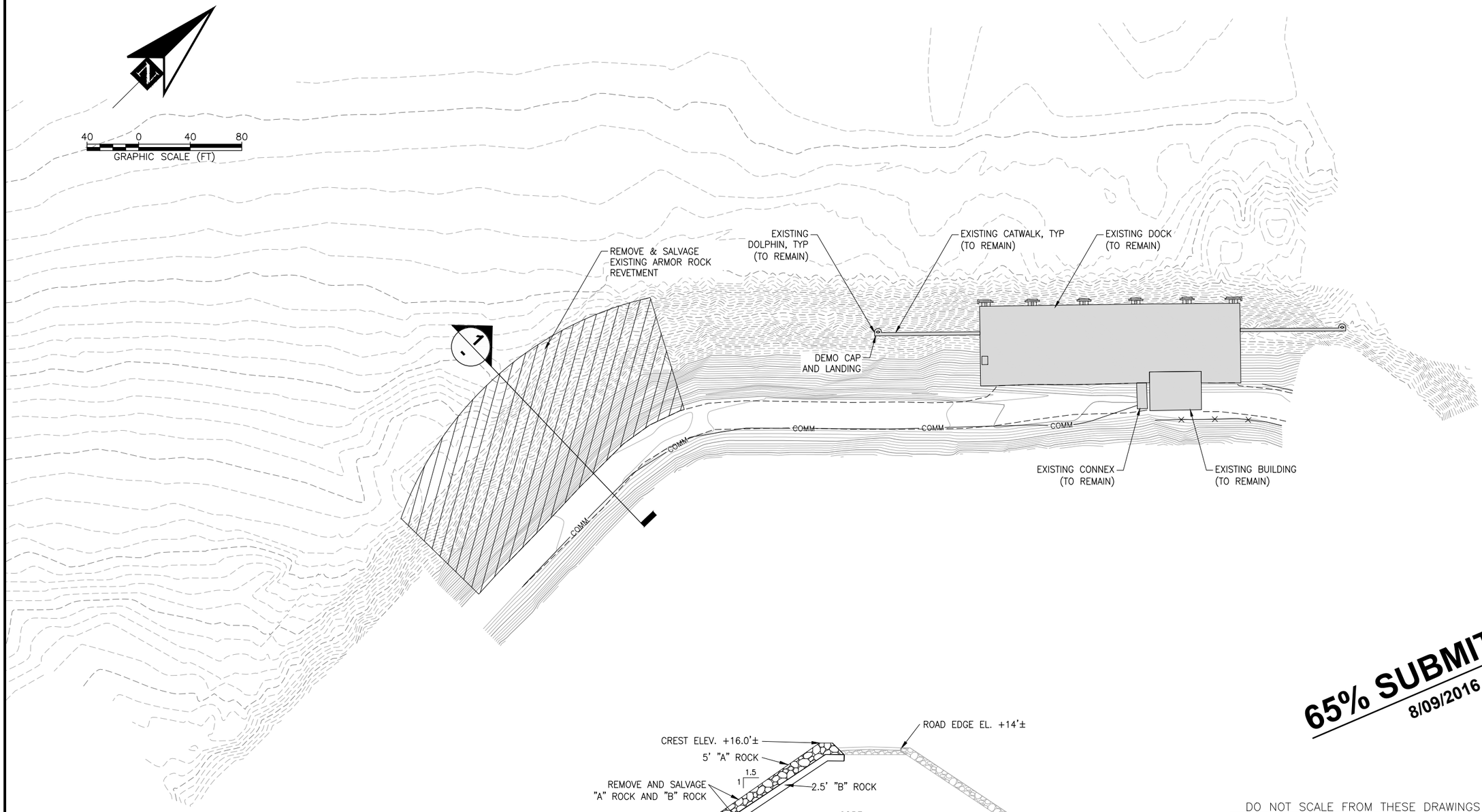
STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION
& PUBLIC FACILITIES
SOUTHEAST REGION

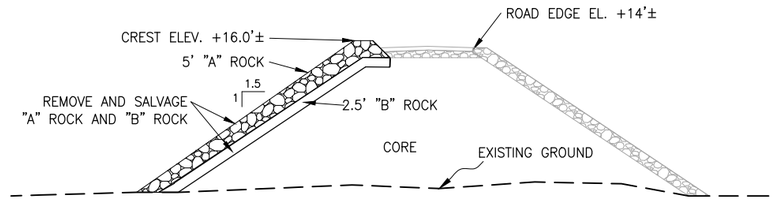
MARINE SAND POINT DOCK REPLACEMENT PROJECT #SFHWY00006

SURVEY AND PROJECT CONTROL

PATH: 04 SURVEY AND PROJECT CONTROL.DWG
TAB: 04 Tuesday, August 09, 2016 6:30:18 PM ALEJANDRO MENDOZA

REVISIONS			PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
NO.	DATE	DESCRIPTION				
			SFHWY00006	2016	4	29





1 - CAUSEWAY SECTION

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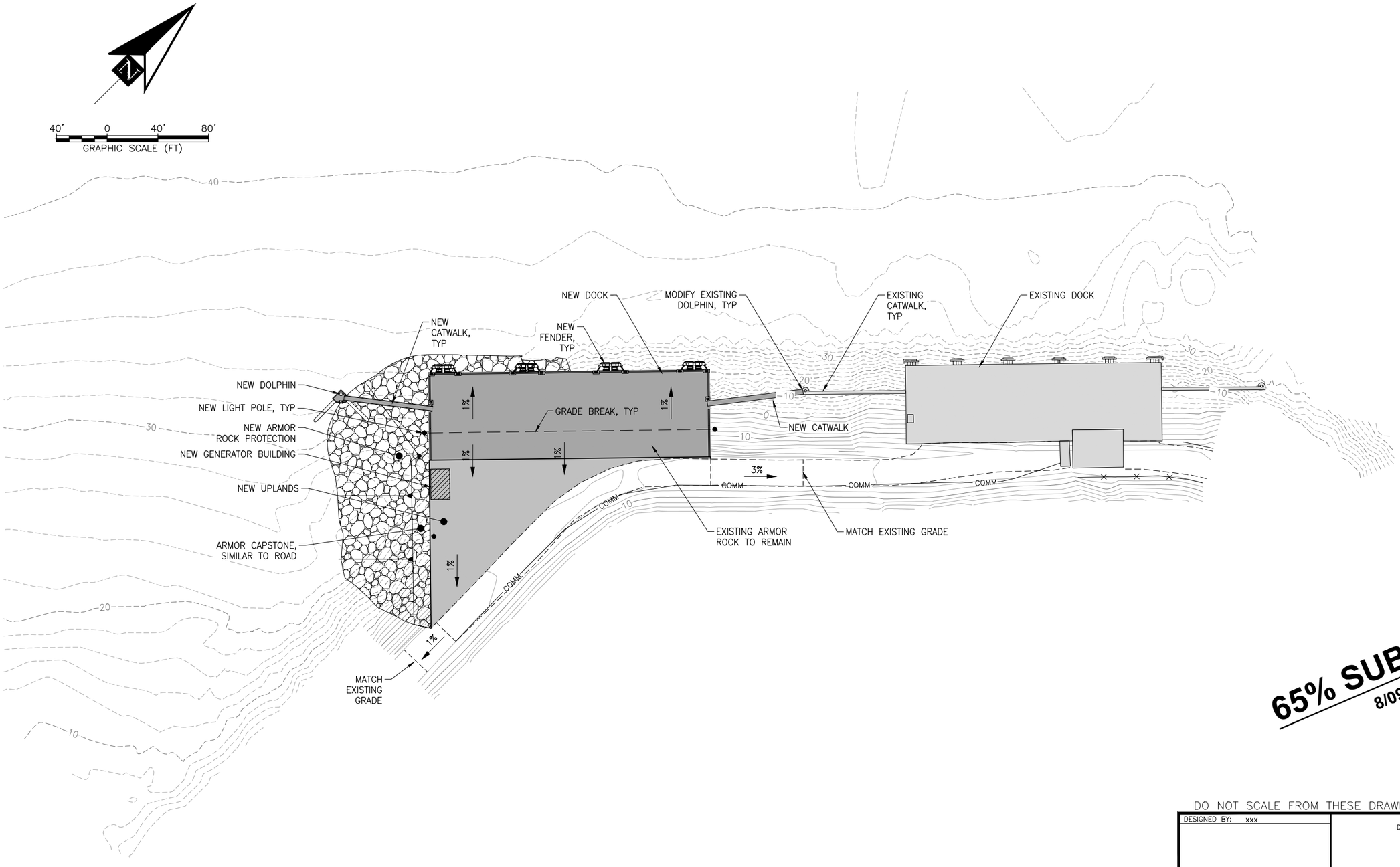
DESIGNED BY: xxx	STATE OF ALASKA DEPARTMENT OF TRANSPORTATION & PUBLIC FACILITIES SOUTHEAST REGION
CHECKED BY: STAFF	**MARINE** **SAND POINT** **DOCK REPLACEMENT** **PROJECT #SFHWY00006**
DRAWN BY: STAFF	**EXISTING CONDITIONS & DEMOLITION**
PATH: 05 EXISTING CONDITIONS AND DEMOLITION.DWG TAB: 05 Tuesday, August 09, 2016 6:30:40 PM	ALEJANDRO MENDOZA

REVISIONS			PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
NO.	DATE	DESCRIPTION				
			SFHWY00006	2016	5	29



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DESIGNED BY: xxx	STATE OF ALASKA DEPARTMENT OF TRANSPORTATION & PUBLIC FACILITIES SOUTHEAST REGION
CHECKED BY: STAFF	**MARINE** **SAND POINT** **DOCK REPLACEMENT** **PROJECT #SFHWY00006**
DRAWN BY: STAFF	**SITE PLAN**

PATH: 06 SITE PLAN.DWG
TAB: 06 Tuesday, August 09, 2016 6:31:01 PM ALEJANDRO MENDOZA

REVISIONS			PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
NO.	DATE	DESCRIPTION				
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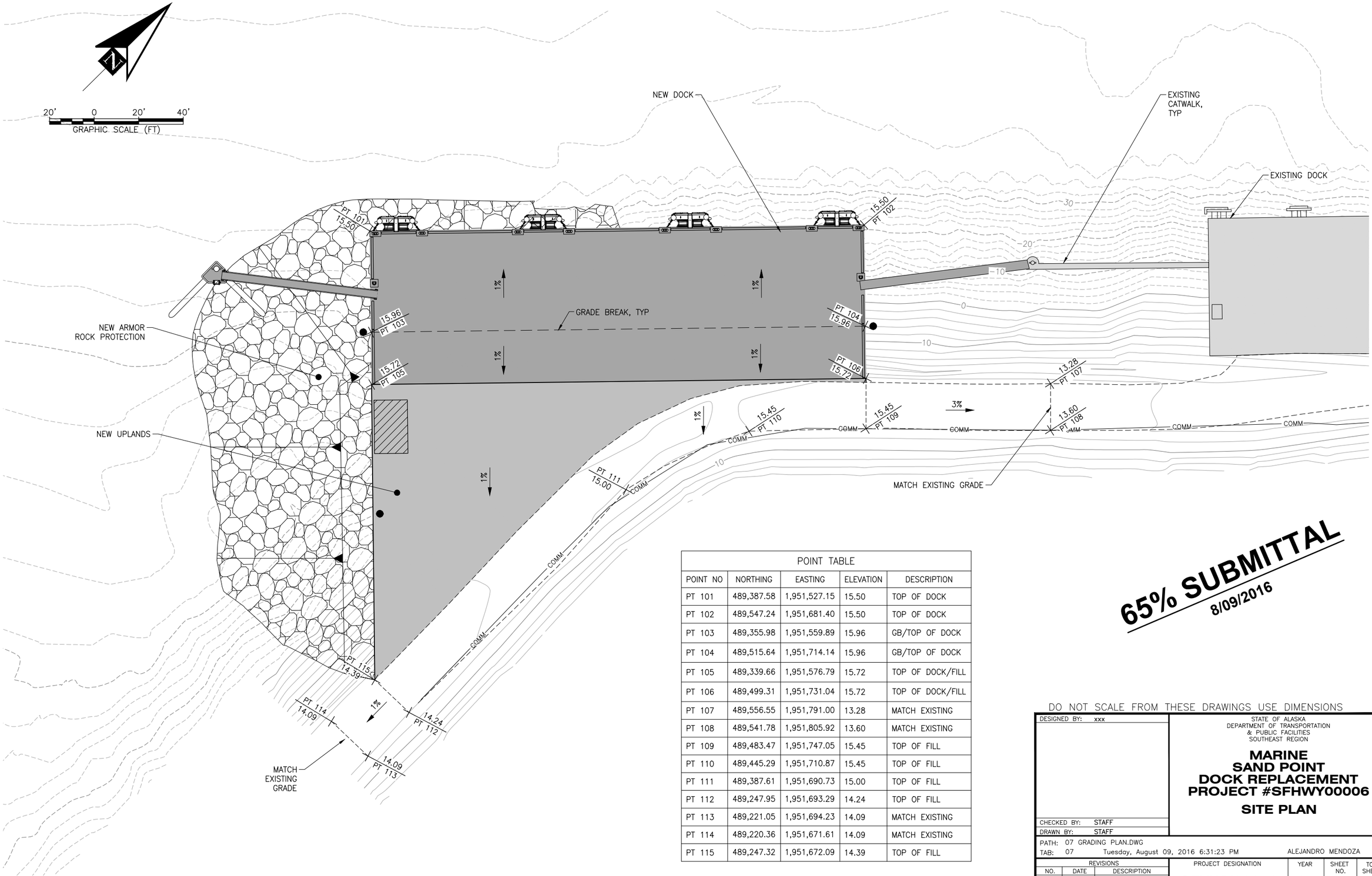

POINT TABLE				
POINT NO	NORTHING	EASTING	ELEVATION	DESCRIPTION
PT 101	489,387.58	1,951,527.15	15.50	TOP OF DOCK
PT 102	489,547.24	1,951,681.40	15.50	TOP OF DOCK
PT 103	489,355.98	1,951,559.89	15.96	GB/TOP OF DOCK
PT 104	489,515.64	1,951,714.14	15.96	GB/TOP OF DOCK
PT 105	489,339.66	1,951,576.79	15.72	TOP OF DOCK/FILL
PT 106	489,499.31	1,951,731.04	15.72	TOP OF DOCK/FILL
PT 107	489,556.55	1,951,791.00	13.28	MATCH EXISTING
PT 108	489,541.78	1,951,805.92	13.60	MATCH EXISTING
PT 109	489,483.47	1,951,747.05	15.45	TOP OF FILL
PT 110	489,445.29	1,951,710.87	15.45	TOP OF FILL
PT 111	489,387.61	1,951,690.73	15.00	TOP OF FILL
PT 112	489,247.95	1,951,693.29	14.24	TOP OF FILL
PT 113	489,221.05	1,951,694.23	14.09	MATCH EXISTING
PT 114	489,220.36	1,951,671.61	14.09	MATCH EXISTING
PT 115	489,247.32	1,951,672.09	14.39	TOP OF FILL

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DESIGNED BY: xxx
CHECKED BY: STAFF
DRAWN BY: STAFF

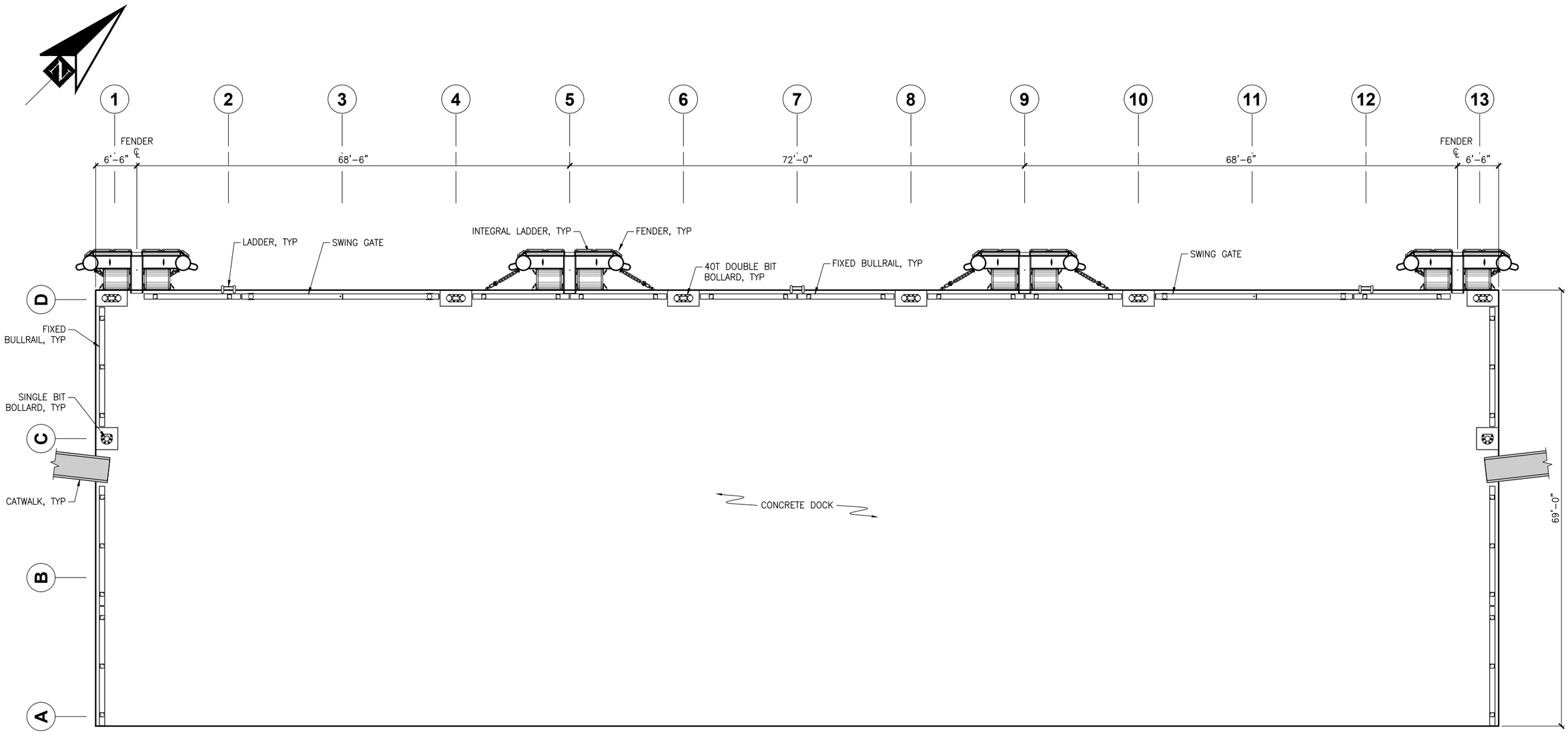
STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION
& PUBLIC FACILITIES
SOUTHEAST REGION

MARINE SAND POINT DOCK REPLACEMENT PROJECT #SFHWY00006

SITE PLAN

PATH: 07 GRADING PLAN.DWG
TAB: 07 Tuesday, August 09, 2016 6:31:23 PM ALEJANDRO MENDOZA

REVISIONS			PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
NO.	DATE	DESCRIPTION				
			SFHWY00006	2016	7	29



DOCK LAYOUT

8 0 8 16
GRAPHIC SCALE (FT)

65% SUBMITTAL
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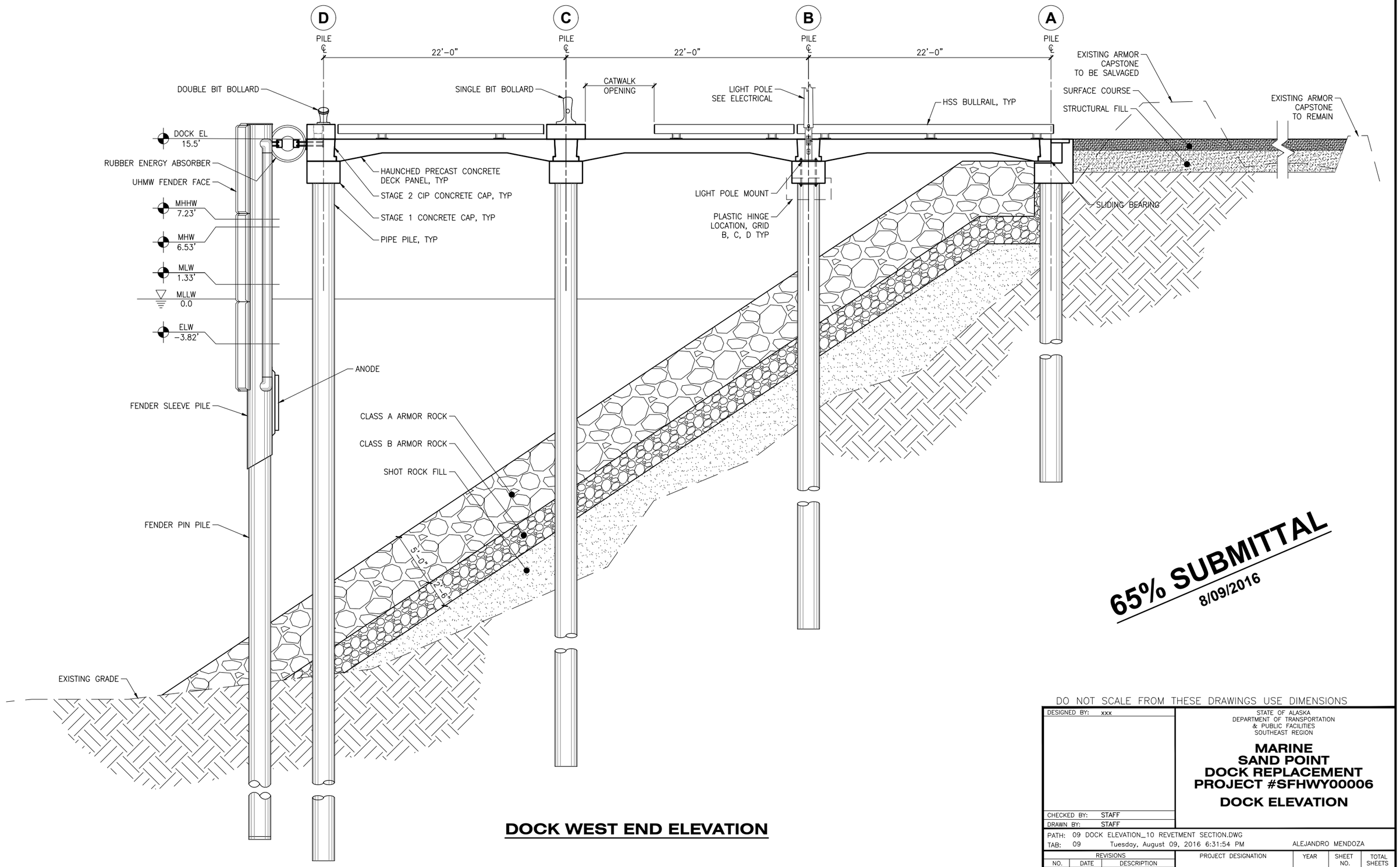
DESIGNED BY: xxx	STATE OF ALASKA DEPARTMENT OF TRANSPORTATION & PUBLIC FACILITIES SOUTHEAST REGION
CHECKED BY: STAFF	**MARINE** **SAND POINT** **DOCK REPLACEMENT** **PROJECT #SFHWY00006**
DRAWN BY: STAFF	**DOCK LAYOUT**

PATH: 08 DOCK LAYOUT.DWG
TAB: 08 Tuesday, August 09, 2016 6:31:38 PM ALEJANDRO MENDOZA

REVISIONS			PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
NO.	DATE	DESCRIPTION				
			SFHWY00006	2016	8	29



DOCK WEST END ELEVATION

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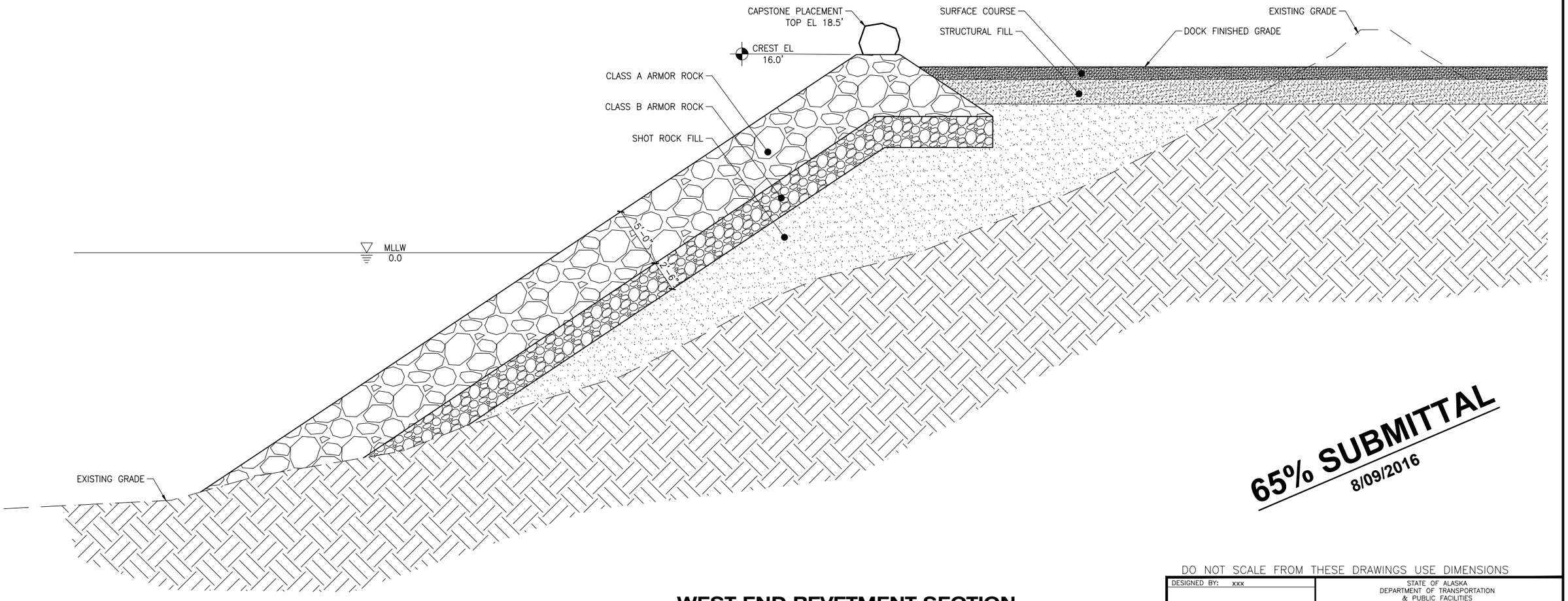
DESIGNED BY: xxx	STATE OF ALASKA DEPARTMENT OF TRANSPORTATION & PUBLIC FACILITIES SOUTHEAST REGION
	MARINE **SAND POINT** **DOCK REPLACEMENT** **PROJECT #SFHWY00006**
	DOCK ELEVATION
CHECKED BY: STAFF	
DRAWN BY: STAFF	
PATH: 09 DOCK ELEVATION_10 REVETMENT SECTION.DWG TAB: 09 Tuesday, August 09, 2016 6:31:54 PM	ALEJANDRO MENDOZA

REVISIONS NO.	DATE	DESCRIPTION	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			SFHWY00006	2016	9	29



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WEST END REVETMENT SECTION

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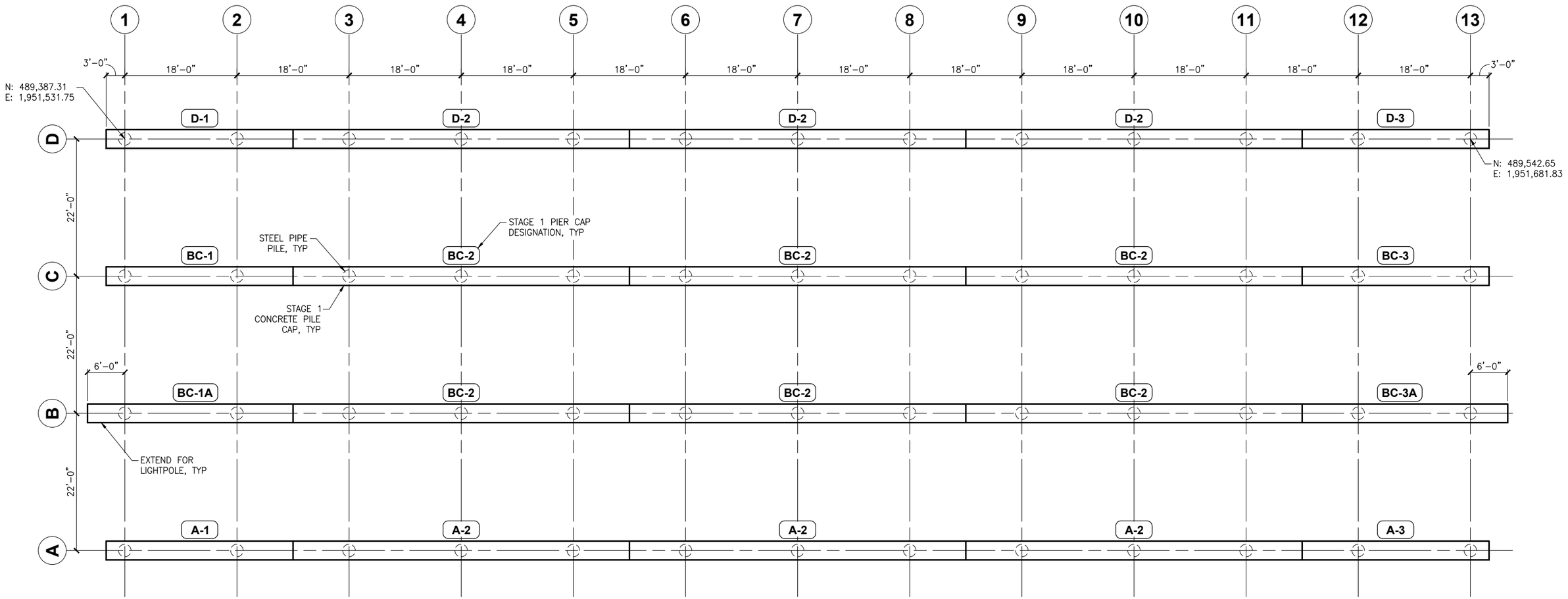
DESIGNED BY: xxx	STATE OF ALASKA DEPARTMENT OF TRANSPORTATION & PUBLIC FACILITIES SOUTHEAST REGION **MARINE** **SAND POINT** **DOCK REPLACEMENT** **PROJECT #SFHWY00006** **REVETMENT SECTION**
CHECKED BY: STAFF	
DRAWN BY: STAFF	

PATH: 09 DOCK ELEVATION_10 REVETMENT SECTION.DWG
TAB: 10 Tuesday, August 09, 2016 6:31:58 PM ALEJANDRO MENDOZA

REVISIONS			PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
NO.	DATE	DESCRIPTION				
			SFHWY00006	2016	10	29



PILE & CAP LAYOUT

8 0 8 16
GRAPHIC SCALE (FT)

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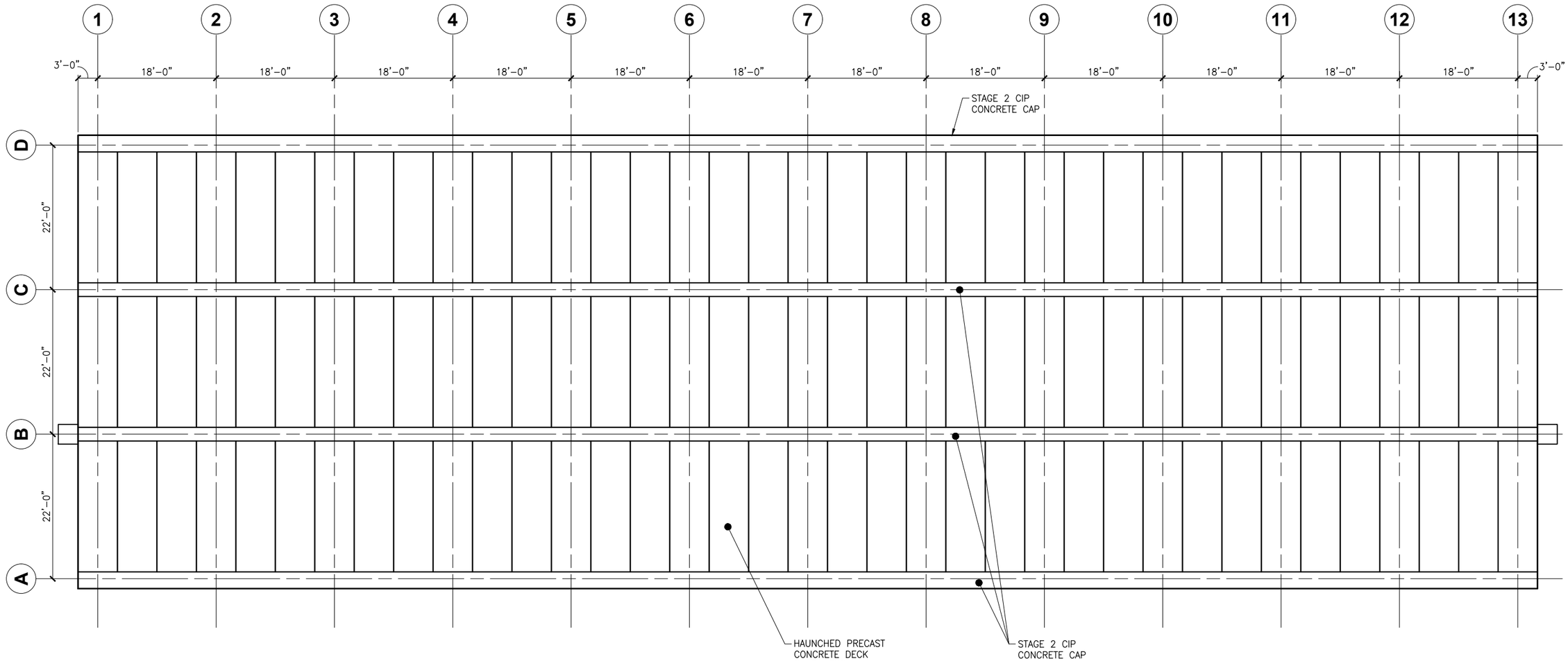
DESIGNED BY: xxx	STATE OF ALASKA DEPARTMENT OF TRANSPORTATION & PUBLIC FACILITIES SOUTHEAST REGION
CHECKED BY: STAFF	**MARINE** **SAND POINT** **DOCK REPLACEMENT** **PROJECT #SFHWY00006**
DRAWN BY: STAFF	**PILE & CAP LAYOUT**

PATH: 11 PILE & CAP LAYOUT.DWG
TAB: 11 Tuesday, August 09, 2016 6:32:13 PM ALEJANDRO MENDOZA

REVISIONS			PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
NO.	DATE	DESCRIPTION				
			SFHWY00006	2016	11	29



PANEL PLAN

8 0 8 16
GRAPHIC SCALE (FT)

65% SUBMITTAL
8/09/2016

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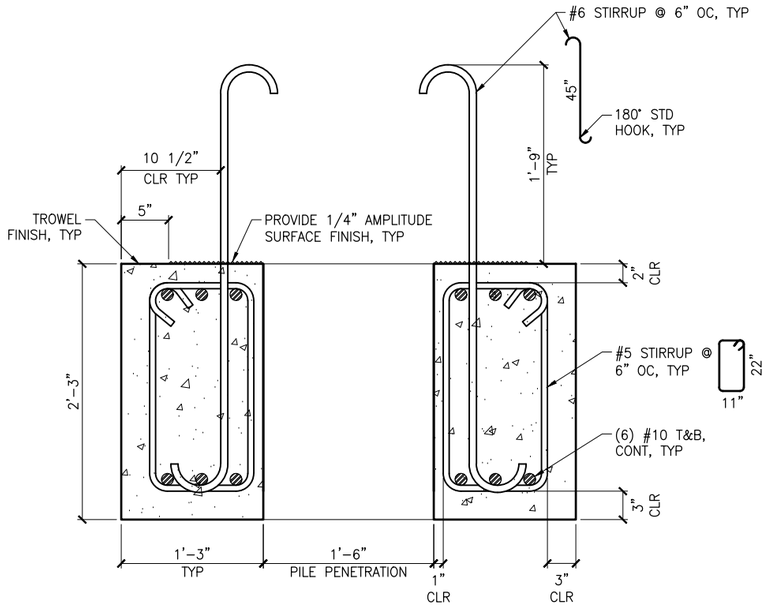
DESIGNED BY: xxx	STATE OF ALASKA DEPARTMENT OF TRANSPORTATION & PUBLIC FACILITIES SOUTHEAST REGION
CHECKED BY: STAFF	**MARINE** **SAND POINT** **DOCK REPLACEMENT** **PROJECT #SFHWY00006**
DRAWN BY: STAFF	**PANEL PLAN**

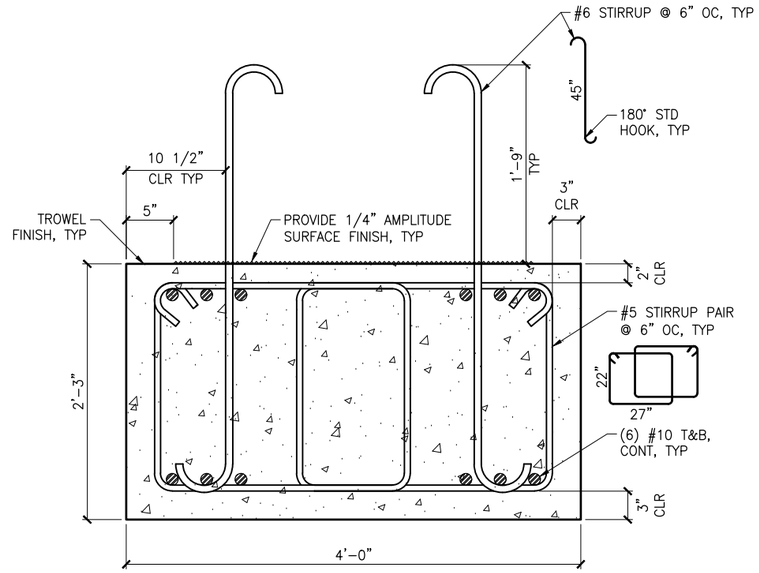
PATH: 12 PANEL PLAN.DWG
TAB: 12 Tuesday, August 09, 2016 6:32:28 PM ALEJANDRO MENDOZA

REVISIONS			PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
NO.	DATE	DESCRIPTION				
			SFHWY00006	2016	12	29



@ PILE

NTS



TYPICAL

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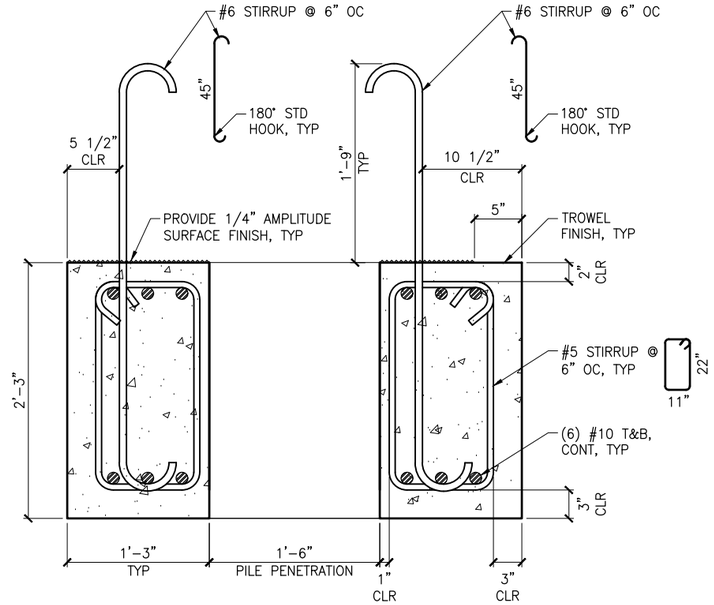
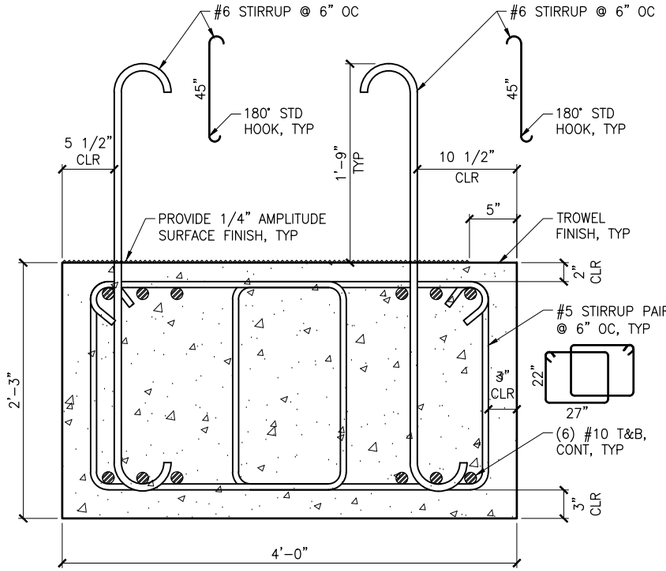
DESIGNED BY: xxx	STATE OF ALASKA DEPARTMENT OF TRANSPORTATION & PUBLIC FACILITIES SOUTHEAST REGION
CHECKED BY: STAFF	**MARINE** **SAND POINT** **DOCK REPLACEMENT** **PROJECT #SFHWY00006**
DRAWN BY: STAFF	**STAGE 1 CAP DETAILS** **BENT B&C**
PATH: 13_16 PILE BENT DETAILS.DWG	
TAB: 13 Tuesday, August 09, 2016 6:32:42 PM	ALEJANDRO MENDOZA

REVISIONS NO.	DATE	DESCRIPTION	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			SFHWY00006	2016	13	29



@ PILE
NTS



TYPICAL
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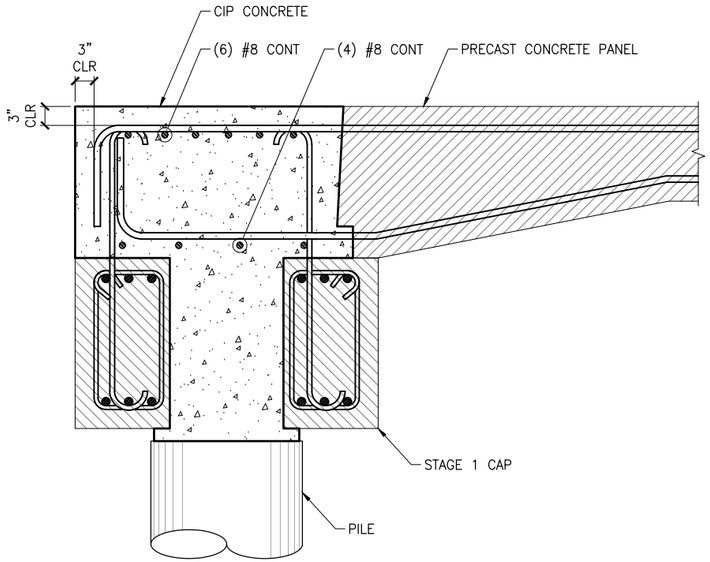
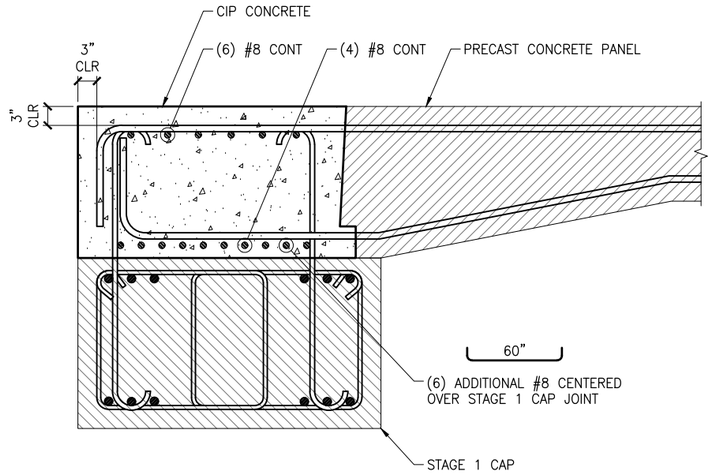
CHECKED BY: STAFF	**MARINE** **SAND POINT** **DOCK REPLACEMENT** **PROJECT #SFHWY00006**
DRAWN BY: STAFF	**STAGE 1 CAP DETAILS** **BENT D**

PATH: 13_16 PILE BENT DETAILS.DWG
TAB: 14 Tuesday, August 09, 2016 6:32:47 PM ALEJANDRO MENDOZA

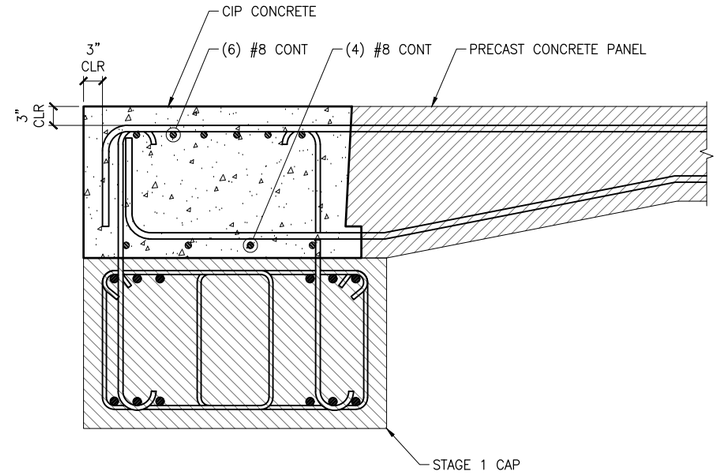
REVISIONS			PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
NO.	DATE	DESCRIPTION				
			SFHWY00006	2016	14	29



@ PILE
NTS



@ CAP JOINT
NTS



TYPICAL
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CHECKED BY: STAFF
DRAWN BY: STAFF

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION
& PUBLIC FACILITIES
SOUTHEAST REGION

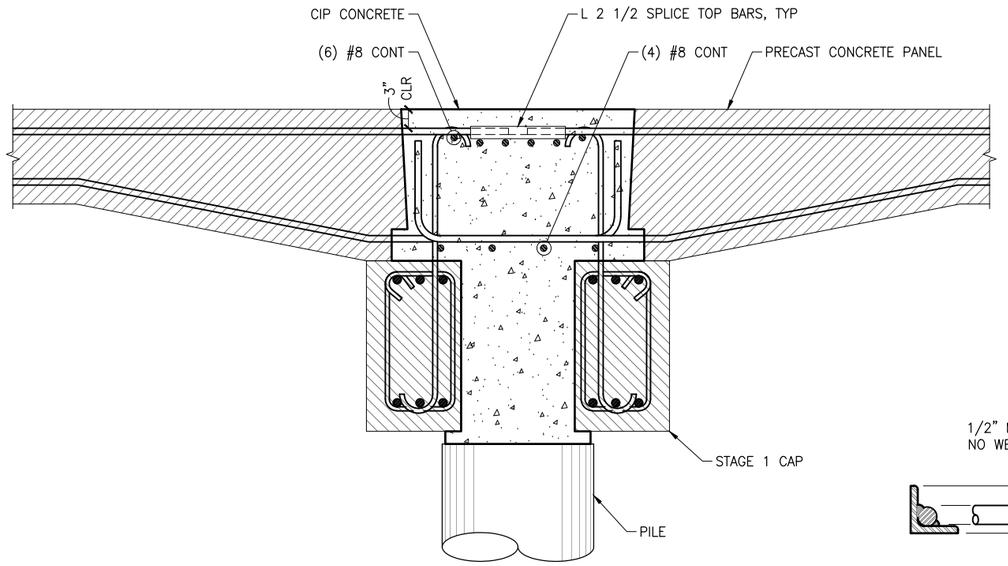
MARINE SAND POINT DOCK REPLACEMENT PROJECT #SFHWY00006

STAGE 2 CAP DETAILS BENT D

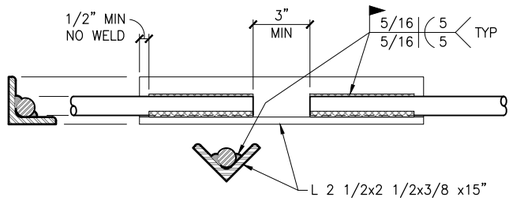
PATH: 13_16 PILE BENT DETAILS.DWG
TAB: 15 Tuesday, August 09, 2016 6:32:52 PM ALEJANDRO MENDOZA

REVISIONS NO.	DATE	DESCRIPTION

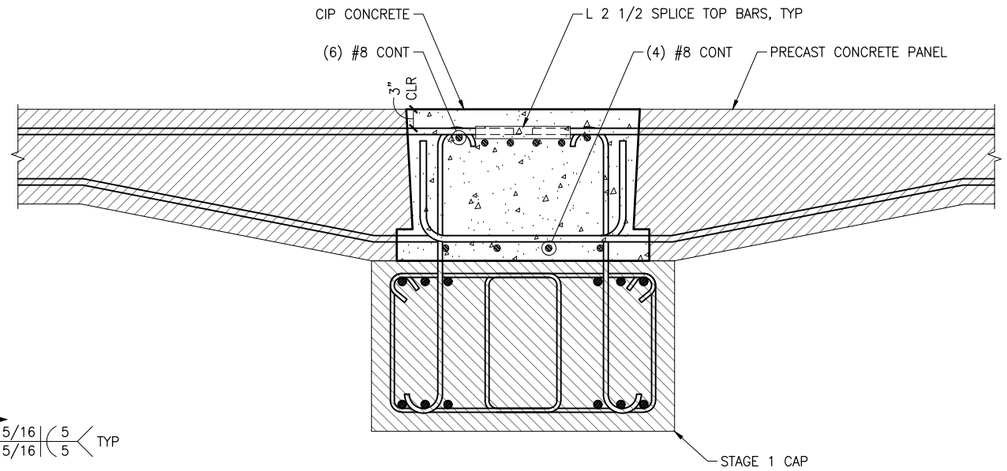
PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
SFHWY00006	2016	15	29



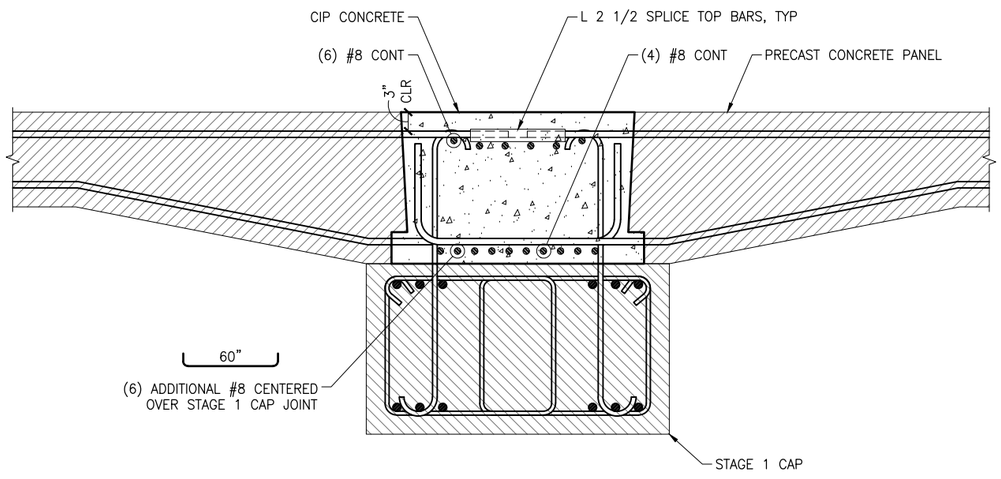
@ PILE
NTS



FIELD SPLICE WELD DETAIL
NTS



TYPICAL
NTS



@ CAP JOINT
NTS

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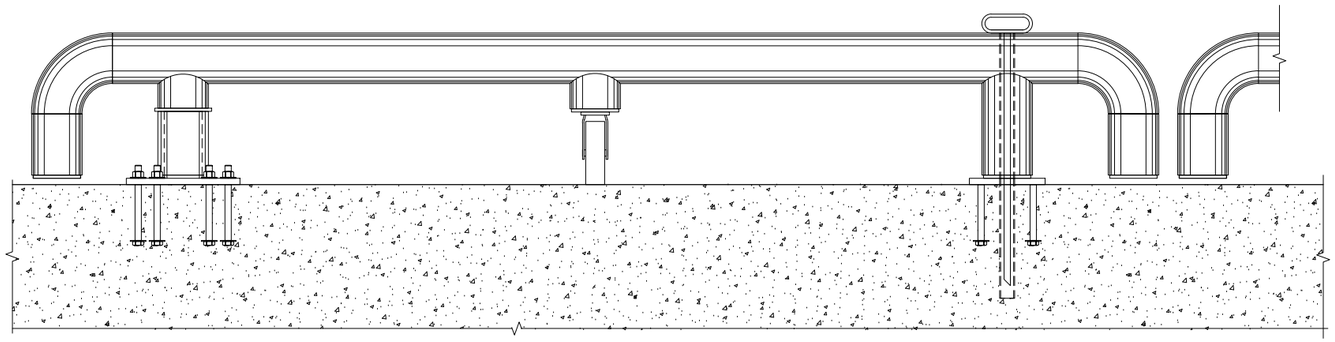
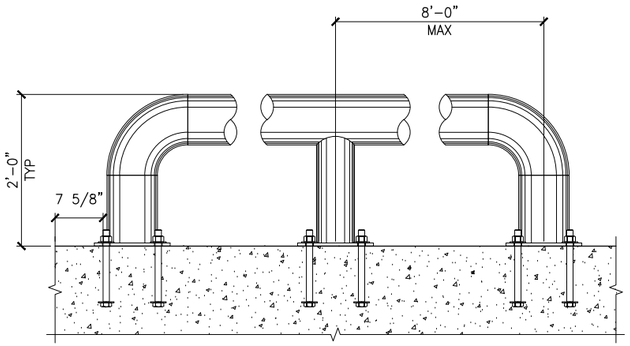
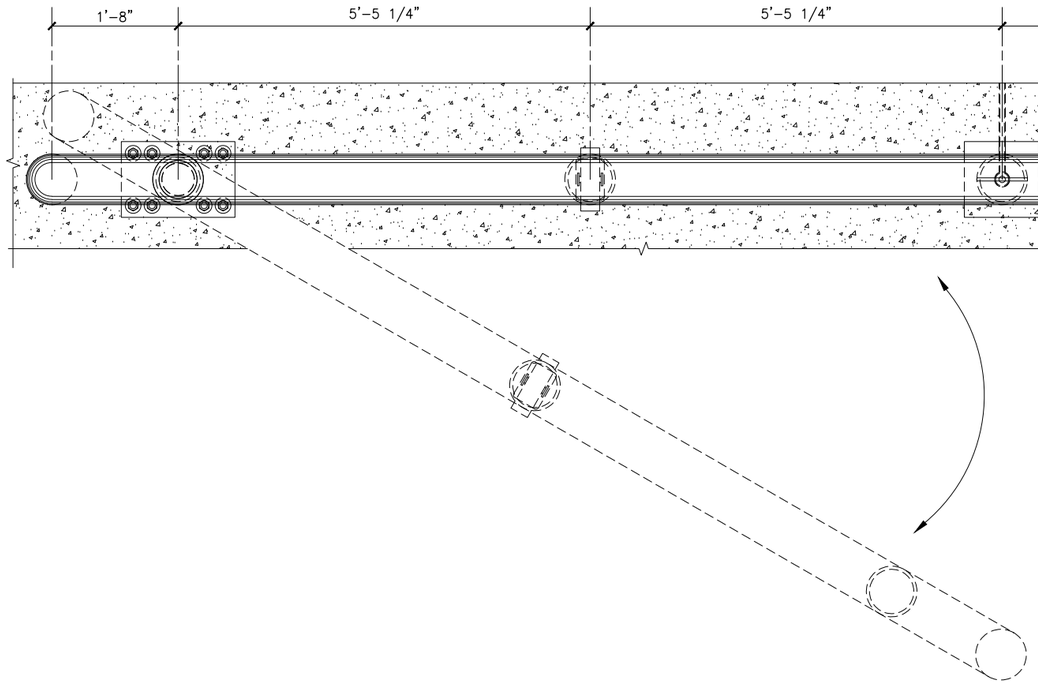
DESIGNED BY: xxx	STATE OF ALASKA DEPARTMENT OF TRANSPORTATION & PUBLIC FACILITIES SOUTHEAST REGION
CHECKED BY: STAFF	**MARINE** **SAND POINT** **DOCK REPLACEMENT** **PROJECT #SFHWY00006**
DRAWN BY: STAFF	**STAGE 2 CAP DETAILS** **BENT B&C**

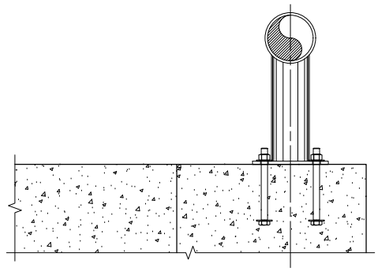
PATH: 13_16 PILE BENT DETAILS.DWG
TAB: 16 Tuesday, August 09, 2016 6:32:56 PM ALEJANDRO MENDOZA

REVISIONS			PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
NO.	DATE	DESCRIPTION				
			SFHWY00006	2016	16	29









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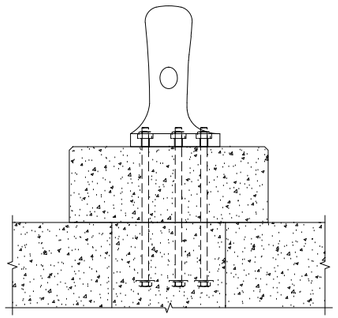
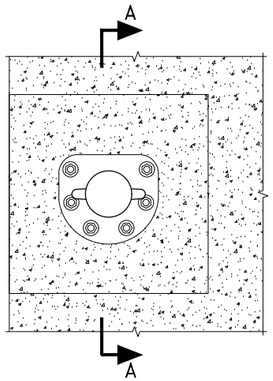
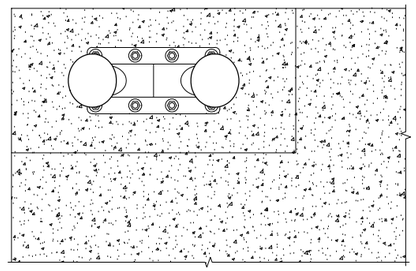
DESIGNED BY: xxx	STATE OF ALASKA DEPARTMENT OF TRANSPORTATION & PUBLIC FACILITIES SOUTHEAST REGION
CHECKED BY: STAFF	**MARINE** **SAND POINT** **DOCK REPLACEMENT** **PROJECT #SFHWY00006**
DRAWN BY: STAFF	**DOCK DETAILS** **1 OF 2**

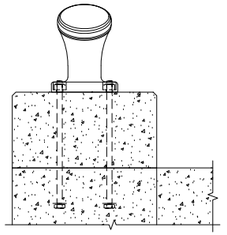
PATH: 17_18 DOCK DETAILS 1 OF 2.DWG
TAB: 17 Tuesday, August 09, 2016 6:33:12 PM ALEJANDRO MENDOZA

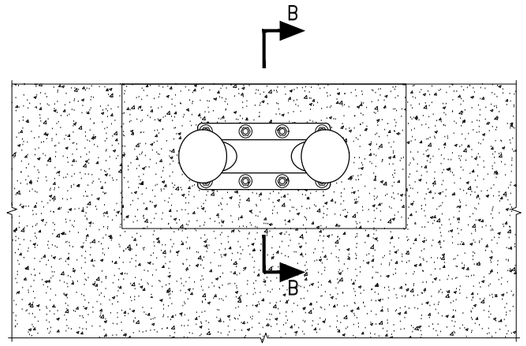
REVISIONS			PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
NO.	DATE	DESCRIPTION				
			SFHWY00006	2016	17	29











65% SUBMITTAL
8/09/2016

DO NOT SCALE FROM THESE DRAWINGS USE DIMENSIONS

DESIGNED BY: xxx
CHECKED BY: STAFF
DRAWN BY: STAFF

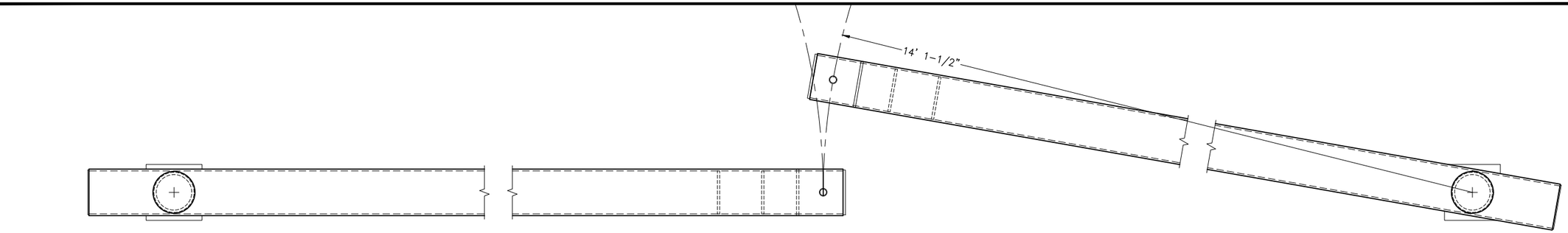
STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION
& PUBLIC FACILITIES
SOUTHEAST REGION

MARINE
SAND POINT
DOCK REPLACEMENT
PROJECT #SFHWY00006

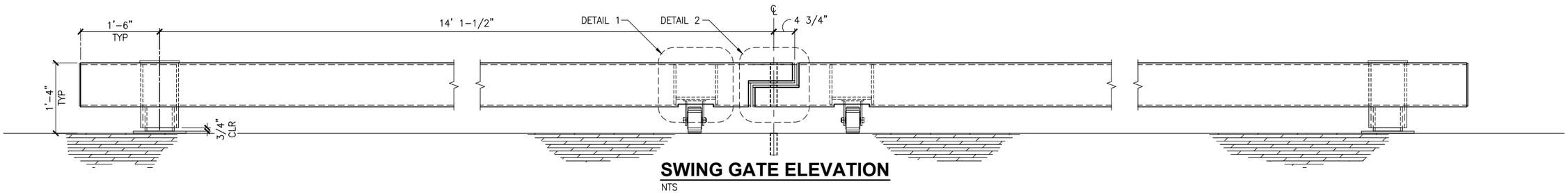
DOCK DETAILS
2 OF 2

PATH: 17_18 DOCK DETAILS 1 OF 2.DWG
TAB: 18 Tuesday, August 09, 2016 6:33:16 PM ALEJANDRO MENDOZA

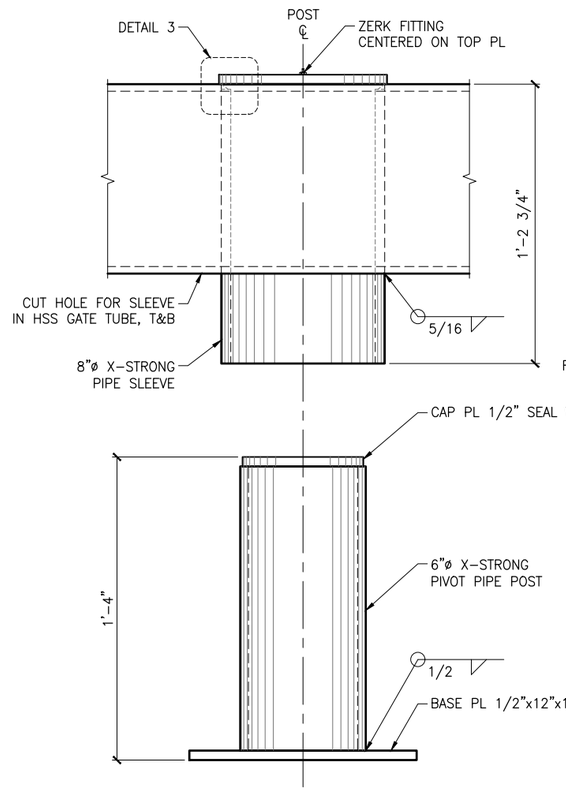
REVISIONS NO.	DATE	DESCRIPTION	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			SFHWY00006	2016	18	29

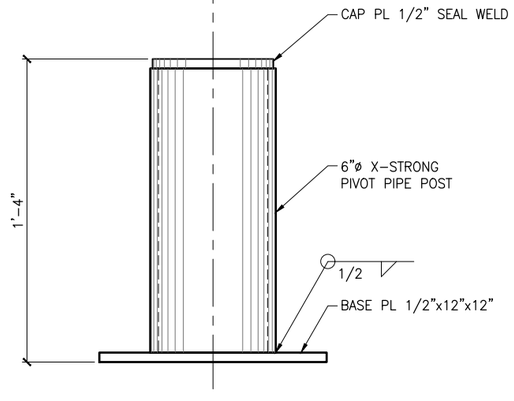


SWING GATE PLAN
NTS

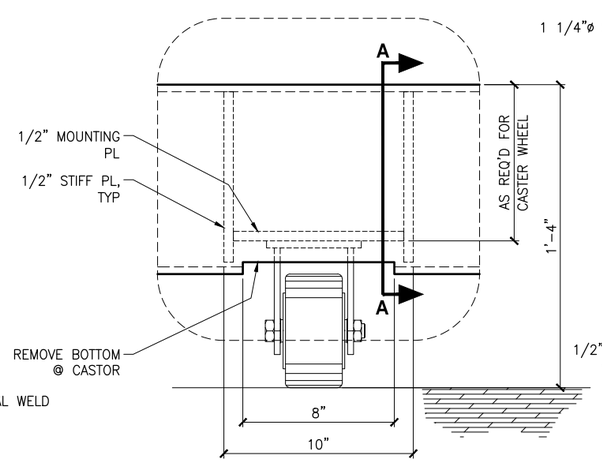


SWING GATE ELEVATION
NTS

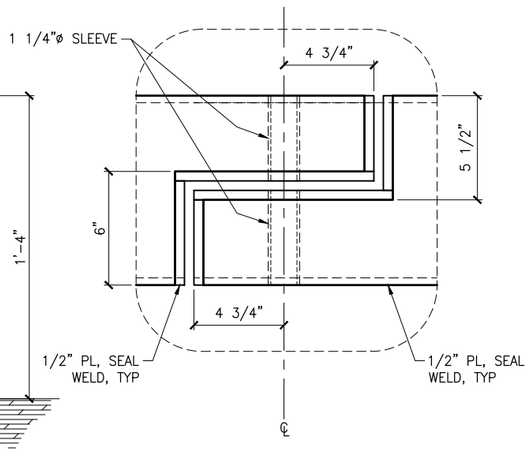




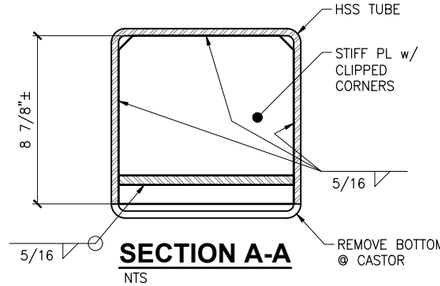
SWING GATE PIVOT POST
NTS



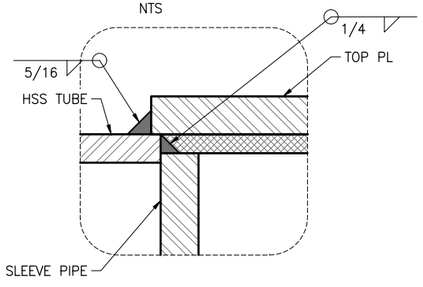
DETAIL 1
NTS



DETAIL 2
NTS



SECTION A-A
NTS



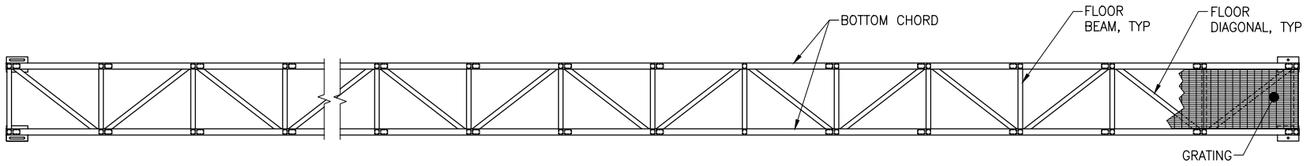
DETAIL 3
NTS

65% SUBMITTAL
8/09/2016

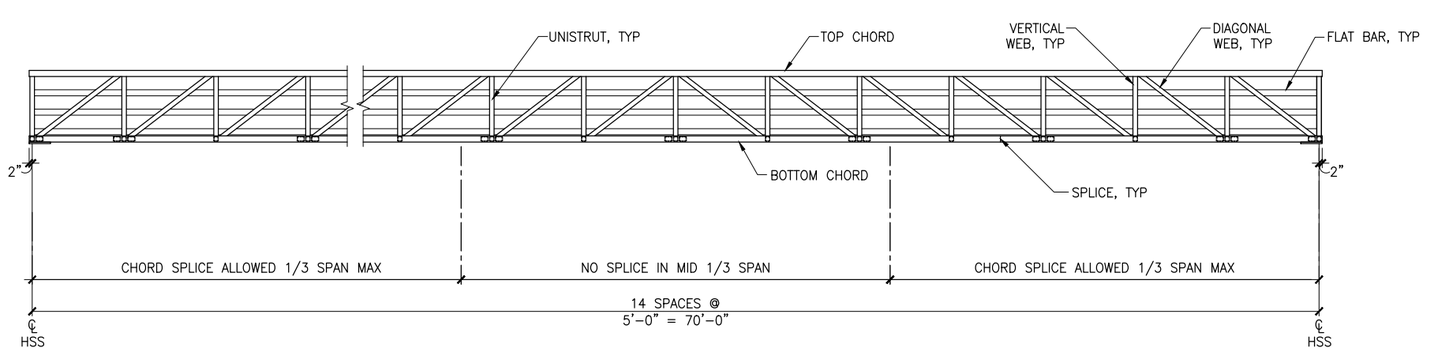
DO NOT SCALE FROM THESE DRAWINGS USE DIMENSIONS

DESIGNED BY: xxx	STATE OF ALASKA DEPARTMENT OF TRANSPORTATION & PUBLIC FACILITIES SOUTHEAST REGION
	MARINE **SAND POINT** **DOCK REPLACEMENT** **PROJECT #SFHWY00006**
	SWING GATE DETAILS
CHECKED BY: STAFF	
DRAWN BY: STAFF	
PATH: 19 SWING GATE DETAILS.DWG	
TAB: 19 Tuesday, August 09, 2016 6:33:31 PM	ALEJANDRO MENDOZA

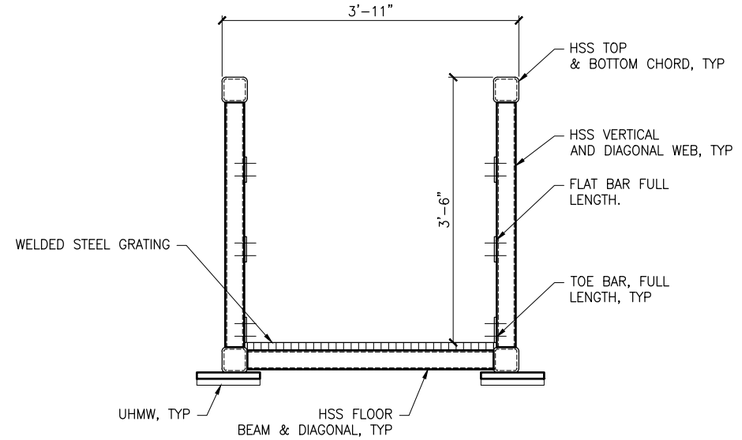
REVISIONS NO.	DATE	DESCRIPTION	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			SFHWY00006	2016	19	29



FLOOR PLAN
NTS



ELEVATION
NTS



END ELEVATION
NTS

65% SUBMITTAL
8/09/2016

DO NOT SCALE FROM THESE DRAWINGS USE DIMENSIONS

DESIGNED BY: xxx	STATE OF ALASKA DEPARTMENT OF TRANSPORTATION & PUBLIC FACILITIES SOUTHEAST REGION
CHECKED BY: STAFF	**MARINE** **SAND POINT** **DOCK REPLACEMENT** **PROJECT #SFHWY00006**
DRAWN BY: STAFF	**CATWALK DETAILS**

PATH: 20 CATWALK DETAILS.DWG
TAB: 20 Tuesday, August 09, 2016 6:33:47 PM ALEJANDRO MENDOZA

REVISIONS			PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
NO.	DATE	DESCRIPTION				
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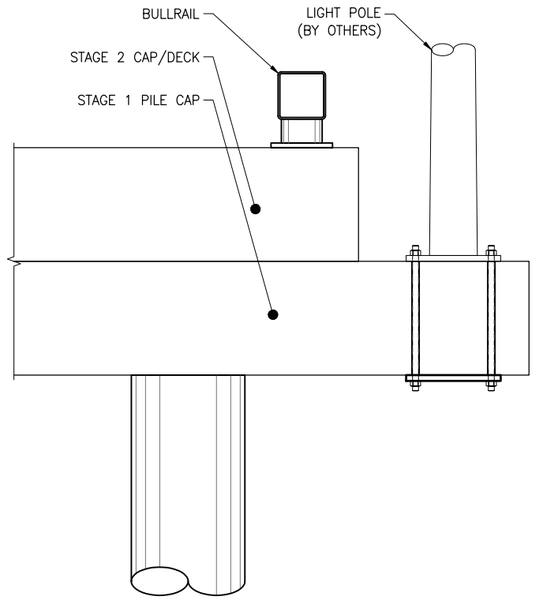


DOCK LIGHT POLE MOUNTING DETAIL
NTS

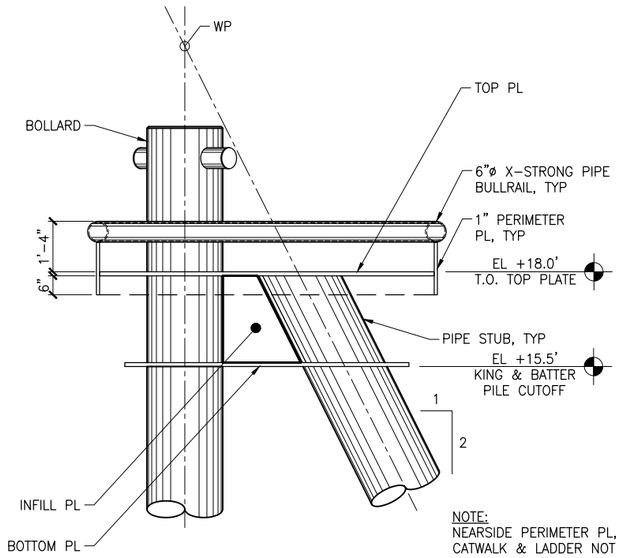
65% SUBMITTAL
8/09/2016

DO NOT SCALE FROM THESE DRAWINGS USE DIMENSIONS

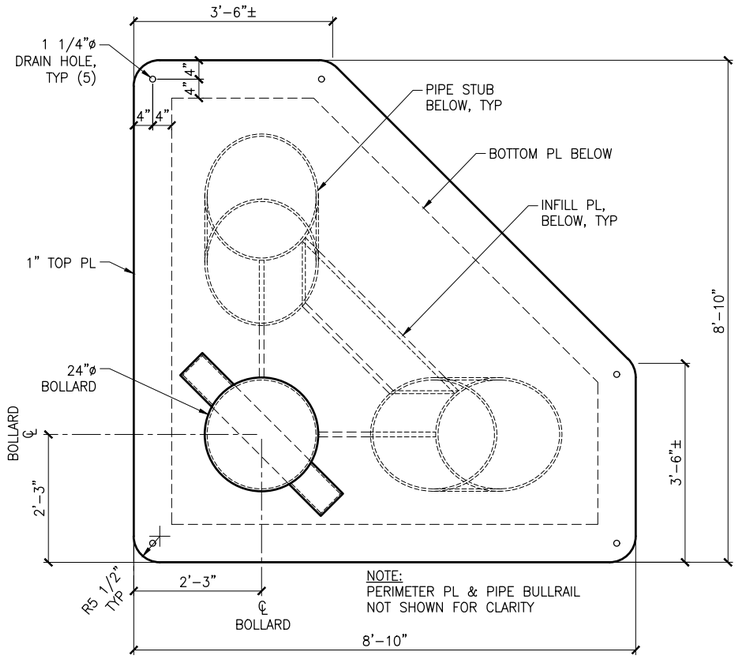
DESIGNED BY: xxx	STATE OF ALASKA DEPARTMENT OF TRANSPORTATION & PUBLIC FACILITIES SOUTHEAST REGION
CHECKED BY: STAFF	**MARINE** **SAND POINT** **DOCK REPLACEMENT** **PROJECT #SFHWY00006**
DRAWN BY: STAFF	**LIGHT POLE** **MOUNTING DETAILS**

PATH: 21 LIGHT POLE MOUNTING DETAILS.DWG
TAB: 21 Tuesday, August 09, 2016 6:34:02 PM ALEJANDRO MENDOZA

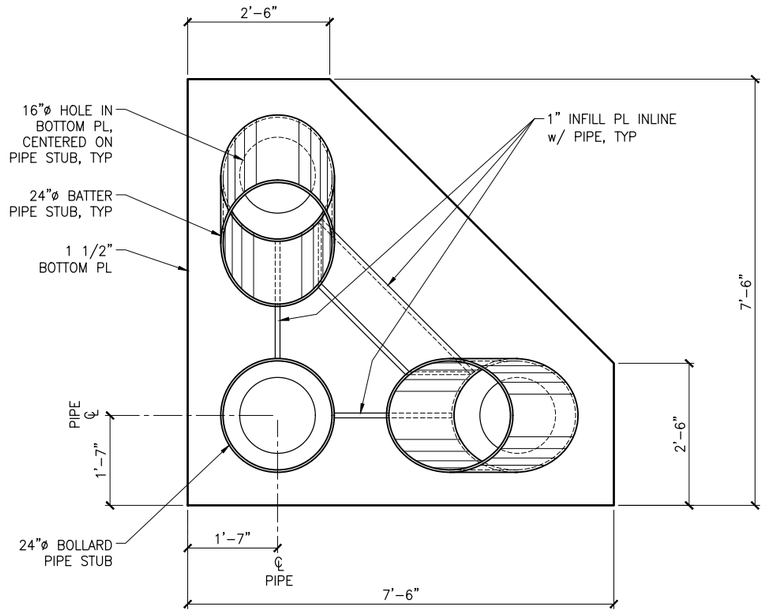
REVISIONS			PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
NO.	DATE	DESCRIPTION				
			SFHWY00006	2016	21	29



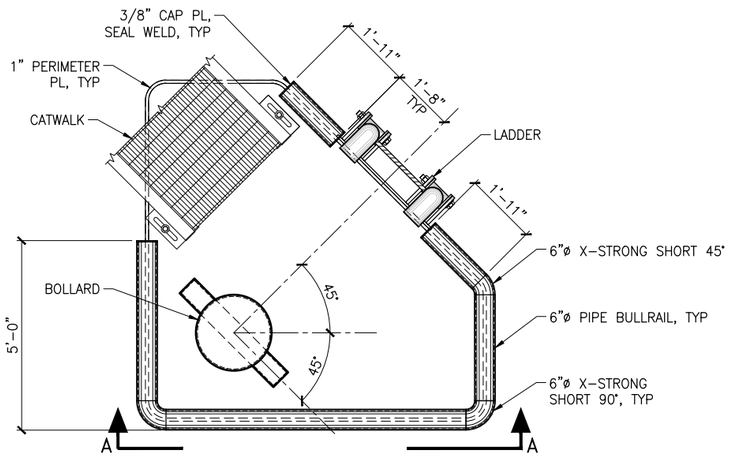
DOLPHIN ELEVATION A-A
NTS



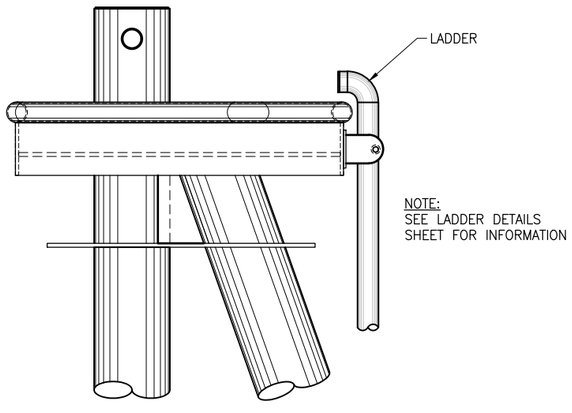
TOP PLATE PLAN
NTS



BOTTOM PLATE PLAN
NTS



DOLPHIN PLAN



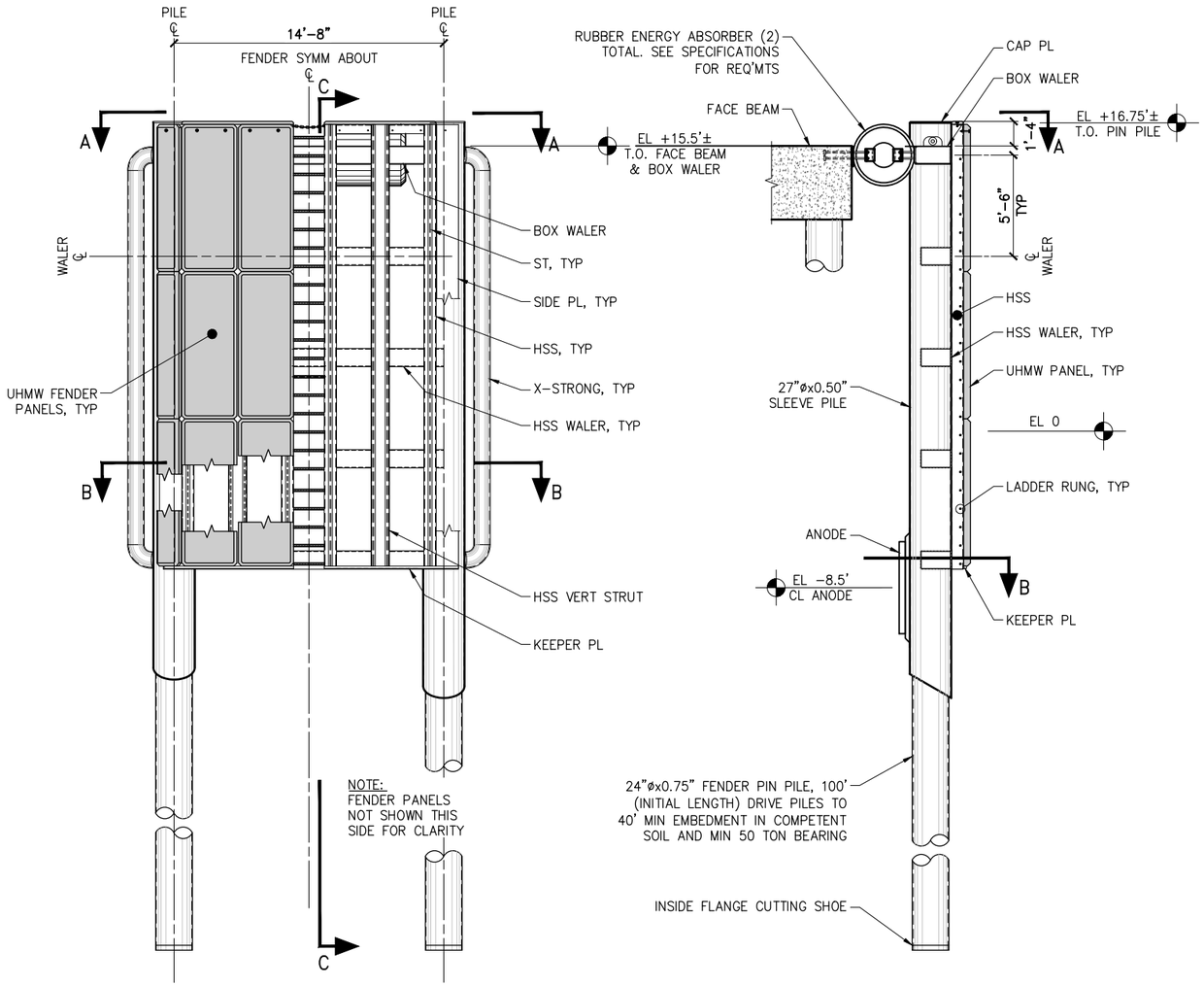
DOLPHIN LADDER ELEVATION
NTS

65% SUBMITTAL
8/09/2016

DO NOT SCALE FROM THESE DRAWINGS USE DIMENSIONS

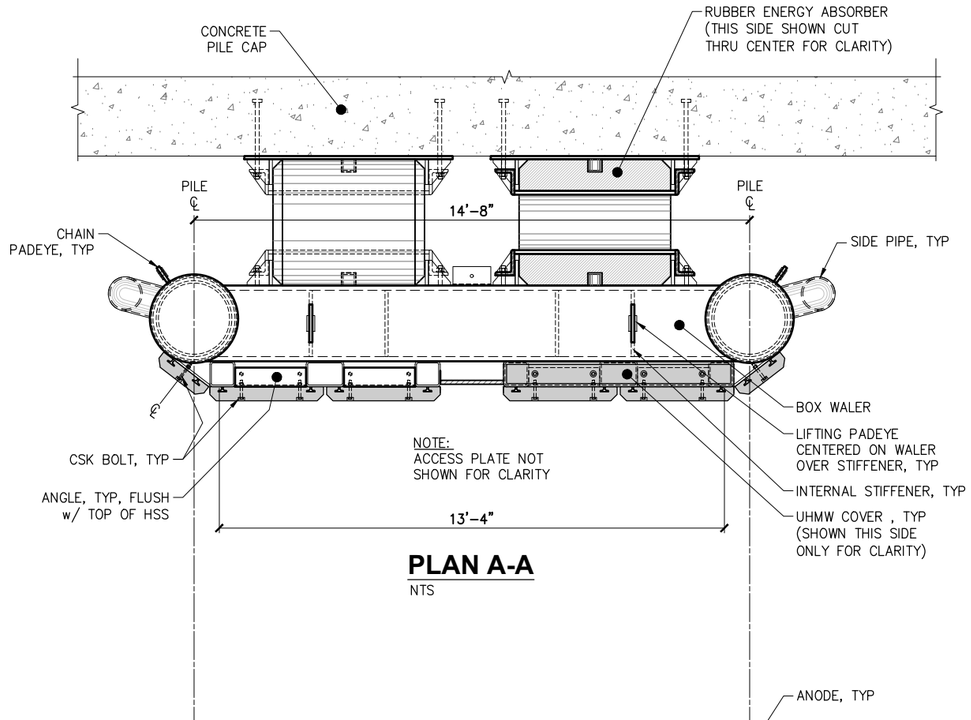
DESIGNED BY: xxx	STATE OF ALASKA DEPARTMENT OF TRANSPORTATION & PUBLIC FACILITIES SOUTHEAST REGION
	MARINE **SAND POINT** **DOCK REPLACEMENT** **PROJECT #SFHWY00006**
CHECKED BY: STAFF	**MOORING DOLPHIN DETAILS**
DRAWN BY: STAFF	
PATH: 22 MOORING DOLPHIN DETAILS.DWG TAB: 22 Tuesday, August 09, 2016 6:34:18 PM	ALEJANDRO MENDOZA

REVISIONS NO.	DATE	DESCRIPTION	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			SFHWY00006	2016	22	29

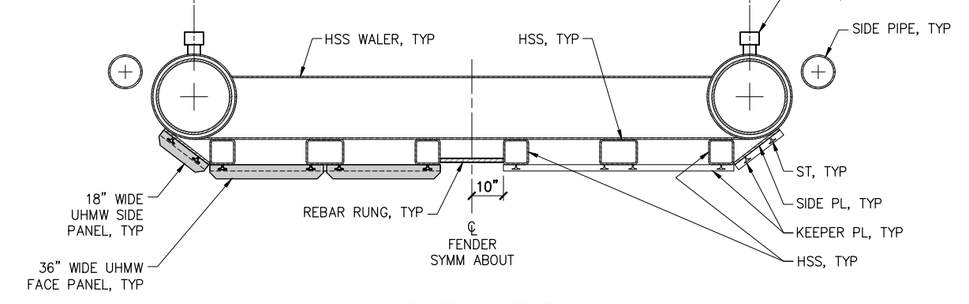


ELEVATION
NTS

SECTION C-C
NTS



PLAN A-A
NTS



SECTION B-B
NTS

65% SUBMITTAL
8/09/2016

DO NOT SCALE FROM THESE DRAWINGS USE DIMENSIONS

DESIGNED BY: xxx	STATE OF ALASKA DEPARTMENT OF TRANSPORTATION & PUBLIC FACILITIES SOUTHEAST REGION
CHECKED BY: STAFF	**MARINE** **SAND POINT** **DOCK REPLACEMENT** **PROJECT #SFHWY00006**
DRAWN BY: STAFF	**FENDER DETAILS**

PATH: 23 FENDER DETAILS.DWG
TAB: 23 Tuesday, August 09, 2016 6:34:34 PM ALEJANDRO MENDOZA

REVISIONS NO.	DATE	DESCRIPTION	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
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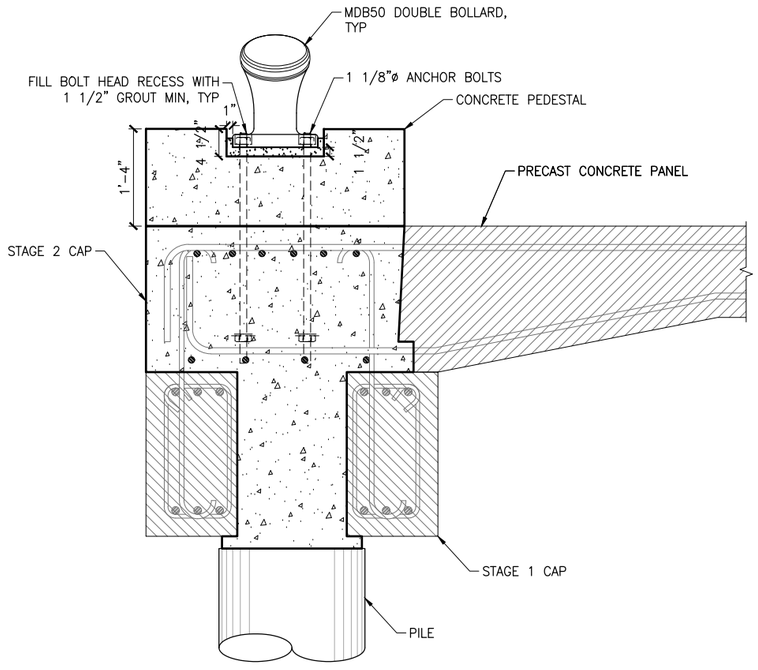
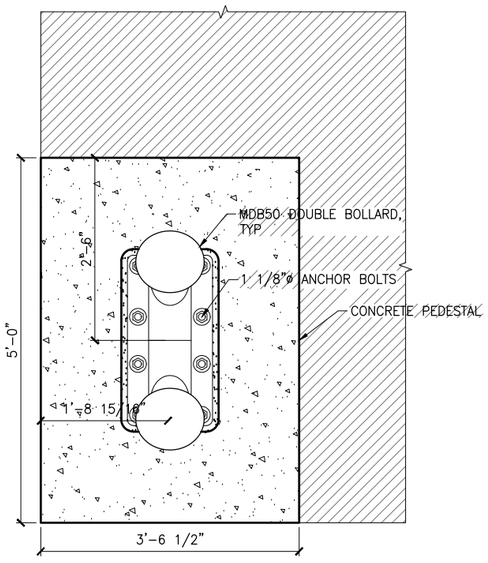


DOUBLE BOLLARD, CORNER



DOUBLE BOLLARD CORNER PLAN

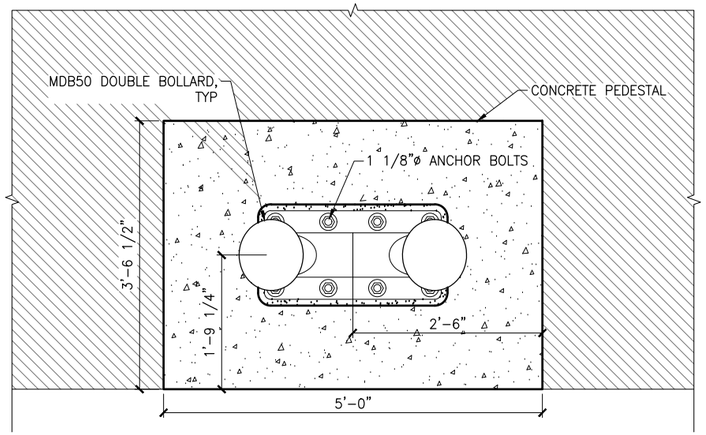
65% SUBMITTAL
8/09/2016

DO NOT SCALE FROM THESE DRAWINGS USE DIMENSIONS

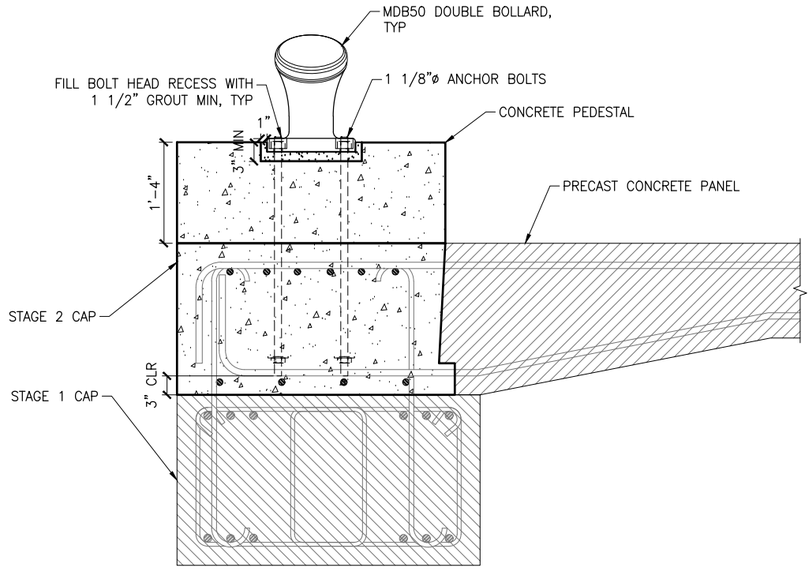
DESIGNED BY: xxx	STATE OF ALASKA DEPARTMENT OF TRANSPORTATION & PUBLIC FACILITIES SOUTHEAST REGION
CHECKED BY: STAFF	**MARINE** **SAND POINT** **DOCK REPLACEMENT** **PROJECT #SFHWY00006**
DRAWN BY: STAFF	**DOUBLE BOLLARD** **CORNER DETAILS**

PATH: 24_26 BOLLARD DETAILS.DWG
TAB: 24 Tuesday, August 09, 2016 6:34:49 PM ALEJANDRO MENDOZA

REVISIONS			PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
NO.	DATE	DESCRIPTION				
			SFHWY00006	2016	24	29



DOUBLE BIT BOLLARD PLAN, TYP



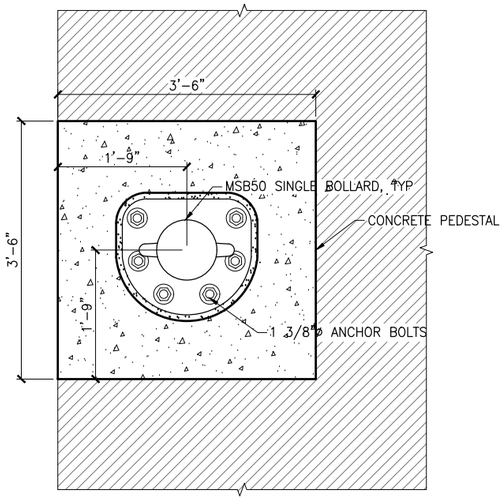
DOUBLE BIT BOLLARD,TYP

65% SUBMITTAL
8/09/2016

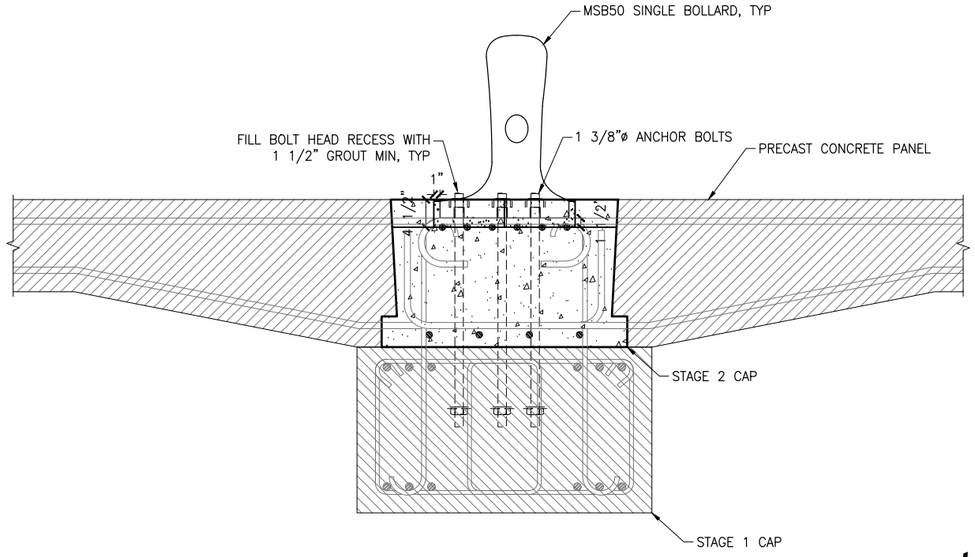
DO NOT SCALE FROM THESE DRAWINGS USE DIMENSIONS

DESIGNED BY: xxx	STATE OF ALASKA DEPARTMENT OF TRANSPORTATION & PUBLIC FACILITIES SOUTHEAST REGION
CHECKED BY: STAFF	**MARINE** **SAND POINT** **DOCK REPLACEMENT** **PROJECT #SFHWY00006**
DRAWN BY: STAFF	**DOUBLE BOLLARD DETAILS**
PATH: 24_26 BOLLARD DETAILS.DWG TAB: 25 Tuesday, August 09, 2016 6:34:53 PM	ALEJANDRO MENDOZA

REVISIONS NO.	DATE	DESCRIPTION	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			SFHWY00006	2016	25	29



SINGLE BIT BOLLARD PLAN



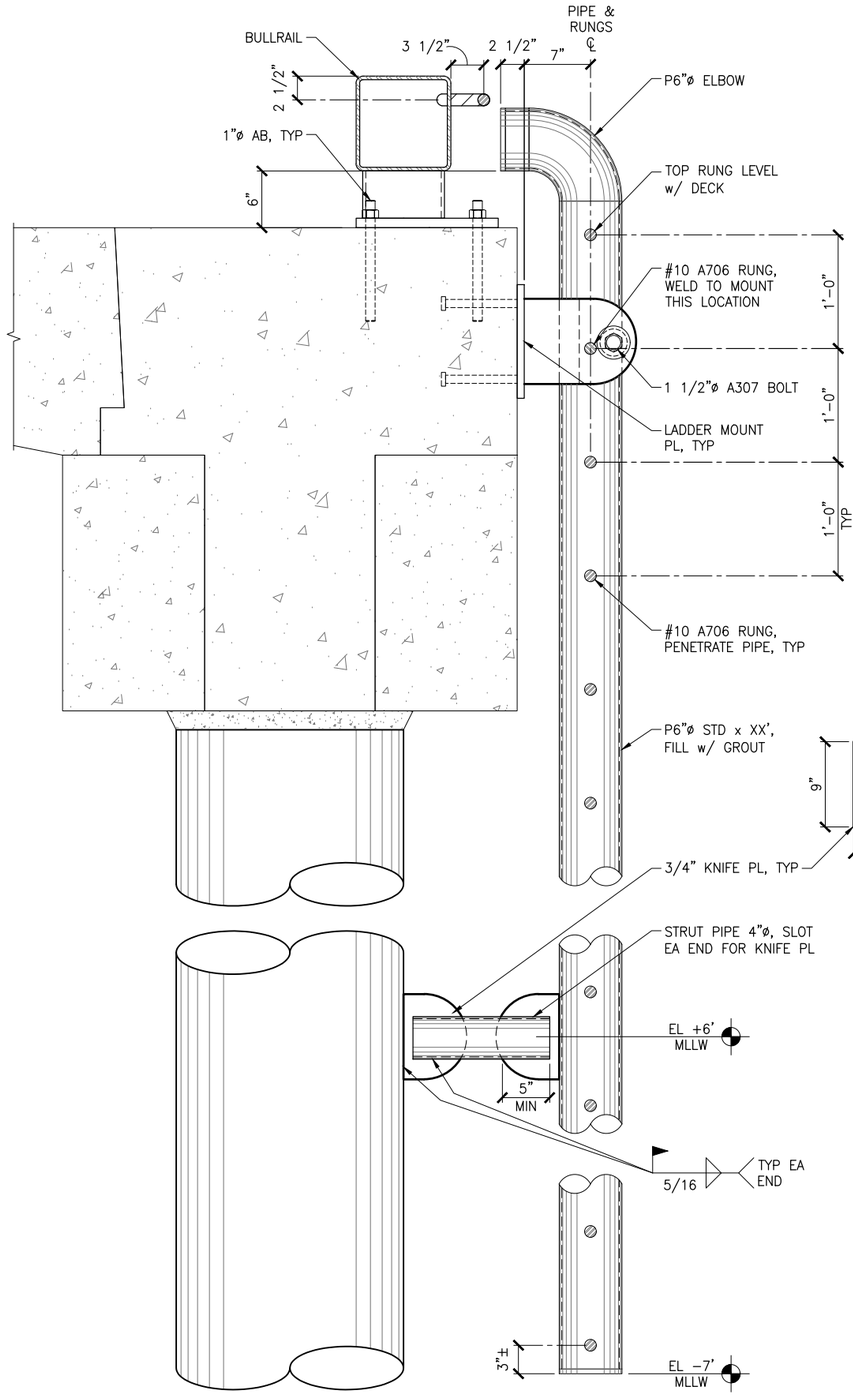
SINGLE BIT BOLLARD, TYP

65% SUBMITTAL
8/09/2016

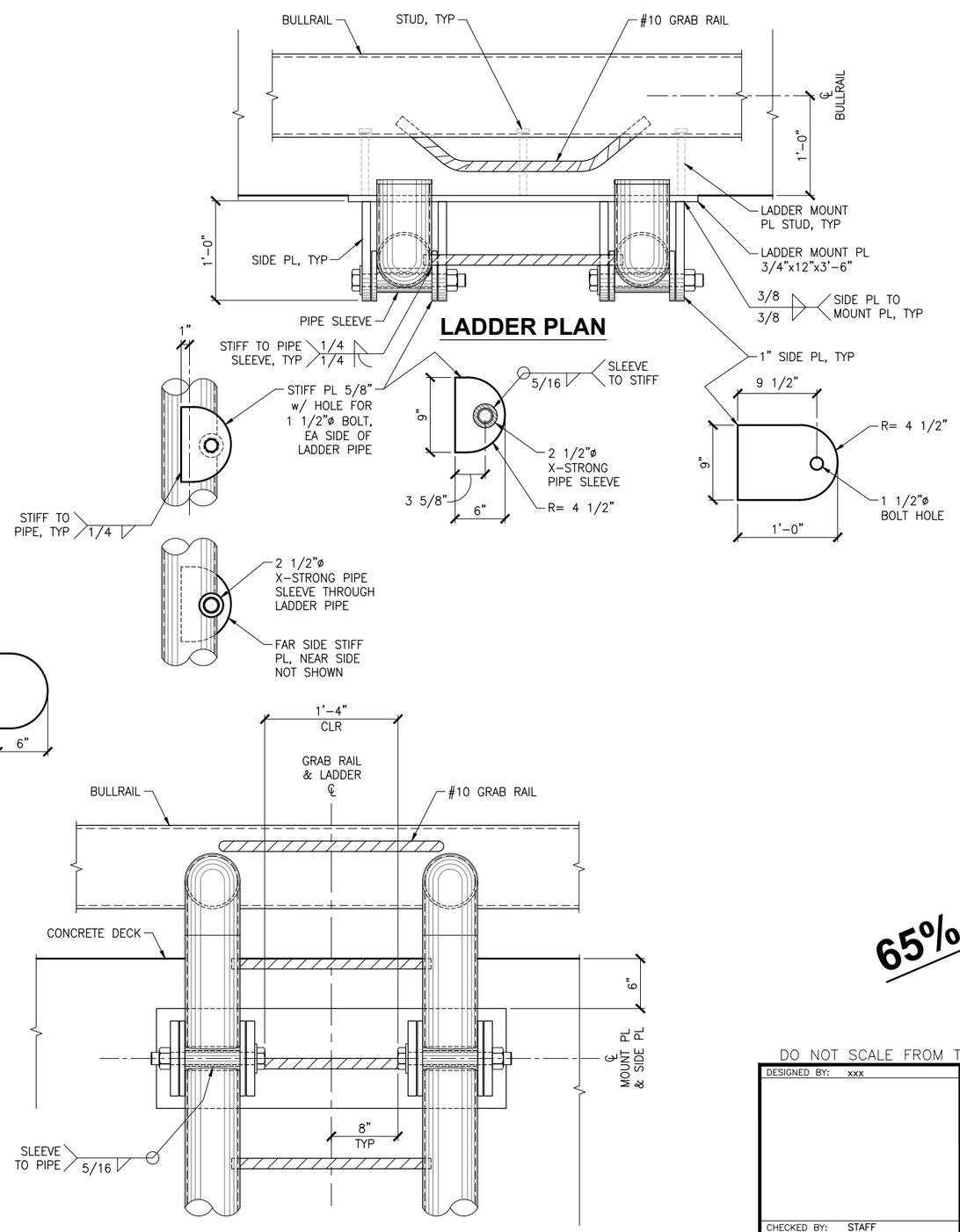
DO NOT SCALE FROM THESE DRAWINGS USE DIMENSIONS

DESIGNED BY: xxx	STATE OF ALASKA DEPARTMENT OF TRANSPORTATION & PUBLIC FACILITIES SOUTHEAST REGION
CHECKED BY: STAFF	**MARINE** **SAND POINT** **DOCK REPLACEMENT** **PROJECT #SFHWY00006**
DRAWN BY: STAFF	**SINGLE BOLLARD DETAILS**
PATH: 24_26 BOLLARD DETAILS.DWG TAB: 26 Tuesday, August 09, 2016 6:34:58 PM	ALEJANDRO MENDOZA

REVISIONS			PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
NO.	DATE	DESCRIPTION				
			SFHWY00006	2016	26	29



LADDER SIDE SECTION



LADDER PLAN

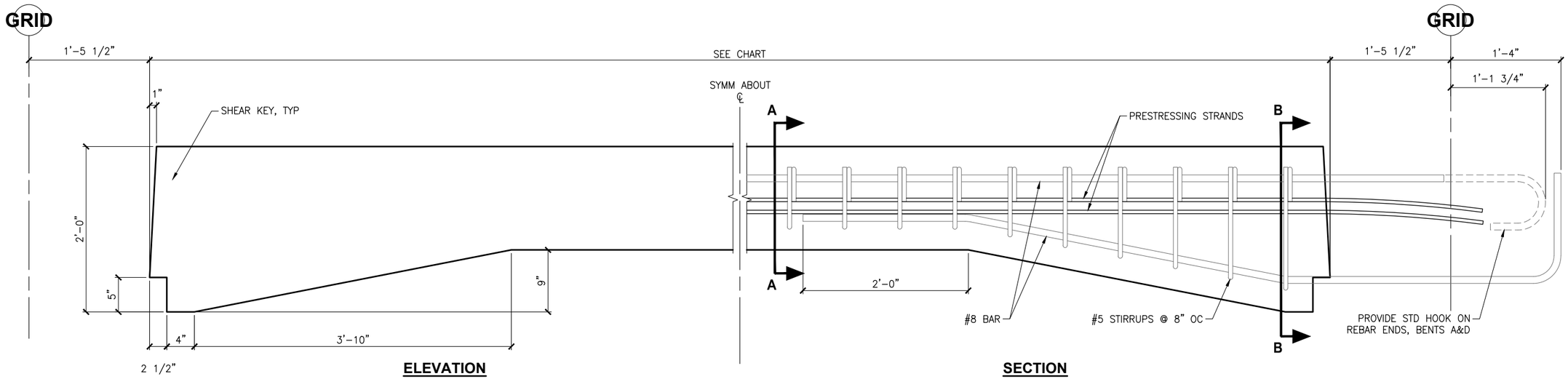
LADDER FACE ELEVATION

65% SUBMITTAL
8/09/2016

DO NOT SCALE FROM THESE DRAWINGS USE DIMENSIONS

DESIGNED BY: xxx	STATE OF ALASKA DEPARTMENT OF TRANSPORTATION & PUBLIC FACILITIES SOUTHEAST REGION
CHECKED BY: STAFF	**MARINE** **SAND POINT** **DOCK REPLACEMENT** **PROJECT #SFHWY00006**
DRAWN BY: STAFF	**BULLRAIL & LADDER DETAILS**
PATH: 27 BULLRAIL & LADDER DETAILS.DWG TAB: 27 Tuesday, August 09, 2016 6:35:13 PM	ALEJANDRO MENDOZA

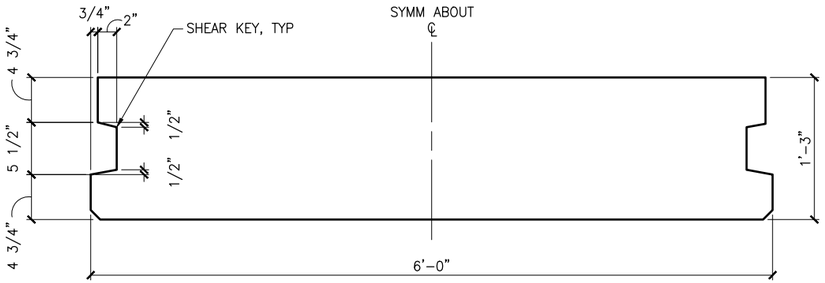
REVISIONS NO.	DATE	DESCRIPTION	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			SFHWY00006	2016	27	29



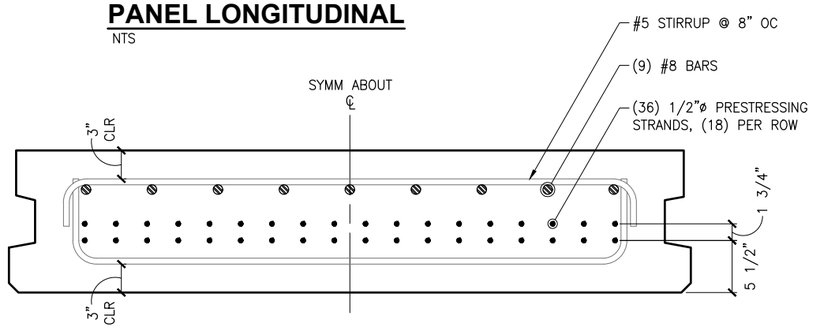
ELEVATION

SECTION

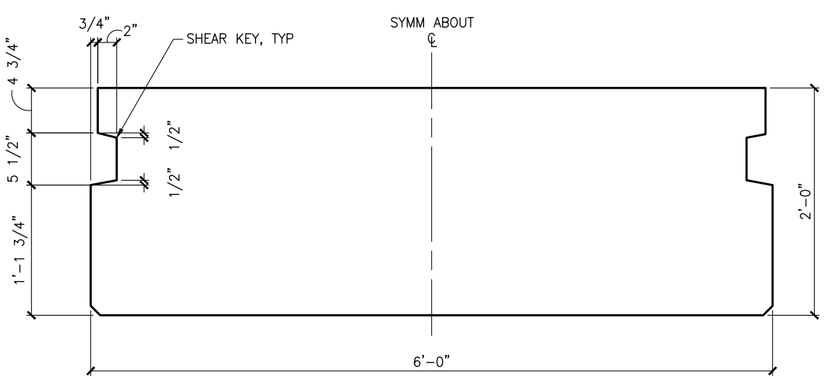
PANEL LONGITUDINAL
NTS



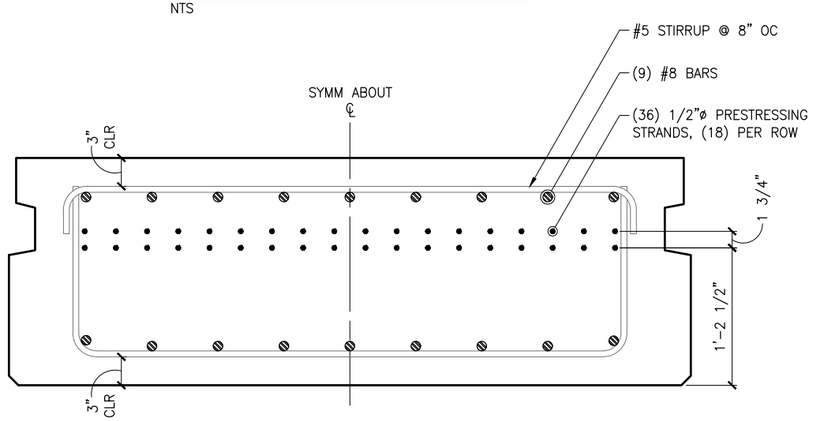
SECTION A-A
NTS



SECTION A-A REINFORCING
NTS



SECTION B-B
NTS



SECTION B-B REINFORCING
NTS

65% SUBMITTAL
8/09/2016

DO NOT SCALE FROM THESE DRAWINGS USE DIMENSIONS

DESIGNED BY: xxx
CHECKED BY: STAFF
DRAWN BY: STAFF

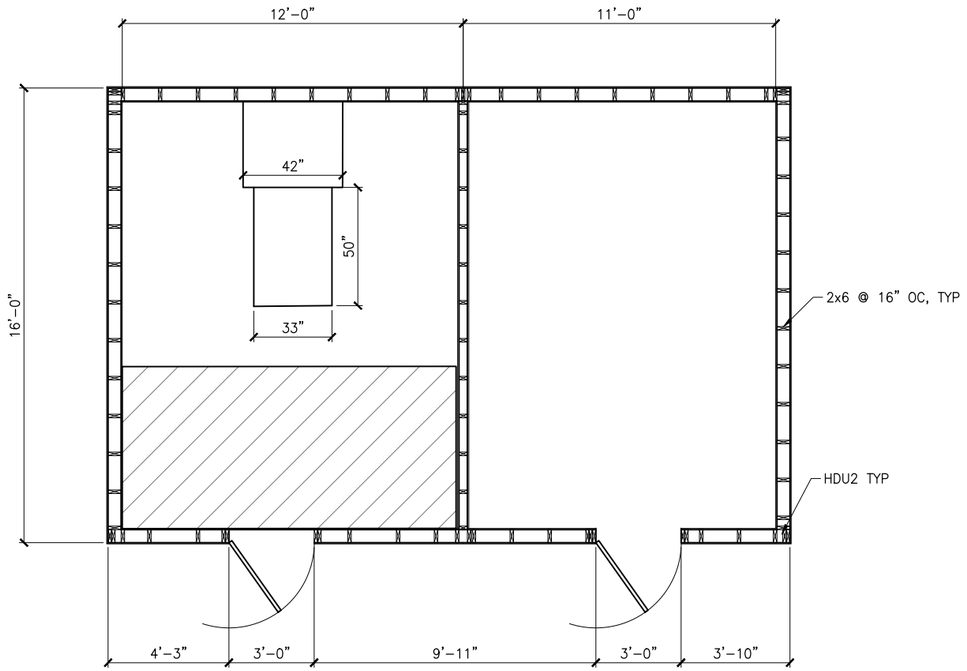
STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION
& PUBLIC FACILITIES
SOUTHEAST REGION

MARINE
SAND POINT
DOCK REPLACEMENT
PROJECT #SFHWY00006

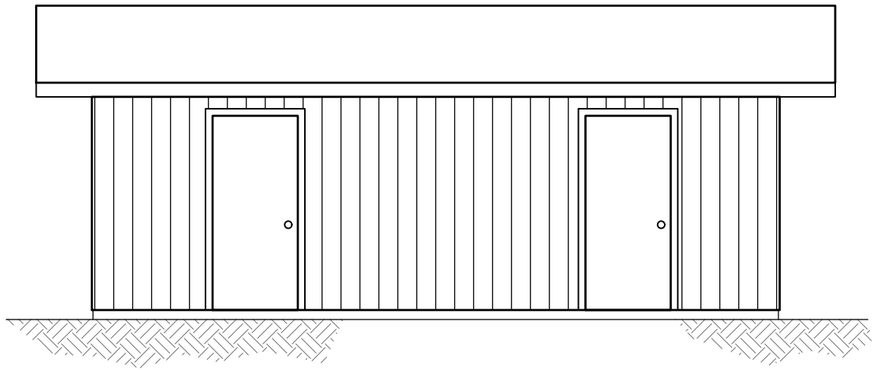
HAUNCHED PANEL DETAILS

PATH: 28 HAUNCHED PANEL DETAILS.DWG
TAB: 28 Tuesday, August 09, 2016 6:35:27 PM ALEJANDRO MENDOZA

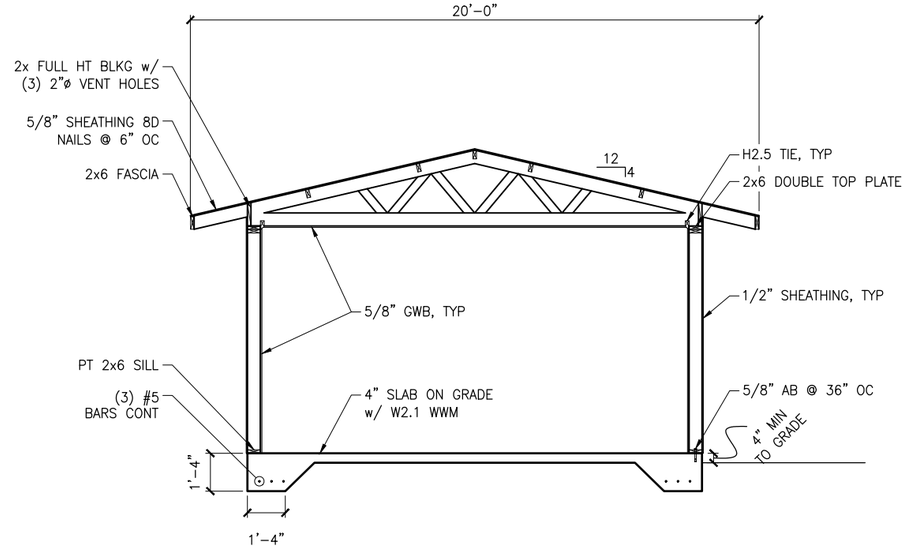
REVISIONS NO.	DATE	DESCRIPTION	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			SFHWY00006	2016	28	29



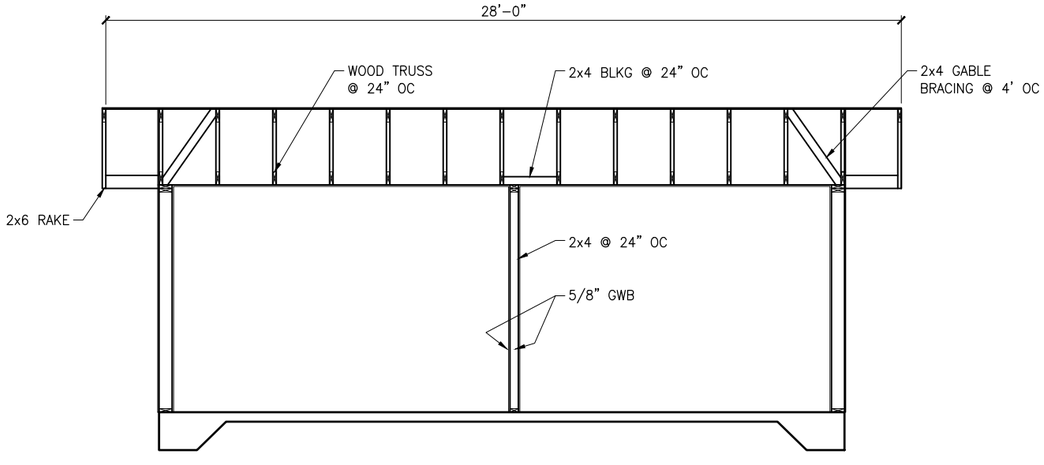
PLAN
NTS



FRONT ELEVATION
NTS



SECTION
NTS



SECTION
NTS

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DESIGNED BY: xxx	STATE OF ALASKA DEPARTMENT OF TRANSPORTATION & PUBLIC FACILITIES SOUTHEAST REGION
CHECKED BY: STAFF	**MARINE** **SAND POINT** **DOCK REPLACEMENT** **PROJECT #SFHWY00006**
DRAWN BY: STAFF	**GENERATOR BUILDING**

PATH: 29 E3 GEN BLDG.DWG
TAB: 29 Tuesday, August 09, 2016 6:35:42 PM ALEJANDRO MENDOZA

REVISIONS NO.	DATE	DESCRIPTION	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			SFHWY00006	2016	29	29

State of Alaska

Department of Transportation and Public Facilities Southcoast Region

SAND POINT DOCK REPLACEMENT
PROJECT NO. SFHWY00006

GENERAL NOTES:

1. ALL WORK IS NEW UNLESS OTHERWISE NOTED.
2. PERFORM ALL WORK PER 2014 NATIONAL ELECTRICAL CODE AND OTHER APPLICABLE NATIONAL, STATE, AND LOCAL CODES AND STANDARDS.
3. ALL PART NUMBERS ARE GIVEN AS A GUIDE TO WHAT MATERIAL IS BEING SPECIFIED. THEY ARE BASED UPON INFORMATION AVAILABLE DURING DESIGN AND MAY NOT BE ACCURATE. VERIFY ALL PART NUMBERS DURING BIDDING AND CHANGE AS REQUIRED TO CONFORM TO DRAWINGS AND SPECIFICATIONS. THE DRAWINGS SHALL NOT BE USED AS A BILL OF MATERIALS.
4. PROVIDE ANTI-SIEZE COMPOUND ON ALL WIRING TERMINATIONS. PROVIDE NM SPACERS TO ISOLATE DIFFERENT MATERIAL TYPES.
5. MOUNT ALL OF THE OUTDOOR ELECTRICAL EQUIPMENT IN THE LOCATIONS SHOWN ON THE CIVIL DRAWINGS. LOCATIONS SHOWN ON THE ELECTRICAL DRAWINGS ARE APPROXIMATE.
6. FIELD TREAT ALL HOT DIPPED GALVANIZED MATERIALS THAT ARE CUT, DRILLED, SCRATCHED OR DAMAGED. SEE CIVIL FOR FIELD TREATMENT.
7. ALL CONDUCTORS SHALL BE COPPER, ALL INSULATION SHALL BE 600V RATED. TYPE XHHW FOR CONDUCTORS NOT IN A CABLE. ALL CABLES SHALL BE THE TYPE SPECIFIED, NO SUBSTITUTIONS.
8. TREAT ALL EXPOSED THREADS WITH BRAKE CLEANER, THEN COAT WITH MARINE TRAILER WHEEL BEARING GREASE BEFORE APPLYING A STAINLESS STEEL WASHER AND NUT.
9. OUTDOORS, USE 316 STAINLESS STEEL BOLTS, WASHERS, ETC. TO MOUNT ELECTRICAL EQUIPMENT AND STRUT CHANNEL. ALL FASTENERS AND OTHER EXPOSED HARDWARE SHALL BE 316 STAINLESS STEEL.
10. SEAL ALL PENETRATIONS IN ELECTRICAL EQUIPMENT WITH UL LISTED HARDWARE FOR SUCH USE. USE RUBBER OR SILICONE WASHERS IN ADDITION TO STAINLESS STEEL WASHERS.
11. USE 316 STAINLESS STEEL STRUT CHANNEL (UNISTRUT) TO SUPPORT CABLES, PANELS, CONTACTORS, AND ALL OTHER ELECTRICAL EQUIPMENT. TRIM STRUT CHANNEL 1/4" SHORT OF EDGE OF EQUIPMENT AND POSTS. SAND END OF STRUT CHANNEL SMOOTH. USE CUSHION STRAPS WHEN SUPPORTING CABLE TO STRUT CHANNEL.
12. THE PANELS, SWITCHBOARD, AND CONTACTORS SHALL BE MADE BY SQUARE D OR APPROVED EQUAL. MANUFACTURERS ARE PROVIDED FOR OTHER EQUIPMENT SHOWN ON FLOOR PLANS AND SITE PLANS. THE DESIGN IS BASED UPON EQUIPMENT BY THESE MANUFACTURERS ALL NECESSARY CHANGES IN MOUNTING DETAILS, MOUNTING LOCATIONS, BUILDING DIMENSIONS, ETC. SHALL BE MADE AT THE CONTRACTOR'S EXPENSE IN ORDER TO ACCOMMODATE APPROVED SUBSTITUTE EQUIPMENT. SUBSTITUTIONS ARE REVIEWED FOR COMPLIANCE WITH CONTRACT DOCUMENTS DURING THE SUBMITTAL PROCESS THAT OCCURS AFTER CONTRACT AWARD. SUBSTITUTIONS MAY NOT BE APPROVED.
13. PROVIDE OXIDE INHIBITING COMPOUND ON ALL ELECTRICAL CONNECTIONS. BURNDY PENTROX TYPE A OR E AS REQUIRED.
14. ALL LUGS AND ELECTRICAL TERMINALS SHALL BE COPPER OR TIN PLATED HIGH CONDUCTIVE ALUMINUM.
15. ALL EXPOSED CONDUIT SHALL BE GRS.

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INDEX	
SHEET NO.	SHEET TITLE
E01	TITLE, LEGEND AND GENERAL NOTES
E02	SITE PLAN
E03	SINGLE LINE DIAGRAM
E04	GENERATOR BUILDING FLOOR PLANS
E05	GENERATOR BUILDING ELEVATIONS
E06	EQUIPMENT LIST
E07	GENERATOR SCHEMATICS
E08	DETAILS
E09	LIGHT POLE DETAIL
E10	HANDHOLE AND TRENCH DETAILS

LEGEND

▽	GROUND		WALL MOUNT LUMINAIRE	DIST.	DISTRIBUTION	PWR	POWER
G	GENERATOR		POLE MOUNT LUMINAIRE	DPST	DOUBLE POLE, SINGLE THROW	REC	RECEPTACLE
S	SINGLE POLE SWITCH		FLUORESCENT LUMINAIRE	ELEC	ELECTRIC OR ELECTRICAL	SS	STAINLESS STEEL
M	ELECTRIC MOTOR			EBM	EXTENDED BATTERY MODULE	TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSOR
J	JUNCTION BOX		HAND OFF AUTO SWITCH	EXTG	EXISTING	TYP	TYPICAL
X-#	HOME RUN (PANEL-CKT)			GALV.	GALVANIZED	UGE	UNDERGROUND ELECTRICAL UTILITY
	CONDUIT WITH CONDUCTORS. SEE PLANS FOR SIZE AND QUANTITY.			GFI	GROUND FAULT INTERRUPTER	WP	WEATHER PROOF
	FLEXIBLE CONDUIT	AFF	ABOVE FINISHED FLOOR	GRS	GALVANIZED RIGID STEEL	J-BOX	JUNCTION BOX
		AFG	ABOVE FINISHED GRADE	GND	GROUND	KA	KILOAMPERES
	DISCONNECT	AUX	AUXILIARY	HOA	HAND OFF AUTO	KAIC	KILO-AMPERE INTERRUPTING CAPACITY
20/3	CIRCUIT BREAKER (AMPS/POLES)	AWG	AMERICAN WIRE GUAGE	HP	HORSE POWER	KVA	KILOVOLTAMPERES
	CONTACTOR	BLDG	BUILDING	MIN	MINIMUM	KW	KILOWATT
PE	PHOTO ELECTRIC	C/B	CIRCUIT BREAKER	NEC	NATIONAL ELEC CODE	LFNC	LIQUID TIGHT NON-METALLIC CONDUIT
R	RELAY	CKT	CIRCUIT	N.O.	NORMALLY OPEN		
LC	LIGHTING CONTACTOR	C	CONDUIT	NO.	NUMBER	LTG	LIGHTING
		CTRL	CONTROL	PF	POWER FACTOR	MAINT	MAINTENANCE

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DESIGNED BY: MGM
CHECKED BY: MGM
DRAWN BY: LDS

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION
& PUBLIC FACILITIES
SOUTHEAST REGION

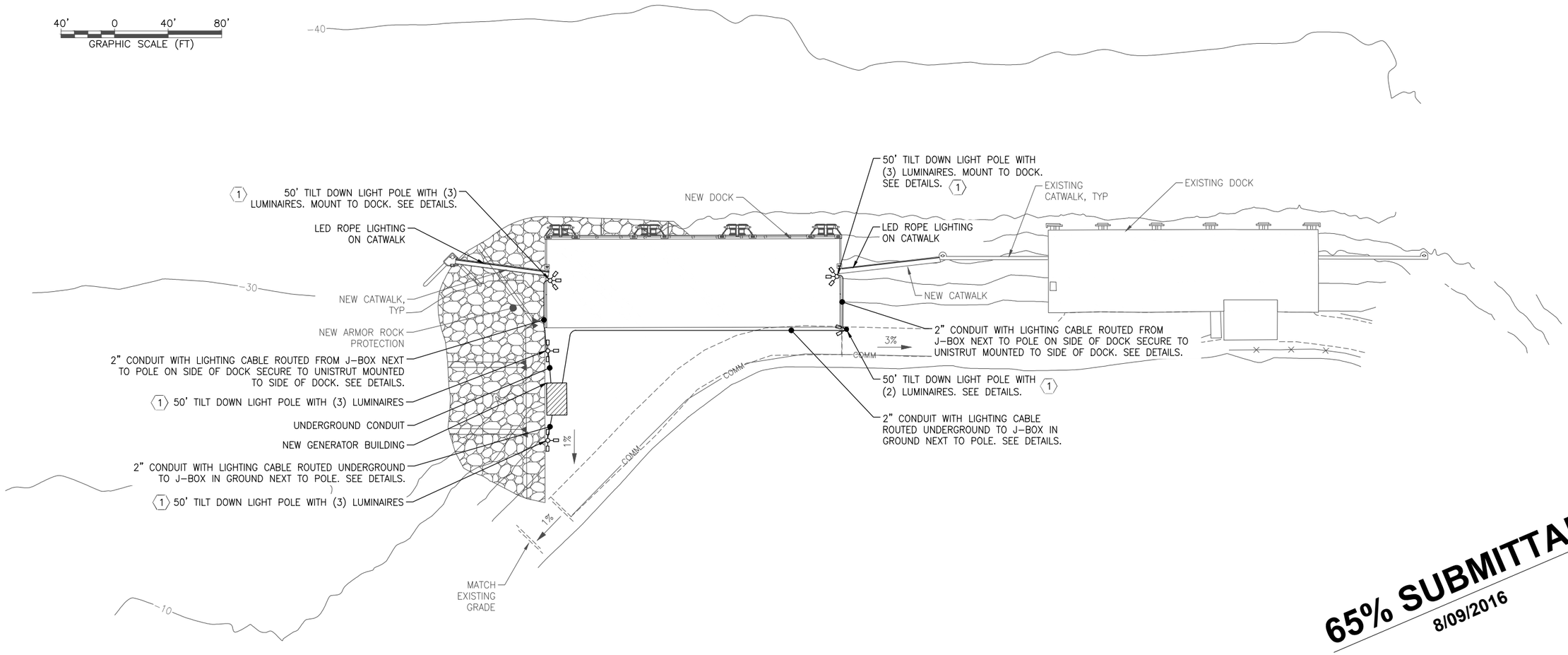
MARINE
SAND POINT
DOCK REPLACEMENT
PROJECT #SFHWY00006

TITLE, LEGEND, AND GENERAL NOTES

PATH: 30 E1 TITLE, LEGEND AND GENERAL NOTES.DWG
TAB: E1 Tuesday, August 09, 2016 6:35:49 PM ALEJANDRO MENDOZA

REVISIONS NO.	DATE	DESCRIPTION	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			SFHWY00006	2016	E1	10

40' 0 40' 80'
GRAPHIC SCALE (FT)



1 SITE PLAN - ELECTRICAL

NOTE:

1 POLE MOUNTED LUMINAIRE SHALL CONSIST OF 150 LED LAMPS, 385W, 800MA 120-277V DRIVER, TYPE 4 DISTRIBUTION, 4000K COLOR TEMPERATURE, 34000 INITIAL LUMENS, BLACK FINISH, AND UPSWEPT ARM SUPPORT. PROVIDE PHOTOCELL RECEPTACLE ON POLE NEXT TO NEW GENERATOR BUILDING. KIM LIGHTING 3STARX2544K80UVBLUSA25-7. PROVIDE (5) FLAT BLACK 50' TILT DOWN POLES WITH LUMINAIRE CONFIGURATIONS AS SHOWN. (2) POLES WITH LUMINAIRES AT 0°, 45°, AND 90°. (2) POLES WITH LUMINAIRES AT 0°, 90°, AND 180°. (1) POLE WITH LUMINAIRES AT 0° AND 45°. VERIFY AND MODIFY THE MANUFACTURER PART NUMBER TO PROVIDE LUMINAIRES WITH ALL THE FEATURES DESCRIBED.

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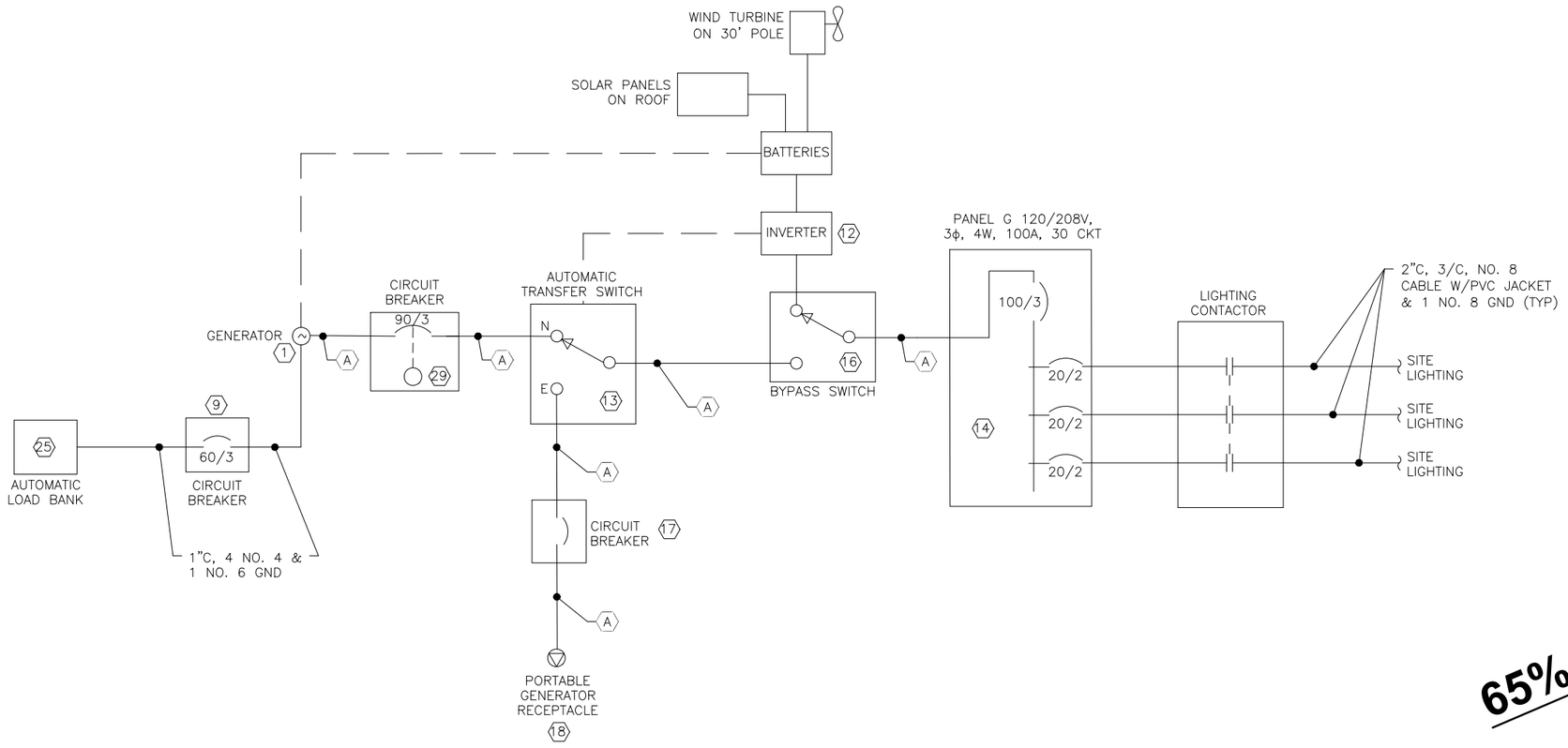
DESIGNED BY: MGM	STATE OF ALASKA DEPARTMENT OF TRANSPORTATION & PUBLIC FACILITIES SOUTHEAST REGION
CHECKED BY: MGM	**MARINE SAND POINT DOCK REPLACEMENT PROJECT #SFHWY00006**
DRAWN BY: LDS	**SITE PLAN**
PATH: 31 E02 SITE PLAN.DWG	
TAB: E02 Tuesday, August 09, 2016 6:39:00 PM ALEJANDRO MENDOZA	

REVISIONS NO.	DATE	DESCRIPTION	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			SFHWY00006	2016	E02	10

NOTES:

1. SOME EQUIPMENT ON THIS SHEET HAS A KEYNOTE NUMBER ASSOCIATED WITH IT. THE KEYNOTE NUMBER IS SHOWN INSIDE A HEXAGON (⟨#⟩). SEE THE EQUIPMENT LIST LOCATED ON SHEET E06 FOR A DETAILED DESCRIPTION OF THE EQUIPMENT.
2. KEYNOTES WITH AN ALPHA CHARACTER ARE DESCRIBED IN THE SHEET NOTES ON THIS SHEET.



1 SINGLE LINE DIAGRAM

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SHEET NOTE:

⟨A⟩ 1-1/2"C, 4 NO. 2 & 1 NO. 6 GND

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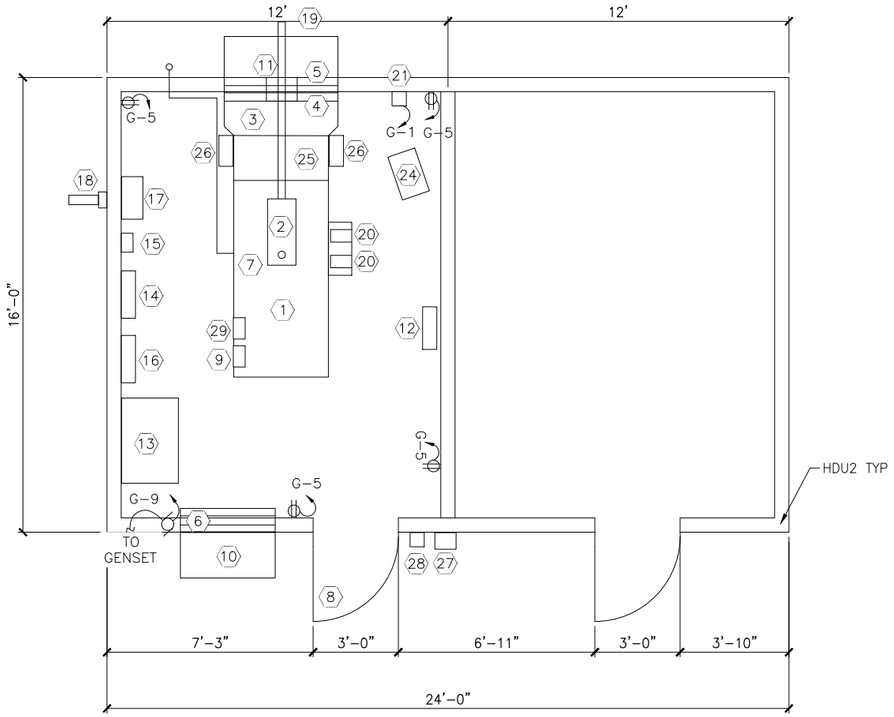
CHECKED BY: MGM	**MARINE** **SAND POINT** **DOCK REPLACEMENT** **PROJECT #SFHWY00006**
DRAWN BY: LDS	**SINGLE LINE DIAGRAM**

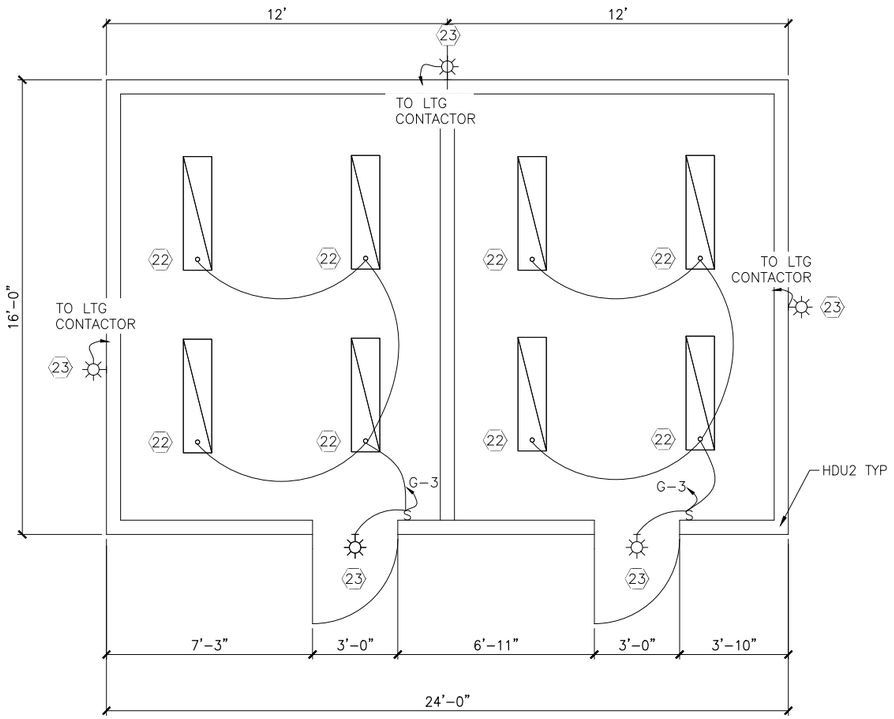
PATH: 32 E03 SLD.DWG
TAB: E03 Tuesday, August 09, 2016 6:36:16 PM ALEJANDRO MENDOZA

REVISIONS NO.	DATE	DESCRIPTION	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			SFHWY00006	2016	E03	10



1 GENERATOR BUILDING - EQUIPMENT FLOOR PLAN

9" 18" 30" 5'



1 GENERATOR BUILDING - LIGHTING FLOOR PLAN

9" 18" 30" 5'

NOTE:

SOME EQUIPMENT ON THIS SHEET HAS A KEYNOTE NUMBER ASSOCIATED WITH IT. THE KEYNOTE NUMBER IS SHOWN INSIDE A HEXAGON (#). SEE THE EQUIPMENT LIST LOCATED ON SHEET E06 FOR A DETAILED DESCRIPTION OF THE EQUIPMENT.

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CHECKED BY: MGM	**MARINE SAND POINT DOCK REPLACEMENT PROJECT #SFHWY00006**
DRAWN BY: LDS	**GENERATOR BUILDING FLOOR PLANS**
PATH: 33 E04 GEN BLDG.DWG	
TAB: E04 Tuesday, August 09, 2016 6:36:31 PM	ALEJANDRO MENDOZA

REVISIONS NO.	DATE	DESCRIPTION	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			SFHWY00006	2016	E04	10

THIS SHEET WILL SHOW BUILDING ELEVATIONS ON PS&E SET

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STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION
& PUBLIC FACILITIES
SOUTHEAST REGION

MARINE
SAND POINT
DOCK REPLACEMENT
PROJECT #SFHWY00006

GENERATOR BUILDING ELEVATIONS

PATH: 34 E5 GENERATOR BUILDING ELEVATIONS.DWG
TAB: E5 Tuesday, August 09, 2016 6:36:42 PM ALEJANDRO MENDOZA

REVISIONS NO.	DATE	DESCRIPTION

PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
SFHWY00006	2016	E5	10

EQUIPMENT LIST

(APPLIES TO EQUIPMENT SHOWN ON SHEETS E03–E05, E07)

1. GENERATOR: 60 KW AT 0.8PF, 277/480V, 3ø, 4 WIRE, TIER 3. PROVIDE WITH 40 KW AUTOMATIC LOAD BANK W/ 5KW LOAD STEPS. PROVIDE THE GENERATOR WITH THREE CUSTOMER CONFIGURABLE RELAYS TO CONTROL THE LOAD BANK AFTER THE GENERATOR HAS RUN FOR 3 MINUTES AND DURING THE COOL DOWN CYCLE. MOUNT LOAD BANK CIRCUIT BREAKER NEXT TO GENERATOR CIRCUIT BREAKER ON THE SIDE OF THE GENERATOR. PROGRAM THE LOAD BANK TO OPERATE WHENEVER GENERATOR IS RUNNING EXCEPT DURING COOL DOWN. RUN CONTROL CONDUCTORS TO GENERATOR RELAYS TO DUMP LOAD BANK DURING COOL DOWN. PROVIDE CTS IN AUTOMATIC TRANSFER SWITCH (ATS) AND ALL NECESSARY CONTROL WIRING TO ATS AND GENERATOR TO START THE LOAD BANK AUTOMATICALLY WHEN THE GENERATOR HAS BEEN RUNNING FOR 3 MINUTES. PROVIDE AUTOMATIC LOAD LEVELING TO MAINTAIN A 35 KW LOAD ON THE GENERATOR WHEN THE LOAD BANK IS ON. DISCONNECT THE LOAD BANK FROM THE GENERATOR DURING THE GENERATOR COOL DOWN. PROVIDE 15 MINUTES MINIMUM OF GENERATOR COOL DOWN INCLUDING COOL DOWN OF LOAD BANK ELEMENTS. PROVIDE ALL CONDUIT, WIRING, AND PROGRAMMING REQUIRED. MOUNT ON (4 MIN) ISOLATION PADS. BOLT TO PAD WITH EARTHQUAKE ANGLE STOPS. CUMMINS GENSET (FOOTPRINT IS 40"W X 83"L) DSFAD SERIES.
2. GENSET SILENCER AND EXHAUST PIPE. SIZE PIPE AND SILENCER PER GENSET MANUFACTURER'S REQUIREMENTS. PROVIDE RESIDENTIAL GRADE SILENCER. SEE DETAIL SHEET E08.
3. EXHAUST COOLING AIR DUCT. MOUNT ONE END TO ENGINE RADIATOR. MOUNT THE OTHER END TO THE BACKDRAFT DAMPER AND FIXED LOUVER.
4. BACKDRAFT EXHAUST DAMPER. 48"H X 48"W. MOUNT BASE AT 30". SEE DETAIL SHEET E08. PROVIDE ALUMINUM BACK DRAFT DAMPER BLADES IN AN ALUMINUM FRAME WITH SELF–LUBRICATING CELCON BEARINGS. TAMCO SERIES 7000 OR EQUAL.
5. FIXED BLADE EXHAUST LOUVER. 48"H X 48"W. TAMCO SERIES 3000.
6. MOTORIZED INTAKE LOUVER 40"H X 40"W. PROVIDE WITH EXTRUDED ALUMINUM INSULATED BLADES IN AN ALUMINUM FRAME. THE LOUVER SHALL HAVE A MINIMUM R VALUE OF 2.25. TAMCO SERIES 9000 WITH SEVERE COLD OPTION. THE LOUVER SEALS SHALL NOT STICK DURING FREEZING CONDITIONS. PROVIDE WITH MOTORIZED ACTUATOR. PROVIDE A 120V MOTOR TO OPERATE THE LOUVER. THE LOUVER SHALL BE SPRING LOADED TO BE OPENED WITH LOSS OF POWER. PROVIDE A NORMALLY CLOSED CONTACT AND INTERPOSING RELAY IF NECESSARY TO POWER THE LOUVER CLOSED WHEN THE GENERATOR IS NOT RUNNING. PROVIDE A NORMALLY CLOSED CONTACT IN THE GENERATOR CONTROL PANEL.
7. SUBBASE FUEL TANK WITH SPILL CONTAINMENT AND DRAIN VALVE. (SIZE FOR 24 HOURS AT FULL LOAD) PROVIDE WITH TANK QUANTITY INDICATOR, LOW FUEL ALARM CONTACTS, AND VENT PIPING. VENT TANK TO OUTSIDE AT 8' AFG. USE BLACK IRON PIPE FOR VENT PIPING. SIZE PER MANUFACTURER RECOMMENDATIONS. PAINT WITH RUST–PROOF PAINT. ROUTE ACROSS FLOOR ON UNISTRUT. FUEL TANK SHALL BE MANUFACTURED BY GENSET MANUFACTURER FOR THE MODEL OF GENSET PROVIDED.
8. FIBERGLASS SOLID CORE INSULATED DOOR WITH FIBERGLASS FRAME AND STAINLESS STEEL THRESHOLD. PROVIDE STAINLESS STEEL HEADER. CUT OPENING IN BUILDING AS REQUIRED TO INSTALL DOOR. DOOR HARDWARE SHALL BE SCHLAGE STAINLESS STEEL COMMERCIAL RATING. SEAL AND INSULATE AROUND DOOR FRAME.
9. LOAD BANK CIRCUIT BREAKER. MOLDED CASE CIRCUIT BREAKER IN NEMA 1 ENCLOSURE, 60 AMPS, 3 POLE AT 480V. COORDINATE SIZE WITH LOAD BANK MANUFACTURER. MOUNT ON GENSET NEXT TO GENSET MAIN CIRCUIT BREAKER.
10. INTAKE AIR SHROUD WITH BIRD SCREEN. SEE DETAIL SHEET E08.
11. EXHAUST THIMBLE. SEE DETAIL SHEET E08.
12. INVERTER.
13. AUTOMATIC TRANSFER SWITCH, MOUNT TOP AT 72" AFG, 225 AMP ONAN 0TPC SERIES.
14. PANEL G, MOUNT TOP AT 72" AFG, SQUARE D NQ SERIES. 120/208V, 3ϕ, 4W, 100A, 30 CKT W/ 100A MAIN.
15. TRANSIENT VOLTAGE SURGE SUPPRESSION DEVICE (TVSS). MOUNT TOP AT 60" AFF. 80KA SURGE CURRENT (8x20ms) PER PHASE, PROTECTION MODES: L–N, L–L, N–G, L–G. LIEBERT AIIY111RKE. PROVIDE LED INDICATORS AND ALARM CONTROLS.
16. 120V BYPASS SWITCH.
17. PORTABLE GENERATOR CIRCUIT BREAKER. MOUNT AT 48" AFF. MOLDED CASE CIRCUIT BREAKER IN NEMA 1 ENCLOSURE, 100A, 3 POLE AT 480V. SQUARE D JDL36200 CIRCUIT BREAKER IN J250DS ENCLOSURE OR EQUAL.
18. STYLE 2, PORTABLE GENERATOR RECEPTACLE. CROUSE HINDS AREA204226S22 WITH BACK BOX, ANGLE ADAPTER, AND REVERSE SERVICE INSULATORS. MOUNT AT 48" AFG.
19. EXHAUST AIR SHROUD, SEE SHEET E08.
20. GENSET BATTERY. 12V. PROVIDE SIZE TO CRANK ENGINE FOR 30 MINUTES CONTINUOUSLY.
21. 12V, 10A, AUTOMATIC BATTERY CHARGER.
22. 4' LENS WRAPAROUND LED 4700 LUMENS, 3500K, COLUMBIA LAW435MLEU(ELL14) PROVIDE WITH EM BALLAST WHERE SHOWN (TYP–4)
23. LED COMPACT WALL PACK TYPE IV, 330 LUMENS, 4200K, GRAY WITH PHOTOCELL HUBBELL LNC218LU4K43PC(120) MOUNT ABOVE DOOR.
24. CEILING MOUNT UNIT HEATER, 480V, 3ø, 3.7 KW, BUILT–IN TWO POLE THERMOSTAT WITH THERMAL CUTOUT. AIR FLOW CAN BE ADJUSTED DOWNWARD. QMARK MUH SERIES WITH OPTIONS MT–2 AND MMB–5.
25. RADIATOR MOUNTED 40 KW AUTOMATIC LOAD BANK. PROVIDE WITH AUTOMATIC LOAD LEVELING. PROVIDE WITH 5 KW STEPS. SIMPLEX LBD–40A OR EQUAL. MOUNT IN EXHAUST DUCT. PROGRAM TO MAINTAIN 35KW ON GENERATOR. DISCONNECT LOAD DURING GENERATOR COOL DOWN CYCLE.
26. AUTOMATIC LOAD BANK CONTROL PANEL. SIMPLEX LBD SERIES. COORDINATE WITH MANUFACTURER TO PROVIDE ONE PANEL ON SIDE SHOWN FOR ADEQUATE WORKING CLEARANCE.
27. GENERATOR EMERGENCY STOP. ACTIVATES GENSET MAIN C/B SHUNT TRIP. MOUNT AT 48" AFG.
28. REMOTE GENERATOR ALARM STROBE LIGHT AT 7' AFG. PROVIDE POWER TO STROBE LIGHT FROM PANEL G WITH AN INTERPOSING RELAY IN A NEMA 1 ENCLOSURE ON WALL. CONNECT TO GENERATOR CONTROL PANEL TO ENERGIZE LIGHT WITH GENERATOR ALARM.
29. GENSET MAIN CIRCUIT BREAKER WITH SHUNT TRIP MECHANISM: MOLDED CASE CIRCUIT BREAKER IN NEMA 1 ENCLOSURE, 90 AMPS, 3 POLE AT 480V. COORDINATE SIZE WITH MANUFACTURER. ACTIVATE THE SHUNT TRIP WITH A REMOTE MOUNTED, RED MUSHROOM HEAD PUSH BUTTON INSIDE A NEMA 4X ENCLOSURE WITH A HINGED CLEAR COVER AND A PADLOCK HASP. MOUNT THE PUSH BUTTON IN A NEMA 3R JUNCTION BOX INSIDE THE NEMA 4X ENCLOSURE SO THAT THERE IS NO ACCESS TO THE PUSH BUTTON WITHOUT REMOVING A PADLOCK (OWNER SUPPLIED) AND OPENING THE COVER. THE PUSH BUTTON SHALL BE A NEMA 4X, 30 MM, OIL–TIGHT/WATERTIGHT/CORROSION RESISTANT, ALLEN BRADLEY BULLETON 800 SERIES. MOUNT THE PUSH BUTTON ON THE OUTSIDE OF THE BUILDING WHERE SHOWN.

NOTES:

1. ALL EQUIPMENT SHALL BE SURFACE MOUNTED. ALL CONDUIT SHALL BE SURFACE MOUNTED.
2. THE GENERATOR BUILDING LAYOUT IS VERY TIGHT. ALL NEC CLEARANCE REQUIREMENTS ARE MET WITH THE EQUIPMENT SHOWN. IF SUBSTITUTIONS ARE MADE FOR THE EQUIPMENT SHOWN, VERIFY THAT THE NEW EQUIPMENT SIZE WILL ALLOW COMPLIANCE WITH NEC CLEARANCE REQUIREMENTS.
3. ALL ENCLOSURES AND JUNCTION BOXES ON THE BUILDING EXTERIOR SHALL BE NEMA 4X STAINLESS STEEL UNLESS OTHERWISE NOTED.

PANEL G

SIZE	VOLTS, PHASE	MOUNTING	MAIN	LOCATION
100A	120/208V, 3ø, 4W	SURFACE	50A MAIN	GEN BLDG

CKT NO.	DESCRIPTION	C/B SIZE	KVA CKT	KVA Aø	KVA Bø	KVA Cø	KVA CKT	C/B SIZE	DESCRIPTION	CKT NO.
1	BATTERY CHARGER	20/1	0.2	0.2			0.0	30/2	SPARE	2
3	LIGHTING		0.4		0.4		0.0	——	——	4
5	RECEPTACLES		0.8			0.9	0.1	20/1	FUEL TANK & GEN. CONTROLS	6
7	GEN. PANEL LIGHT		0.1	0.2			0.1	20/1	WATER JACKET HEATER	8
9	INTAKE LOUVER		0.1		0.1				SPACE	10
11	SPARE									12
13										14
15										16
17										18
TOTAL CONNECTED LOAD = 1.8 KVA/5 AMPS				0.4	0.5	0.9				

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CHECKED BY: MGM
DRAWN BY: LDS

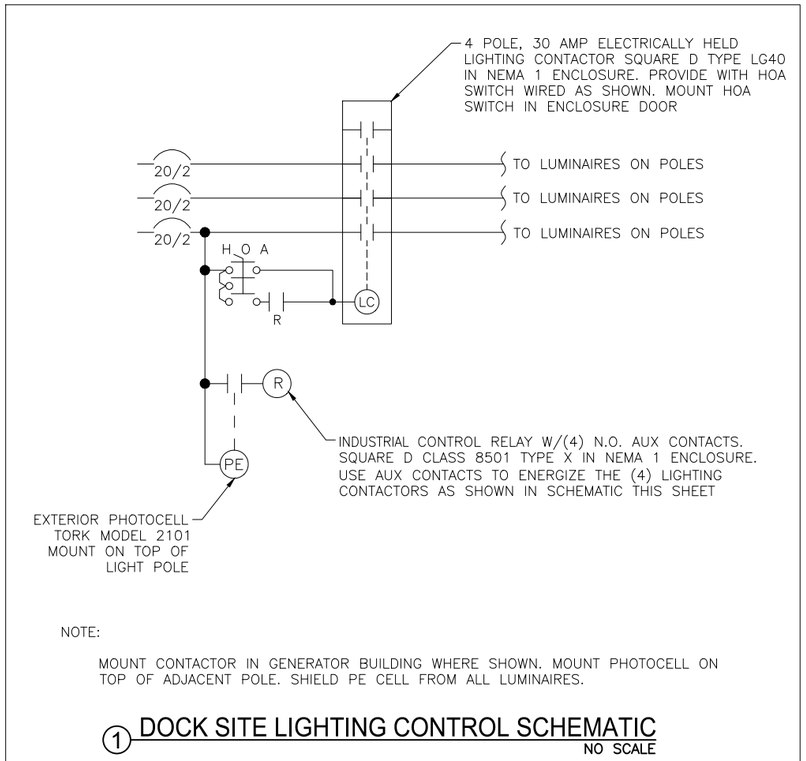
STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION
& PUBLIC FACILITIES
SOUTHEAST REGION

MARINE
SAND POINT
DOCK REPLACEMENT
PROJECT #SFHWY00006

EQUIPMENT LIST AND PANEL G SCHEDULE

PATH: 35 E06 EQUIPMENT LIST.DWG
TAB: E06 Tuesday, August 09, 2016 6:36:54 PM ALEJANDRO MENDOZA

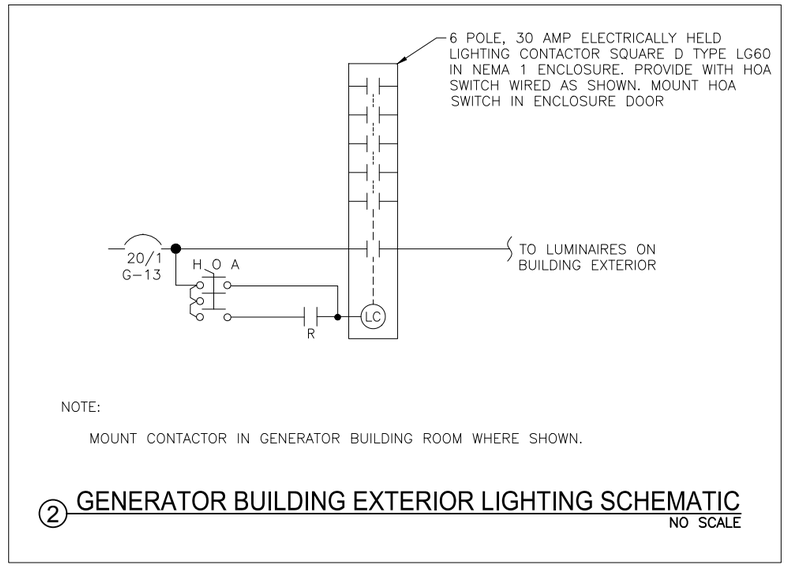
REVISIONS NO.	DATE	DESCRIPTION	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			SFHWY00006	2016	E06	10



NOTE:

MOUNT CONTACTOR IN GENERATOR BUILDING WHERE SHOWN. MOUNT PHOTOCELL ON TOP OF ADJACENT POLE. SHIELD PE CELL FROM ALL LUMINAIRES.

① DOCK SITE LIGHTING CONTROL SCHEMATIC
NO SCALE



NOTE:

MOUNT CONTACTOR IN GENERATOR BUILDING ROOM WHERE SHOWN.

② GENERATOR BUILDING EXTERIOR LIGHTING SCHEMATIC
NO SCALE

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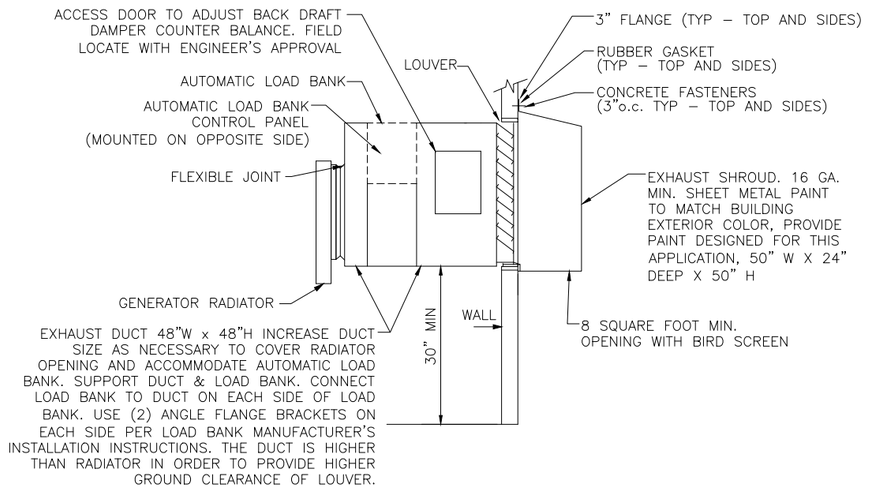
CHECKED BY: MGM	**MARINE** **SAND POINT** **DOCK REPLACEMENT** **PROJECT #SFHWY00006**
DRAWN BY: LDS	**GENERATOR SCHEMATICS**

PATH: 37 E08 GENERATOR SCHEMATICS.DWG
TAB: E07 Tuesday, August 09, 2016 6:37:05 PM ALEJANDRO MENDOZA

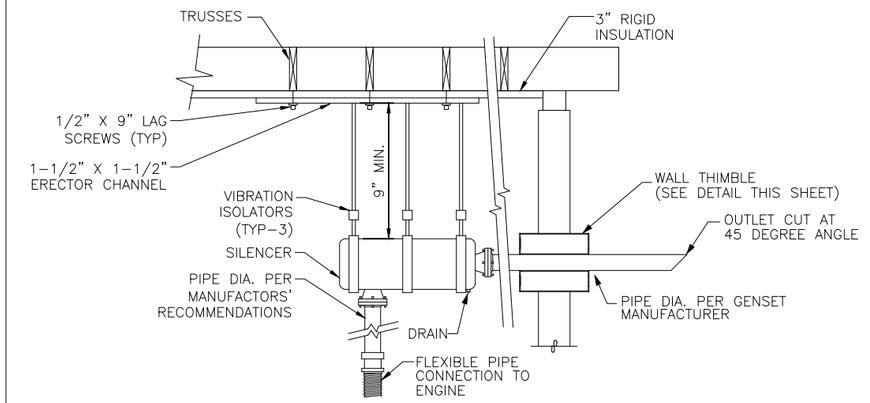
REVISIONS NO.	DATE	DESCRIPTION	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			SFHWY00006	2016	E07	10



NOTES:

1. MODIFY WIDTH OF DUCT BETWEEN RADIATOR AND LOAD BANK AS REQUIRED TO PROVIDE PROPER TRANSITION AND MOUNTING OF LOAD BANK. PROVIDE TRANSITION FROM LOAD BANK TO DUCT ON LOUVER SIDE OF LOAD BANK AS REQUIRED. DUCT WIDTH AT LOUVER SHALL BE 48" WIDE.
2. PROVIDE STRUCTURE BETWEEN DUCT/LOAD BANK AND FLOOR AS REQUIRED TO SUPPORT DUCT AND LOAD BANK.

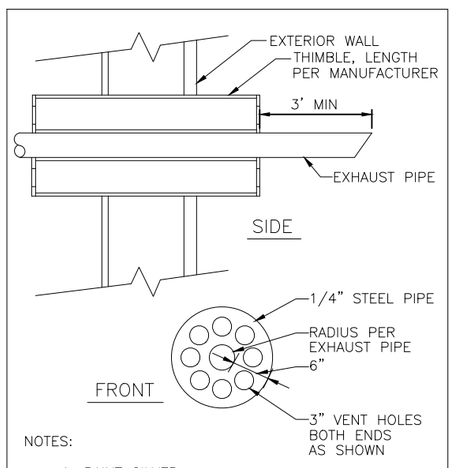
① EXHAUST LOUVER AND SHROUD DETAIL
NO SCALE



NOTE:

PROVIDE 2" MINIMUM INSULATION WITH JACKET OVER MUFFLER AND EXHAUST PIPES FROM FLEX PIPE TO WALL THIMBLE. PROVIDE CALCIUM SILICATE WITH ALUMINUM JACKET.

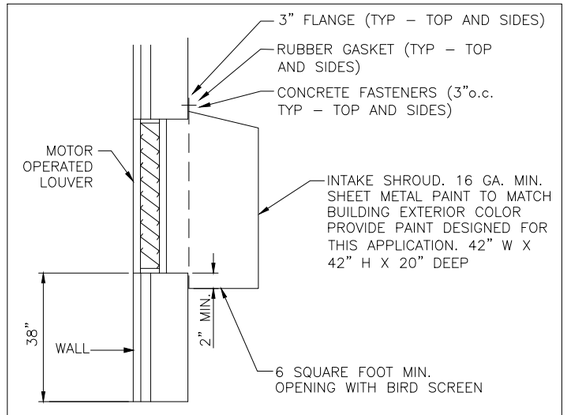
② GENSET SILENCER DETAIL
NO SCALE



NOTES:

1. PAINT SILVER.
2. ADD BUG SCREEN OVER THIMBLE.

③ EXHAUST THIMBLE DETAIL
NO SCALE



④ INTAKE LOUVER AND SHROUD DETAIL
NO SCALE

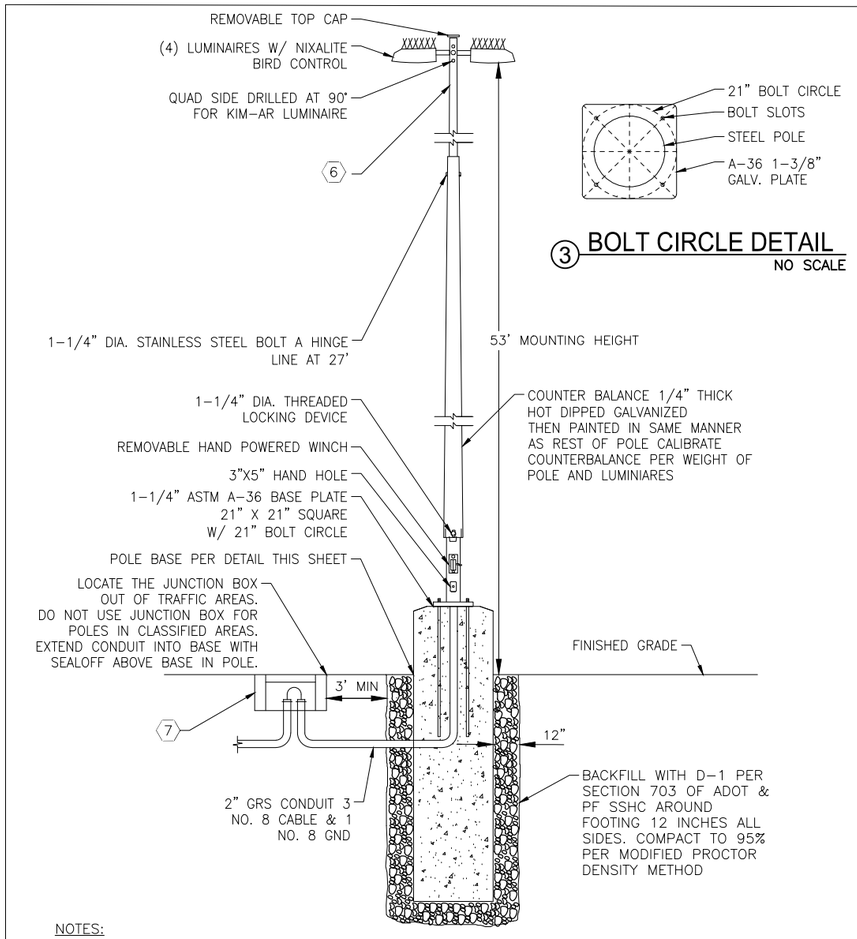
65% SUBMITTAL
8/09/2016

DO NOT SCALE FROM THESE DRAWINGS USE DIMENSIONS

DESIGNED BY: MGM	STATE OF ALASKA DEPARTMENT OF TRANSPORTATION & PUBLIC FACILITIES SOUTHEAST REGION
CHECKED BY: MGM	**MARINE** **SAND POINT** **DOCK REPLACEMENT** **PROJECT #SFHWY00006**
DRAWN BY: LDS	**DETAILS**

PATH: 36 E07 GENERATOR DETAILS.DWG
TAB: E08 Tuesday, August 09, 2016 6:37:17 PM ALEJANDRO MENDOZA

REVISIONS NO.	DATE	DESCRIPTION	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			SFHWY00006	2016	E08	10



③ BOLT CIRCLE DETAIL
NO SCALE

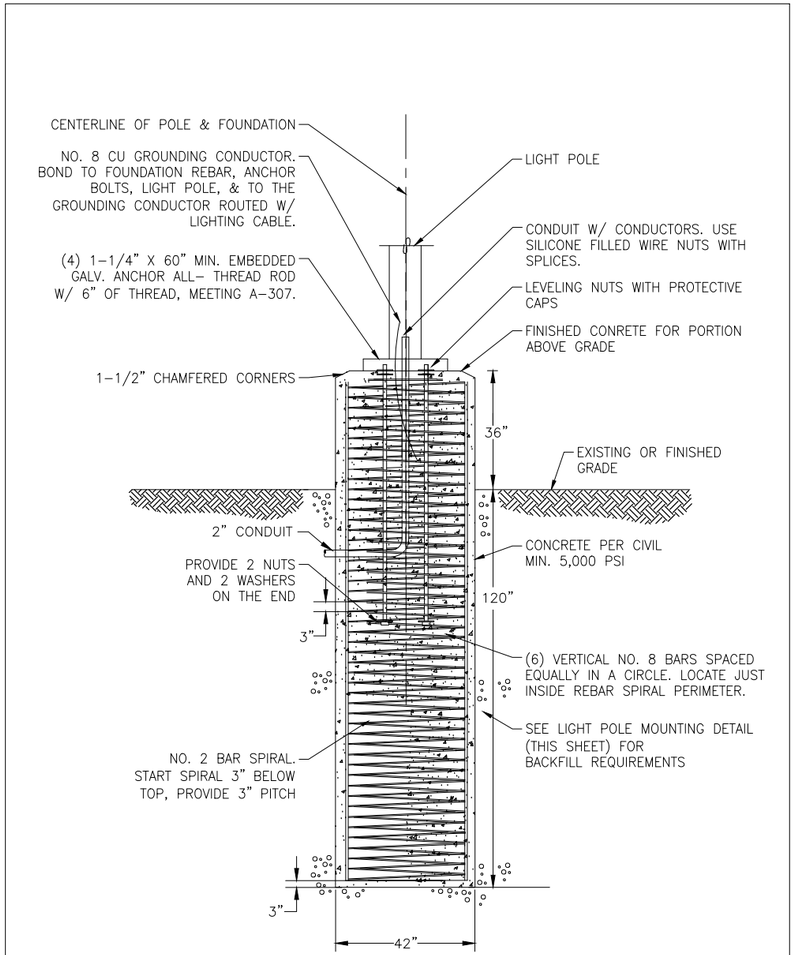
NOTES:

1. ALL SPLICES SHALL BE IN BASE OF POLE.
2. PROVIDE GROUNDING BUSHINGS ON CONDUIT.
3. PROVIDE FUSE KITS IN EACH POLE BASE.
4. SIZE POLE FOR 130 MPH SUSTAINED WINDS WITH GUSTS TO 160 MPH. POLE DIMENSIONS SHOWN ARE THE MINIMUM.
5. THE LUMINAIRE SHALL BE AS SHOWN ON PLANS.

6. SQUARE TAPERED STEEL TUBE, ASTM A-36 1/4" WALL LUMINAIRES MOUNTED DIRECT TO POLE. POLE SHALL HAVE A 21" BOLT CIRCLE, POLE SHALL BE HOT DIPPED GALVANIZED THEN PAINTED FLAT BLACK W/ TNEMEC PAINTING SYSTEM FOR PAINTING OVER GALVANIZED STEEL. THIS PAINT IS USED TO PREVENT GLARE TO MINIMIZE IMPACT ON AREA RESIDENTS.

7. 16,000 LB DESIGN LOAD, 16"W X 22"L X 12"D, NOMINAL TRAFFIC RATED HANDHOLE W/ BOLT DOWN STEEL COVER W/ RAISED NON-SKID SURFACE OLD CASTLE B1017 BOX AND B1017-51JH COVER OR EQUAL SEE INSTALLATION DETAILS SHEET E10. LOCATE J-BOX IN LINE WITH CONDUIT FEEDING POLES IT IS SHOWN 90° OFF IN THIS DETAIL FOR CLARITY.

① LIGHT POLE MOUNTING DETAIL
NO SCALE



② LIGHT POLE BASE DETAIL
NO SCALE

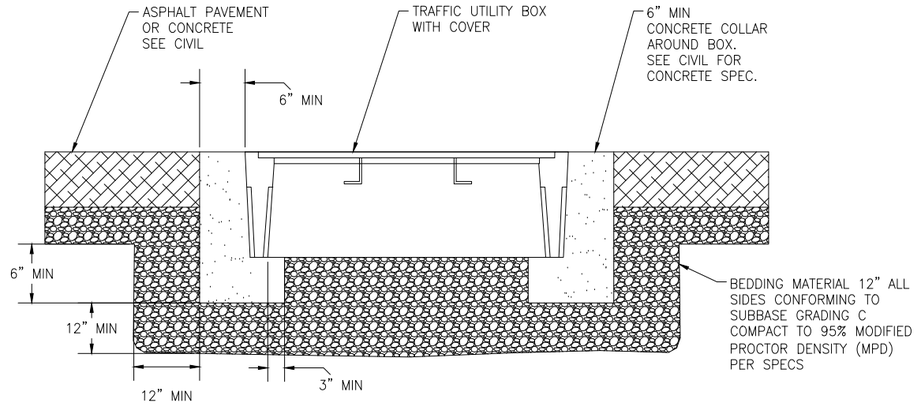
65% SUBMITTAL
8/09/2016

DO NOT SCALE FROM THESE DRAWINGS USE DIMENSIONS

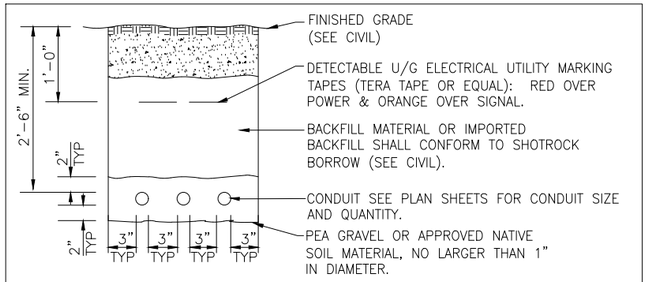
DESIGNED BY: MGM	STATE OF ALASKA DEPARTMENT OF TRANSPORTATION & PUBLIC FACILITIES SOUTHEAST REGION
CHECKED BY: MGM	**MARINE** **SAND POINT** **DOCK REPLACEMENT** **PROJECT #SFHWY00006**
DRAWN BY: LDS	**LIGHT POLE DETAIL**

PATH: 38 E09 LIGHT POLE DETAIL.DWG
TAB: E09 Tuesday, August 09, 2016 6:37:29 PM ALEJANDRO MENDOZA

REVISIONS NO.	DATE	DESCRIPTION	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			SFHWY00006	2016	E09	10



① HANDHOLE DETAIL
NO SCALE



NOTES:

1. ALL DIMENSIONS ARE MINIMUM.
2. THE LOCATION OF ALL EXISTING PIPING, CONDUIT, ETC MAY NOT BE WHERE SHOWN AND MAY NOT BE SHOWN. ALL LOCATIONS THAT ARE SHOWN ARE APPROXIMATE AND SHOULD BE FIELD VERIFIED. OBTAIN UTILITY LOCATES PRIOR TO DIGGING. DIG WITH CAUTION. AVOID WATER, SEWER, DRAINAGE PIPES AND OTHER CONFLICTS.
3. MAINTAIN 12 INCHES MINIMUM SEPARATION (ALL DIRECTIONS) BETWEEN POWER AND OTHER EXISTING CONDUITS, PIPES, ETC.
4. CUT & REPLACE EXISTING ASPHALT, CONCRETE, CONCRETE CURB, GUTTER, SIDEWALK, ETC. AS NECESSARY.
5. ALL TRENCHES SHALL BE 18" WIDE MIN. COMPACT BACKFILL PER CIVIL. TOP 6" OF MATERIAL PER CIVIL.
6. POWER UTILITY CONDUIT SHALL BE BURIED AT A MINIMUM OF 3'.
7. MODIFY CONDUIT BURIAL DEPTH WHERE SHOWN ON DRAWINGS.
8. MAINTAIN 36" MINIMUM LATERAL SEPARATION FROM WATER AND SEWER LINES. MAINTAIN 12" SEPARATION BETWEEN ELECTRICAL UTILITY CONDUITS.

② TRENCH DETAIL (TYP)
NO SCALE

65% SUBMITTAL
8/09/2016

DO NOT SCALE FROM THESE DRAWINGS USE DIMENSIONS

DESIGNED BY: MGM	STATE OF ALASKA DEPARTMENT OF TRANSPORTATION & PUBLIC FACILITIES SOUTHEAST REGION
CHECKED BY: MGM	**MARINE SAND POINT DOCK REPLACEMENT PROJECT #SFHWY00006**
DRAWN BY: LDS	**HANDHOLE AND TRENCH DETAIL**

PATH: 39 E10 TRENCH DETAIL.DWG
TAB: E10 Tuesday, August 09, 2016 6:37:40 PM ALEJANDRO MENDOZA

REVISIONS NO.	DATE	DESCRIPTION	PROJECT DESIGNATION	YEAR	SHEET NO.	TOTAL SHEETS
			SFHWY00006	2016	E10	10

Cost Breakdown Structure (CBS) Register

PND ENGINEERING, INC
161019 - 65prct--Sand Point Public Dock

CBS Position Code	Description	Material Quantity	Unit of Measure	Days (Total)	Total Unit Cost	Total Cost
JOB	**JOB**					
1	**Pile Supported Dock**	13,320.00	SF	1,083.99	$762.58	$10,157,611.45
1.1	Mobilization and Demobilization	1.00	LS	23.00	$1,010,551.27	$1,010,551.27
1.1.1	Mobilization	1.00	LS	15.00	$662,077.17	$662,077.17
1.1.1.1	Yard Mobilization	1.00	LS	10.00	$75,572.11	$75,572.11
1.1.1.2	Mobilization to Site	1.00	LS	5.00	$586,505.06	$586,505.06
1.1.2	Demobilization	1.00	Each	8.00	$348,474.10	$348,474.10
1.1.2.1	Site Demobilization	1.00	LS	5.00	$45,921.31	$45,921.31
1.1.2.2	Demobilization from Site	1.00	LS	3.00	$302,552.79	$302,552.79
1.2	Demolition	1.00	LS	33.75	$289,830.28	$289,830.28
1.2.1	Salvage Existing Rock Revetment	4,500.00	CY	33.75	$64.41	$289,830.28
1.3	Provide and Install Pile Supported Dock	1.00	LS	92.09	$2,766,864.71	$2,766,864.71
1.3.1	Provide and Install Pipe Pile	1.00	LS	42.57	$1,398,105.83	$1,398,105.83
1.3.1.1	Provide Pipe Piles 24" dia	5,070.00	LF	0.00	$137.55	$697,400.00
1.3.1.2	Drive Pipe Piles	52.00	EA	17.33	$5,238.23	$272,387.88
1.3.1.3	CIP Infill	250.00	CY	25.23	$1,713.27	$428,317.95
1.3.1.3.1	Auger/Remove Gravel From Pile	52.00	EA	10.40	$3,142.94	$163,432.73
1.3.1.3.2	Provide and Install Reinforcement	20,000.00	Pound	5.00	$2.97	$59,444.84
1.3.1.3.3	Provide and Place Concrete	250.00	CY	3.33	$622.08	$155,518.89
1.3.1.3.4	Cut Off Piles and Prep For Cap	52.00	EA	6.50	$960.03	$49,921.49
1.3.2	Install Stage 1 Concrete Cap	200.00	CY	8.00	$1,388.83	$277,765.72
1.3.2.1	Provide Precast Concrete Cap	200.00	CY	0.00	$1,045.00	$209,000.00
1.3.2.2	Set Concrete Caps	200.00	CY	8.00	$343.83	$68,765.72
1.3.3	Install Stage 2 Concrete Cap	150.00	CY	18.64	$1,955.03	$293,253.83
1.3.3.1	Install Temporary Falsework and Embeds	1,000.00	SF	4.00	$50.81	$50,811.12
1.3.3.2	Provide and Install Reinforcement	46,000.00	Pound	11.50	$2.97	$136,723.14
1.3.3.3	Provide and Place Concrete	150.00	CY	2.34	$653.37	$98,005.47
1.3.3.4	Strip Forms and Curing	800.00	SF	0.80	$9.64	$7,714.10
1.3.4	Provide and Install Concrete Deck	1.00	LS	22.88	$797,739.32	$797,739.32
1.3.4.1	Provide Precast Concrete Panels	11,800.00	SF	0.00	$46.98	$554,400.00
1.3.4.2	Set Concrete Panels	1.00	LS	5.63	$48,350.90	$48,350.90
1.3.4.3	Provide and Install Formwork	1.00	LS	6.00	$53,974.29	$53,974.29
1.3.4.4	Grout Panels	1.00	LS	11.25	$141,014.13	$141,014.13
1.4	Fender System	4.00	EA	4.00	$201,971.78	$807,887.11
1.4.1	Provide Fender Pin Piles	113,600.00	Pound	0.00	$1.10	$124,960.00
1.4.2	Install Fender Pin Pile	8.00	EA	2.00	$3,928.67	$31,429.37
1.4.3	Provide and Install Fender Unit	4.00	EA	2.00	$162,874.43	$651,497.74
1.5	Dock Appurtenances	1.00	LS	23.55	$635,278.42	$635,278.42
1.5.1	Provide and Install Bullrail	340.00	LF	4.53	$887.15	$301,631.47
1.5.2	Provide and Install Bollards	10.00	EA	3.44	$10,709.79	$107,097.88
1.5.3	Provide and Install Ladders	5.00	Each	5.00	$17,992.72	$89,963.61
1.5.4	Provide and Install Pile Anodes	55.00	EA	10.58	$2,483.37	$136,585.46
1.6	Mooring Dolphin	1.00	EA	9.50	$390,264.11	$390,264.11
1.6.1	Provide and Install Dolphin Piles	3.00	EA	3.00	$30,381.35	$91,144.06
1.6.2	Provide and Install Dolphin Caps	1.00	EA	2.50	$141,723.10	$141,723.10
1.6.3	Provide and Install Access Catwalk	2.00	EA	4.00	$78,698.48	$157,396.96
1.7	Fill and Armor Rock	1.00	LS	28.10	$867,093.03	$867,093.03
1.7.1	Provide and Place Uplands Fill	7,800.00	CY	1.30	$46.02	$358,983.58
1.7.2	Provide and Place A Rock	1,700.00	CY	6.80	$121.73	$206,945.68
1.7.3	Provide and Place B Rock	900.00	CY	3.00	$113.94	$102,549.57
1.7.4	Place Salvaged Class A Rock	3,000.00	CY	12.00	$46.73	$140,198.26
1.7.5	Provide and Place Class B Rock	1,500.00	CY	5.00	$38.94	$58,415.94
1.8	Electrical	1.00	LS	0.00	$620,000.00	$620,000.00
1.8.1	Generator Building	1.00	LS	0.00	$226,000.00	$226,000.00
1.8.2	Site Lighting	1.00	LS	0.00	$335,000.00	$335,000.00
1.8.3	Solar/Wind Package	1.00	LS	0.00	$59,000.00	$59,000.00
1.9	Lodging and Per Diem	1.00	LS	0.00	$288,000.00	$288,000.00
1.10	Construction Survey	1.00	LS	30.00	$97,742.52	$97,742.52
1.10.1	Construction Survey	30.00	Day	30.00	$3,258.08	$97,742.52
1.11	Marine Mammal Observation	1.00	LS	150.00	$190,050.00	$190,050.00
1.11.1	Marine Mammal Observation	150.00	Day	150.00	$1,267.00	$190,050.00
1.12	Contingency (Assumed 10% of Construction Cost)	1.00	LS	0.00	$796,000.00	$796,000.00
1.13	Construction Admininstration	1.00	LS	690.00	$934,050.00	$934,050.00
1.13.1	Contract Administration	300.00	Day	300.00	$1,440.00	$432,000.00
1.13.2	3rd Party Testing	150.00	Day	150.00	$720.00	$108,000.00
1.13.3	Construction Inspection	150.00	Day	150.00	$1,763.00	$264,450.00
1.13.4	Engineering Support	1.00	LS	90.00	$129,600.00	$129,600.00
1.14	ICAP (4.79% of Cost Including Construction Admin)	1.00	LS	0.00	$464,000.00	$464,000.00
68				1,083.99		$10,157,611.45

August 22, 2016

Redstar Gold Announces $3.0M Investment by Eric Sprott

August 22, 2016: Redstar Gold Corp. (TSX.V: RGC, US: RGCTF, FRA: RGG) ("Redstar" or the "Company") is pleased to announce that Eric Sprott has agreed to acquire 30.0 million common shares of Redstar Gold in part through a private placement ("the Financing") of up to 41.0 million shares at $0.10.

Redstar Gold has filed for the Financing of up to 41.0 million common shares at $0.10 per share. This Financing is a non-brokered equity private placement. The Financing will be composed of two (2) tranches. In the first tranche of 20.4 million shares at C$0.10 is expected to close this week. In the second tranche, the Company will issue up to 20.6 million shares at C$0.10, or C$2.06 million. The full financing is expected to close on, or before, August 31, 2016. Upon final and full closing of the Financing, Mr. Sprott will control approximately 30.0 million shares, or 12.1% of the Company. Jacques Vaillancourt, Chairman of Redstar will also invest in this private placement. No warrants will be offered in respect to the Financing.

"Mr. Sprott is a highly respected and well known leader in the resource investment community and one of the world's premiere gold and silver investors. The Company will begin plans to initiate its next drilling program on the high-grade Shumagin Gold Zone at our 100% controlled Unga Gold Project in Alaska," **commented Peter A. Ball, President & CEO of Redstar Gold.**

The proceeds from the Financing will be used to commence drilling at the Shumagin Gold Zone, continue exploration across other known gold zones at the Company's Unga Gold Project, complete a NI 43-101 Technical Report at the Unga Gold Project, and for general working capital. The closing of the Financing is expected to occur on or before August 26, 2016 and is subject to the completion of formal documentation and receipt of regulatory approvals, including the approval of the Toronto Stock Exchange.

Mr. Sprott is acquiring the shares for investment purposes. Mr. Sprott has a long-term view of the investment and may acquire additional shares either on the open market or through private acquisitions or sell the shares either on the open market or through private dispositions in the future depending on market conditions, reformulation of plans and/or other relevant factors. A copy of Mr. Sprott's early warning report will appear on the Company's profile on SEDAR and may also be obtained by calling (416) 362-7172 (200 Bay Street, Suite 2600, Royal Bank Plaza, South Tower, Toronto, Ontario M5J 2J2).

The Common Shares issued pursuant to the Financing shall be subject to a four-month hold period from the closing date of the Financing in accordance with applicable securities legislation.

Shumagin Gold Zone

The Shumagin prospect is characterized by multi-episodic gold-silver bearing quartz-adularia-rhodochrosite breccia bodies that occur within structurally controlled dilation zones along the >1,200-meter-long Shumagin Scarp. High-grade gold-silver mineralization is open at depth within the main breccia body at Shumagin. Multiple dilation zones and coincident gold-silver bearing breccia bodies exist along strike of the Shumagin Scarp and remain to be fully drill tested.

About The Unga Gold Project

The 100% controlled Unga Gold Project covers key strategic portions of adjacent Unga and Popof Islands, approximately 900 kilometers southwest of Anchorage, Alaska. Redstar controls a 240 square kilometer land package that is host to numerous structurally controlled, volcanic hosted intermediate-sulfidation epithermal high-grade vein, breccia, stockwork and disseminated gold-silver occurrences.

The Unga Project has excellent infrastructure, including direct daily flights from Anchorage, a deep-sea port and a temperate climate. The former Apollo-Sitka gold mine, located on the southern Apollo-Sitka Trend, was Alaska's first underground gold mine and the site of historic high-grade gold production.

Selected drill highlights from the Shumagin Gold Zone:

Hole#	From (meters)	To (meters)	Length* (meters)	Gold Grade (g/t)	Silver Grade (g/t)
DDH-26	49.07	49.83	0.76	37.7	20.6
DDH-28	44.81	46.02	1.22	16.5	55.5
DDH-35	77.27	77.88	0.61	192.6	5403.4
DDH-42	132.59	134.11	1.52	30.96	35.0
DDH-46	153.62	154.84	1.22	365.35	190.6
DDH-51	156.06	156.67	0.61	182.02	88.5
DDH-57	38.1	39.62	1.52	59.59	50.05
BMS-01	272.8	278.28	5.49	24.02	19.4
11SH007	223.0	224.0	1.00	43.9	18.5
11SH009	210.1	211.0	0.9	43.1	37.2
11SH010	259.25	259.8	0.55	738.0	408.0
15SH011	60.1	62.0	1.90	202.0	82.0
15SH012	64.0	66.0	2.00	35.3	209.0
15SH012	82.0	85.0	3.00	16.95	183.0
15SH012	89.0	89.7	0.70	133.0	422.0
15SH013	144.0	145.0	1.00	17.45	122.0
15SH013	146.0	147.0	1.00	20.9	232.0
15SH014	187.0	188.0	1.00	19.9	16.0
15SH018	196.0	197.0	1.00	41.2	130.0

*True widths of the mineralized intervals are close to 70-80% of Core Length
**DDH-26, 28, 35, 42, 46, 51, 57 & BMS-01 are historic in nature and are not reported herein as new drill results
**11SH007-010 and 15SH011-018 have been previously disclosed and may be viewed on Redstar's Website at www.redstargold.com/s/NewsReleases.asp
* Stated lengths are core width as drilled

Jesse C. Grady, MSc, CPG-11592, is a Qualified Person as defined by NI 43-101. Mr. Grady has prepared and approved the technical information contained within this release.

About Redstar Gold Corp

Redstar is a junior exploration company focused on high-grade gold exploration in North America. In Alaska, the Company is exploring the 100% controlled high-grade Unga Gold Project. In Nevada, Redstar is currently seeking suitable partners to advance its portfolio of eleven (11) 100% owned properties located along and within many of the major gold producing trends. Redstar also owns 30% of the Newman Todd Gold Project, in Red Lake, Ontario, Canada. Newman Todd is a high-grade gold discovery along a 1.8 km corridor within the Newman Todd Structure (NTS).

COPY

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STATEMENT OF ACCOUNT

ACCOUNT	1957756
STATEMENT PERIOD	
FROM	08-01-16
THROUGH	08-31-16
PAGE	1

CITY OF SAND POINT, ALASKA
PO BOX 249
SAND POINT AK 99661-0249

ACCOUNT SUMMARY

SHARE ACCOUNTS		DIVIDENDS YEAR-TO-DATE	WITHHOLDING YEAR-TO-DATE	PREVIOUS BALANCE	NEW BALANCE
10	SHARE SAV	0.00	0.00	0.00	0.00
80	CERTIFICATE	1,205.74	0.00	202,054.73	202,208.32
81	CERTIFICATE	1,201.86	0.00	201,402.06	201,555.15
83	CERTIFICATE	382.76	0.00	200,230.56	200,382.76
	TOTAL SHARE ACCOUNTS				604,146.23

SHARE SAV - 10

Effective	Posted	TRANSACTION DESCRIPTION	AMOUNT	BALANCE	EXPANDED TRANSACTION DESCRIPTION
		PREVIOUS BALANCE		0.00	
		NEW BALANCE		0.00	
		DIVIDEND YEAR TO DATE	0.00		

CERTIFICATE - 80 (MATURITY DATE 12-11-2016) DIV RATE 0.895%

Effective	Posted	TRANSACTION DESCRIPTION	AMOUNT	BALANCE	EXPANDED TRANSACTION DESCRIPTION
		PREVIOUS BALANCE		202054.73	
08-31	08-31	DEPOSIT DIVIDEND 0.895%	153.59	202208.32	ANNUAL PERCENTAGE YIELD EARNED 0.90% FROM 08/01/16 THROUGH 08/31/16 BASED ON AVERAGE DAILY BALANCE OF 202,054.73
		NEW BALANCE		202208.32	
		DIVIDEND YEAR TO DATE	1205.74		

CERTIFICATE - 81 (MATURITY DATE 04-21-2017) DIV RATE 0.895%

Effective	Posted	TRANSACTION DESCRIPTION	AMOUNT	BALANCE	EXPANDED TRANSACTION DESCRIPTION
		PREVIOUS BALANCE		201402.06	
08-31	08-31	DEPOSIT DIVIDEND 0.895%	153.09	201555.15	ANNUAL PERCENTAGE YIELD EARNED 0.90% FROM 08/01/16 THROUGH 08/31/16 BASED ON AVERAGE DAILY BALANCE OF 201,402.06
		NEW BALANCE		201555.15	
		DIVIDEND YEAR TO DATE	1201.86		

CERTIFICATE - 83 (MATURITY DATE 12-15-2017) DIV RATE 0.895%

Effective	Posted	TRANSACTION DESCRIPTION	AMOUNT	BALANCE	EXPANDED TRANSACTION DESCRIPTION
		PREVIOUS BALANCE		200230.56	
08-31	08-31	DEPOSIT DIVIDEND 0.895%	152.20	200382.76	ANNUAL PERCENTAGE YIELD EARNED 0.90% FROM 08/01/16 THROUGH 08/31/16 BASED ON AVERAGE DAILY BALANCE OF 200,230.56
		NEW BALANCE		200382.76	

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STATEMENT OF ACCOUNT

ACCOUNT	1957756
STATEMENT PERIOD	
FROM	08-01-16
THROUGH	08-31-16
PAGE	2

CERTIFICATE - 83 (MATURITY DATE 12-15-2017) DIV RATE 0.895% (CONTINUED)

Effective	Posted	TRANSACTION DESCRIPTION	AMOUNT	BALANCE	EXPANDED TRANSACTION DESCRIPTION
		DIVIDEND YEAR TO DATE	382.76		

END OF STATEMENT