#### REPORT OF COMPLETED BATTERIES, ETC.,

DEFENSES AT MOUTH OF COLUMBIA RIVER, OREGON AND WASHINGTON,

submitted by Major W. C. Langfitt, Corps of Engineers, U. S. Army, in accordance with instructions contained in Cir. No. 18, dated Office Chief of Engineers, Washington, September 22, 1903

	Off	ice Chief of Engineers, "	1011 2110 4 4 1 1	•	خان سعدة الشابير في أنكاه بقار مهير الساب ما إلى إلى إلى إلى
	Name of Harbor	Name and Armament of Battery	Date when turned over to Artillery	Total cost	Remarks.
i	Columbia	FORT STEVENS, OREGON.  Battery Lewis.			Garrisoned.
		Mounted: 8 10-inch B.L.Rifles, Model 1888, MII., Nos. 11, 33 and 32, Bethlehim Iron Co., and Nos. 49, 52 and 48, Watervliet Arsenal. 6 10-inch disappearing car	gir ir großer in Straßer in straßer		Magazines dry. Electric appliances, including storage batter; located in emplacement No.5 good condition

riages; L.F. Model 1894, Nos. 38,4°, and 5, Kilby Apr.5,1898 2-4-Manufacturing Co.; L.F. Apr. 3,1898 \$302,014.08 ments 5 and 6 Model 1896, No. 4d, Niles 5-6-Tool Works; A.R.F., Model June 28, 1896, Nos. 2 and 30, Water 1900

town Arsenal.

Empl.1, Rifle 11, Car. 4d, يّa, ت 49, " 2, \* 4<sup>C</sup> 52, " 3, 48, " 5, y 11 4, 33, \* 23b Ħ 5, Ħ 32, 6,

Battery Clark.

Mount ed:

8 12-inch B.L.Mortars, MI., Model 1890, Nos. 29,32 and 35, Builders Iron Foundry; Nos. 34,48,50,51 and 52, Watervliet Arsenal.

8 12-inch mortar carriages, Model 1896; Nos. 119, 120,121,122,123,124,and 133, American Hoist & Derrick Co., and No.237, Watertown Arsenal.

Jan. 17, 1899

Magazines dry. Electric appli-71,546.63 ances, including storage battery in good condition.

#### Pit A:

Platf.1, Mortar 32, Car. 121, 2, 48, 119, 3, 50, 122, 52, \* 120. L 4, Pit B: Platf.1, Mortar 51, Car. 237, 35, W 123, 2, 133, ~ 5, 29, " 124. V 4,

ıg cy, 5,1 Storage battery serves emplaceonly. Emplacements 1 to 4 served by storage battery in emplacement 2 for 6-inch gun on disappearing

carriage. .

T		Date when		
Name of Harbor	Name and Armament of Battery	turned over to Artillery	Total cost	Remarks.
and the second distribution of the second flats and the second second second second second second second second	Battery.			Magazines dry
	The state of the s			Electric appli
	Mounted: 2 6-inoh B.L.Rifles, Model			ances, including storage batter
	1897, Nos. 4 and 11, MI., Watervliet Arsenal.			located in 6- inch emplace-
	2 6-inch disappearing car-			ment No. 2, 1
	riages, L.F., Model 1898, Nos. 7 and 8, Watertown	June 28, 1900	\$ 59,860.19	Storage batte
	Arsenal.			serves also e placements 1
	Empl. 1, Rifle 4, Car. 7,			4 of Battery
	# 2, # 11, # 8.			Lewis.
	Improved			Magazines dry
	No. of the Control of	The second second		Electric appl
• .		Marker While Seething	problem and	ances, includi storage batte
	Battery.	Arvilla is		located in ri
	2 emplacements for 6-inch		71 570 7	flank of the placements, i
	R. F. guns on Ordnance Dept. pedestal mount.	Jan. 17,	34,000.0	and an antight of
	Mounts and guns not yet			Storage batte
	received.			emplacements
		A COLOR		3-inch R.F.gt
	Battery.	and the second		
	Market Street Street	Art de		· •
	Mounted: 2 3-inch R.F.guns, Model			:
	1898, Nos. 30 and 35, Driggs-Seabury Co.			Magazines dr
		June 28,	11.954.5	The 3-inch en
	2 3-inch balanced-pillar mounts, Nos. 30 and 35,		1	lighted from storage batt
	Driggs-Seabury Co.			in 2 6-1nch
	Empl. 1, Gun 30, Car. 30,	1 1 W.W.		placements f R. F. guns o
	H 2, H 35, H 35.	Y 2.5 . A.A.	en Land Copy	pedestal mou
	A STATE OF THE STA			Electric app ances in goo
	Battery. e. C. mengawa			condition.
/	Mounted: 1 3-inch R.F.gun, Model			
/	1898, No. 115, Driggs-	Nov. 12,	5,398.	05
4/	Seabury Co.	1900	1	<del> :</del>
V	1 3-inch balanced-pillar	- 🗸		
	mount, No. 115, Driggs- seabury Co.			
	to the part has an alternative	The second secon		<i>i</i>
	The second second second second	·	· •	•
	vanuas et eller et e	and the state of the same		
			Ç.	
	Some Description of the			1.

Name of Harbor	Name and Armament of Battery	Date when turned over to Artillery	Total cost	Remarks.
	Central Electric Plant.	Jan. 19, 1901		The central electric power station is located in the right end of t parados of Battery Lewis. Station and plant good condition cost included cost of Batter Lewis and Clar
	B. C. Station, Emplacements 5 and 6, Battery Lewis	Nov. 29,	\$ 2,729.00	Ref. of site, 54.65. Ref. instrument ax 60.0. One room 14 feet by 14 feet. Concret structure; ste roof. Conspi ons at 4 mile usual channel of approach.
	1 Mining Casemate,	Apr. 30, 1901	7,885.25	In good condi
	l Torpedo Store-house,	Apr. 30, 1901	8,148.75	In good condi
	2 Cable Tanks,	Apr. 30, 1901		મ?
		HOLD TO THE		Annual Control of the

e di Bulkara Markara 🕡

Section 1

Name of Harbor

Name and Armament of Battery

Date when turned over to Artillery

Total cost

Remarks

Garrisoned.

Mouth of FORT COLUMBIA, WASHINGTON. Columbia River

Battery.

Mounted:

- 3 8-inch B.L.Rifles, Model 1888, Nos.20,MI.,23 MI., and 44 MII., Watervliet Arsenal.
- 3 8-inch disappearing carriages, L.F. Model 1896, Nos. 1 and 10, Pond Machine Tool Co.; Model 1894, experimental Southwark Foundry and Machine Co.

July 16, 1898

Magazines dry. Electric appliances, including \$137,298.79 storage battery in emplacement No. 2, in good condition.

Empl. 1, Rifle 20, Car. 1, # 23, # 10, 2, 44, experimental

Central Electric Plant Oct. 29,

1900

The central electric power plant for the 8-inch emplacements is an oil engine plant located in rear of emplacement No.3, of 8inch battery. Station and plans in good condition. Cost included in cost of 8-inch emplacements.

Magazines Elec-tric appliances

in condition. The power is supplied

Battery.

Mounted:

- 2 6-inch B.L.Rifles, Model 1897, Nos.15 and 24,MI., Watervliet Arsenal.
- 2 6-inch disappearing car- June 28, 1900 riages, L.F. Model 1898, Nos. 9 and 10, Watervliet Arsenal.

Empl. 1, Rifle 15, Car. 9, m 2, m 24, m 10.

by a duplicate oil engine plant one located in emplacement No.1 58,623.82 and one in emplacement No.2. They may be connected in parallel or each run separately.Three 3-inch emplacements also serve from this plant.

		and the second s		The state of the s
THE RESERVE OF THE PROPERTY OF	197 - France State (Control of the Control of the C	Date when		
مہ ۔	Name and Armament	turned	Total cost	Remarks
Name of	of Battery	over to	Total cost	Montal Ito
Harbor	OI Baveer,	Artillery		
The state of the s	Battery.	e e e e e e e e e e e e e e e e e e e		
	Daties.			
	Mounted:			_
. /	z z-inch R.F.guns.Model			dry.
1/	1898.Nos.97,98 and 104,			Magazines Elec- tric appliances in
V	Driggs-Seabury Co.	2-		good condition.
		June 28, 1900		Served from du-
	3 3-inch balanced-pillar	1-	\$ 15.462.61	plicate plant in
	mounts, Nos. 97,98 and	0ot. 29,	4 20,2000	two 6-inch em-
	104, Driggs-Seabury Co.	1900		placements, dis-
	Empl. 1, Gun 97, Car. 97.			appearing car-
); }	# 2, # 98, # 98,	_	1	riage.
	m 3, m 104, m 104.			-
		la de la composición dela composición de la composición de la composición dela composición dela composición dela composición de la composición dela com		Ref. of site,
				527.45.Ref. of instrument axis,
				329.0. One room;
		Mate Mate	1,666.00	
	B. C. Station, 8-inch	Nov. 29,	1,000.00	feet. Concrete
	battery,	1900		structure; steel
		F 2 V T		roof. Not con-
				spicuous at one
				mile, in usual
				channel.
		er connictifia		
	1 Mining Casemate,	Apr. 30,	7,885.00	
		1901	# 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5	rooms.dry.
	The second secon	3506		ad manage bar
Mouth of	FORT CANBY, WASHINGTON.			Garrisoned by detachment from
Columbia		10. C. 190		Pt.Stevens, Oreg.
River	Center Battery.	137.6		F 0.B 00 0 01.5 (0.1 og.
				Masonry platform,
	Mounted:			serviceable.
	1 15-inch smooth-bore gun			
				Service magazine
				caved in. Plat-
	2 8-inch converted rifles	•		forms unser-
			5 C C C C C C C C C C C C C C C C C C C	viceable.
	A Committee of the Comm			
	Right Battery.			
	Mounted:		To consider	Platforms un-
	2 8-inch converted rifles	•	4	serviceable.Ser-
				vice magazines
	Not mounted:			caved in.
	1 8-inch converted rifle,			
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e appropriate part of the second seco	The second secon		The state of the s	<ul> <li>If the property of the second section of the section of the second section of the section of the second section of the second section of the second section of the s</li></ul>

Respectfully submitted,

Changett.

Major, Corps of Engineers, U.S.A.

REPORT OF COMPLETED BATTERIES, ETC., DEFENSES AT MOUTH OF COLUMBIA RIVER, OREGON & WASHINGTON.

For the year ending December 31, 1910.

In charge of Major J. F. McIndoe, Corps of Engineers, U.S. Army.

Mame of harbor		Date when turned over to Artillery	Total cost.	Remarks.
Mouth of Columbia River	Battery Lewis. Mounted: 2-10" B.L. Rifles, Model 1888, MII, No.11 Bethlehem Iron Co., & No. 49 Watervliet Arsenal: 2-10" Disappearing carriages; L.F., Model 1894, Nos. 3a, Kilby Lifg. Co., L.F. Model 1896, No. 4d, Niles Tool Co. Emp.1, Rifle 11, Car.4d Emp.2, "49, "32	Apr.5,1898 Emp. #2p Apr.3,1898	\$302,014.00 also includes cost of Datteries Mishler and Walker.	Magazines dry. (Bat- tery rewired in 1909 & 1910. Current for light and power sup- plied from Central Power Plant.) Taylor Raymond shot hoists installed, both back delivery. Serial Mos. Emp. #1.No. 81 " 2," 82 Motor: Voltage 220. Speed :1060: capacity 5 H.P. Transferred to Artillery April 29, :1905. No powder hoists :installed. Retracting Motor in- stalled on carriage :#1 emplacement only.
	•	•	•	•

me of: Name and Armament turned over to Artillery.  Duth Battery Walker.  Of Battery.  Duth Battery Walker.  Of Battery Walker.  Of Battery.  Duth Current for light an power supplied from Central Power Plant.  Taylor Raymond shot hoists installed. But the surface of the								•		r
me of: Feme and Armanent over to total costs: arbor: of Battery. Artillery.  Artillery.  Magazines dry. Battery walker.  Such that the sum of t		mn mira	Dama 1	•		te when				
Artillery  Magazines dry. Batter rewired in 1909 & 193.  Current for light an power supplied from central Power Plant.  Levis. Fig- Arsenal.  2-10" disappearing carriages, L.F., Model 1894, Nos. 4C, 5, Kilby Mfg. Co.  Emp. 1, Rifle 52.Car.4C		)DRIKS.	Remai	cost.:		ver to		e and Arm	_	e of:
th Battery Walker.  Ith Hounted:    Current for light an power supplied from central Power Plant.   Central Power Plant.	7	nes dry. Battery	Magazines			tillery.	<u>A</u> :	01 Dasco1		roor:
bis 2-10" B.L. Rifles, bis 2-10" B.L. Rifles, iver Model 1888, M II, No. 52 & 48. Watervliet Arsenal.  2-10" disappearing carriages, L.F., Model 1894, Nos. 4c, 5, Kilby Mfg. Co.  Emp.1, Rifle 52.Car.4c  2-10" B.L. Rifles, See cost of Taylor Raymond shot hoists installed. Both hoists installed. Both hoists installed. Both hoists installed. In the segregated to the segregated segregated.  Speed 1060, capacity Speed 1060, capaci	ā.	t for light and	current f	:3			ker.	ttery Wall	Bat	
tver incident look watervliet  52 & 48. Watervliet Arsenal.  2-10" disappearing carriages, L.F., Model 1894, Nos. 4c, 5, Kilby Mfg. Co.  Emp.1, Rifle 52.Car.4c  2		I Power Figure	:Central :	•			fles,	T HT		um-
2-10" disappearing :ures could not well be :not well be :segregated. :Speed 1060, capacity :segregated. :Speed 1060, capacity :5 H.P. Transferred :Artillery Apr. 25, :June 27,1905. No positive in 2, "48" 5 :not well be :not well well well well well well well wel	al	alivery Serial	1101000	. J	:Batte	Apr.3,1898	rvliet	48. Water	· 近00er	ver :
: carriages, L.F., Mos. 1894, Nos. 4C, 5, Speed 1060, capacity is H.P. Transferred is H.P. Transferred in tillery Apr. 25, Inc. 1, Rifle 52. Car. 4C	. ]	" #2 " 84 " Voltage 220.	110000	ell pe	:ures		earing :	on along	:	
Emp.1, Rifle 52. Car.4°:  1	to	mranaferred t	:Speed 10		segr		5, 5,	Nos. 4c	carri	•
motors installed of	Io	27.1905. No pont	June 27		•	•	52 Car.4C	- 5:41.5	<b>:</b>	
	1	rs installed on carriages.	:motors :gun car		•		40	2, "4	. " 2	,
Battery Lyman Mishler.  Battery Lyman Mishler.  Ragazines dry. Battery Lyman Mishler.  rewired in 1909 &		-AN IN INUE OF -			:		n Mishler.	tery Lyman	Batt	
:Hounted:  2-10" B.L. Rifles.  11 Nos:  12 13 13 13 13 13 13 13 13 13 13 13 13 13	from	ent for power and the same supplied for	:Current			•	Rifles, M II. Nos	nted:	Moun 2-1	•
:33 and 32, Bethird Since See cost of :Taylor-Raymond Since See cost of :T	Roth	lor-Raymond Show	of :Taylor	cost of	See	:	Bethlehem	and oz, p	-33 8	
2-10" disappearing :June 28, :Bavely Fig : front delivery. St. 1900. :Lewis. Fig : front delivery. St. 1900.	97	nt delivery. Ser .: Emp. #1 No. 9	g- :front	tery is. Fig- a could	:Bat	: 1900		_10" disar	: 2-	
: Model 1896, Nos.2 and : not well be : Motor: Voltage 22	O, ity	or: Voltage 220,	be: d.:Motor:	Well p	•no					•
Emp. 1 Fifle 33, Car. 2b	or in	I.P. No powder m	:5 H.P.				-			
" 2. " 32, " 3 stalled on gun ce	TTT	illed on gun car.	:stalle		:		<b></b> ,			
			•		:	• • • • • • • • • • • • • • • • • • •				•
	120 1844		•		:	•	1. <b>-</b>		:	

Date when   Summer			r	•			
turned over to over the over			Date V	men:		•	
of: Name and Armament of Battery.  or: Artillery:  Artillery:    Magazines dry.   Storage battery in poor condition.   Selve B.L. Mortars, M.I.   Battery rewired in poor condition.   Battery for lighting supplied from Center for lighting supplied from Center for 1:899 and 1:910.   Curter for 1:899 and 1:910.   Curter for 1:899 and 1:910.   Curter for 1:899 and			tun	ned:		Remark	<b>8.</b>
### Battery:Clark.  **Storage battery in poor condition.  ### B.L.Mortars, M I. Battery rewired in poor condition.  ### B.L.Mortars, M I. Battery rewired in poor condition.  #### Model 1890, Nos. 29, 32 and poor condition.  ### Battery rewired in 1999 and 1910. Curry: 35, Builders Iron Foundry;  ### Found in 1999 and 1910. Curry: 1999 and 1910. Surplied from Cenry: 1899 and 1910. Curry: 1899 and 1999 and 1990		Tome and Armament	OVET	to:	Total cost		
Magazines dry.  Storage battery in poor condition.  Battery:Clark.  Storage battery in poor condition.  Battery rewired in poor condition.  Battery lighting supplied from Central Power Plant.  Storage battery in poor condition.  Battery lighting supplied from Central Power Plant.  Platf. No. 237, Watertown  Arsenal.  Pit A.  Platf. No. 237, Watertown  Arsenal.  Pit B.  Platf. No. 237, Watertown  Battery James Pratt  Nounted:  2.6" B.L. Rifles, Model  2.6" B.L. Rifles, Model  1899, 808. 1900  Battery power Plant.  Magazines dry.  Battery rewired in poor condition.	of:	neme and therv.	4-4-47	TATV:			
Battery Clark.  f Mounted:	or:	OI Dates	:AF CIL	10-1	ì	•	
Battery:Clark.  f Nonted: f Nonted: f Nonted:	•		•	•		is-magines	a dry.
f : Mounted:  m = 8-12" B.L.Mortars, M I.,  m = 8-12" B.L.Mortars, M I.,  shita : Model : 1890, Nos. 29, 32 and  ila : Model : 1890, Nos. 29, 32 and  ila : Model : 1890, Nos. 29, 32 and  ila : Mos. 34, 48, 50, 51 and 52,  waterviiet Arsenal.  8-12" mortar carriages,  Nodel : 1895, NI, Nos. 119, 120  Nortar : Merican Hoist & Derrick  Co. & No. 237, Watertown  Arsenal.  Pit A.  Platf. 1, Mortar : 32, Car. 121  " 2, " 48, " 119  " 2, " 35, " 123  " 3, " 50, " 123  " 3, " 50, " 123  " 4, " 29, " 124  Battery James Pratt  Mounted:  Recommendation : Nos. 4 and 11, M I.,  waterviiet Arsenal.  2-6" disappearing carri-  " 3-7, % 8, Watertown Arsenal.		· red owly	•	•		Magazino	nattery in
# Mounted: # 8-12" B.L.Mortars, M.I. # 8-12" B.L.Mortars, M.I. # 1900 and 1910. Currier for 11ghting # 1909 and 1910. Currier # 1909 and 1910. Currier # 1899 \$ \$71,546.63		Battery Clark.	:	•	· •.	:Storage	34 + 4 0 7
Heatery Fewl Section Company:  18-12" B.L.Morter3, 22 and 1909 and 1910. Current for 1890. Section Central Research  1909 and 1910. Current for 1189ting 1909 and 1910. Current for 1895. MI, Nos. 119, 120 121, 122, 123, 124 and 133, 122 121, 122, 123, 124 and 133, 122 121, 122, 123, 124 and 123, 122 123, 124 and 123, 122 124 124 124 125 125 125 125 125 125 125 125 125 125	Ω .		•	•		:poor con	arerone in
ila : Model 1890, Nos. 29, or 1890 and 1910 trans for lighting : 55; Builders Iron Foundry; rer : 55; Builders Iron Foundry; rent for lighting : supplied from Cenwatervliet Arsenal.  8-12" mortar carriages. 1899 : \$71,545.63 tral Power Plant.  8-12" mortar carriages. 1899 : \$71,545.63 tral Power Plant.  1891 : 1892 : 1899 : \$71,545.63 tral Power Plant.  1891 : 1892 : 1893 : 1899 : 1890 : 1890 : 1890 and 1910. Current for lighting : supplied from Cenvalence in : 1909 and 1910. Current for lighting : supplied from Cenvalence in : 1909 and 1910. Current for lighting : supplied from Cenvalence in : 1909 and 1910. Current for lighting : supplied from Cenvalence in : 1909 and 1910. Current for lighting : supplied from Cenvalence in : 1909 and 1910. Current for lighting : supplied from Cenvalence in : 1909 and 1910. Current for lighting : supplied from Cenvalence in : 1909 and 1910. Current for lighting : supplied from Cenvalence in : 1909 and 1910. Current for lighting : supplied from Cenvalence in : 1909 and 1910. Current for lighting : supplied from Cenvalence in : 1909 and 1910. Current for lighting : supplied from Cenvalence in : 1909 and 1910. Current for lighting : supplied from Cenvalence in : 1909 and 1910. Current for lighting : supplied from Cenvalence in : 1909 and 1910. Current for lighting : supplied from Cenvalence in : 1909 and 1910. Current for lighting : supplied from Cenvalence in : 1909 and 1910. Current for lighting : supplied from Cenvalence in : 1909 and 1910. Current for lighting : supplied from Cenvalence in : 1909 and 1910. Current for lighting : supplied from Cenvalence in : 1909 and 1910. Current for lighting : supplied from Cenvalence in : 1909 and 1910. Current for lighting : supplied from Cenvalence in : 1909 and 1910. Current for lighting : supplied from Cenvalence in : 1909 and :	Ĭ	O 72" B. L. Mortars, M. 1.		:	•		
la 35; Builders Iron Found 52, Nos. 34, 48, 50, 51 and 52, Watervliet Arsenal.  8-12" mortar carriages, Bodel 1896, MI, Nos. 119, 120 Nodel 1897, Watertown Norman Pit A. Platf. 1, Wortar 52, Car. 121 Nodel 1897, Mos. 4 and 11, MI. Watervliet Arsenal.  2-6" B.L. Rifles, Model Nos. 2-6" disappearing carri- Watervliet Arsenal.  2-6" disappearing carri- Nodel 1898, Nos. 1900 Nos. 4 and 11, MI. Norman Print for Ighting Supplied from Central Power Plant. Hodges type of Shot hoist installe Rack delivery. No Serial No. on hoists. Hand operat Supp. 1, Rifle 4, Car. 7.	m-	: 8112 1890 Nos. 29,32 and	•	:			77.02
Nos.34.48.50,51 and 52.  Nos.129,120.  Nos.231.19,120.  Nos.237.  Nos.237.  Platf.1,Mortar 32.Car. 121.  Platf.1,Mortar 51.Car.237.  Platf.1,Mortar 51.Car.237.  Platf.1,Mortar 51.Car.237.  Platf.1,Mortar 51.Car.237.  Nos. 24. 123.  Nos. 25. 123.  Nos. 25. 123.  Nos. 26. 123.  Nos. 27. 124.  Nounted:  Noun	ia	Model 1000 Tron Foundry;	•	•		L 27 AM	
Watervliet Arsenal.  8-12" mortar carriages.  1899 \$\frac{2}{7}1,546.63\$ tral Power Plants.  8-12" mortar carriages.  1899 \$\frac{2}{7}1,546.63\$ tral Power Plants.  1891 \$\frac{2}{7}1,546.63\$ tral Power Plants.  1895 \$\frac{2}{7}1,546.63\$ tral Power Plants.  1896 \$\frac{2}{7}1,546.63\$ tral Power Plants.  1897 \$\frac{2}{7}1,546.63\$ tral Power Plants.  1897 \$\frac{2}{7}1,546.63\$ tral Power Plants.  1899 \$\frac{2}{7}1,546.63\$ tral Power Plants.  1897 \$\frac{2}{7}1,546.63\$ tral Power Plants.  1899 \$\frac{2}{7}1,546.63\$ tral Power Plants.  1999 \$\frac{2}{7}1,546.63\$ tral Power Plants.  1999 \$\frac{2}{7}1,546.63\$ tral Power Plants.  1899 \$\frac{2}{7}1,546.63\$ tral Power Plants.  1909 \$\frac{2}{7}1,546.63\$ tral Power Plants.  1900 \$\frac{2}{7}1,546.63\$ tral Power Plants.  1	re T	:35; Bullders and 52,	•	-	<u> </u>		
**Raterviles and tar carriages, 1899 \$71,546.65 that are carriages	<b>-</b>	Nos.34,48,50,51		777		Subbitto	Plant.
### ### ##############################		.Watervliet Arsenal.	Jan.	17,	. ang 546.6	3 : trai Puv	1
*Model 1896, M.124 and 123, 121,122,123,124 and 123, 121,122,123,124 and 123, 121,122,123,124 and 123, 126.   *Co. & No.237, Watertown    Arsenal.  Platf.1, Mortar 32, Car. 121  " 2, " 48, " 119  " 2, " 50, " 122  " 3, " 52, " 120  Pit B.  Platf.1, Mortar 51, Car.237  " 2, " 34, " 133  " 4, " 29, " 124  Battery James Pratt  Magazines dry.  Battery rewired in 1909 and 1910. Current for lighting 1897, Nos. 4 and 11, M I., Supplied from Central Power Plant.  **Research 1896, Nos. 1900  **Solution 1909 and 1910. Current for lighting 1897, Nos. 4 and 11, M I., Supplied from Central Power Plant.  **Lodges type of 1800 ishot hoist installe 1808, L.F., Model 1898, Nos. 1900  **Solution 1900 ishot hoist installe 1900 is	•	Pen et a med	: 18	399	: \$1 T 10	•	1
### Indee		9_72" mortar carriages,	•		•	•	
: lan-icen Hoist & Derrick : do. & No.237, Watertown  Arsenal.  Pit A.  Platf.l.Mortar 32, Car. 121  2		7895 MI Nos . 119 . 120	•		•	•	
American his.  Co. & No.237, Watertown  Arsenal.  Pit A.  Platf.1, Mortar 32, Car. 121  Platf.1, Mortar 51, Car. 237  Battery James Pratt  Magazines dry.  Battery rewired in 1909 and 1910. Current for lighting supplied from Central Power Plant.  Part of disappearing carritum.  2-6" disappearing carritum.		imoder 103, 124 and 133,	i		•	•	
American Acrown  Arsenal.  Pit A.  Platf.1, Mortar 32, Car. 121  Platf.1, Mortar 32, Car. 122  " 4, " 52, " 120  " 4, " 52, " 120  " 4, " 52, " 123  " 2, " 35, " 123  " 3, " 34, " 133  " 4, " 29, " 124  Battery James Pratt  Mounted:  2-6" B.L. Rifles, Model  1897, Nos. 4 and 11, M I.,  Watervliet Arsenal.  2-6" disappearing carri- Watervliet Arsenal.	7	:121,122,120; Derrick	• •		•	•	
Pit A.  Platf.1, Mortar 32, Car. 121  Platf.1, Mortar 32, Car. 121  " 3, " 50, " 122  " 3, " 52, " 120  Pit B.  Platf.1, Mortar 51, Car. 237  Platf.1, Mortar 51, Car. 237  " 3, " 34, " 133  " 3, " 34, " 133  " 4, " 29, " 124  Battery James Pratt  Nounted:  2-6" B.L. Rifles, Model  1897, Nos. 4 and 11, M I.,  watervliet Arsenal.  2-6" disappearing carri- watervliet Arsenal.  2-6" disappearing carri- 2-6" disappearing carri- 3-7 & 8, Watertown Arsenal.  2-6" disappearing carri- 2-6" disappearing carri- 3-7 & 8, Watertown Arsenal.  2-6" disappearing carri- 2-6" disappearing carri- 2-6" disappearing carri- 3-7 & 8, Watertown Arsenal.  2-6" disappearing carri- 2-6" disappearing carri- 3-7 & 8, Watertown Arsenal.  2-6" disappearing carri- 2-6" disappearing carri- 3-7 & 8, Watertown Arsenal.  2-6" disappearing carri- 2-6" disappearing carri- 3-7 & 8, Watertown Arsenal.  2-6" disappearing carri- 3-7 & 8, Watertown Arsenal.  2-6" disappearing carri- 2-7 & 8, Watertown Arsenal.  2-6" disappearing carri- 3-7 & 8, Watertown Arsenal.  3-7 & 8, Watertown Arsenal.		- American Hols watertown	•			•	
Platf.1, Mortar 32, Car. 121  " 2, " 48, " 119  " 2, " 50, " 122  " 3, " 52, " 120  Pit B.  Platf.I, Mortar 51, Car. 257  Platf.I, Mortar 51, Car. 257  " 2, " 35, " 123  " 3, " 34, " 133  " 3, " 34, " 133  " 4, " 29, " 124  Battery James Pratt  Mounted: 2-6" B.L. Rifles, Model 1897, Nos. 4 and 11, M I., watefvliet Arsenal.  2-6" disappearing carri- watefvliet Arsenal.  2-6" disappearing carri- ages, L.F., Model 1898, Nos: 1900  259,860.19  Shot hoist installe Back delivery. No serial No. on hoists. Hand opera		.Co. & No.237, Water com-	• •		•	:	
Platf.1, Mortar 32, Car. 121  " 2, " 48, " 119  " 3, " 50, " 122  " 4, " 52, " 120  Pit B.  Platf.I, Mortar 51, Car. 237  Platf.I, Mortar 51, Car. 237  " 3, " 34, " 133  " 3, " 34, " 133  " 4, " 29, " 124  Battery James Pratt  Magazines dry. Battery rewired in 1909 and 1910. Current for lighting supplied from Central Power Plant. Watervliet Arsenal.  2-6" disappearing carri- Watervliet Arsenal.		ARGENA	•		•	:	
Platf.1, Mortar 32, Car. 119  " 2, " 50, " 122  " 3, " 52, " 120  Pit B.  Platf.1, Mortar 51, Car. 237  Platf.1, Mortar 51, Car. 237  " 2, " 35. " 123  " 3, " 34. " 133  " 4, " 29, " 124  Battery James Pratt  Nounted:  2-6" B.L. Rifles, Model  1897, Nos. 4 and 11, M I.,  watervliet Arsenal.  2-6" disappearing carri-  watervliet Arsenal.  2-6" disappearing carri-  2-6" disappearin		Pit A.			•	•	•
Pit B.  Platf.I.Mortar 51.Car.237  Pit B.  Platf.I.Mortar 51.Car.237  Part 2, " 35. " 123  " 3, " 34. " 133  " 4, " 29. " 124  Battery James Pratt  Mounted:  2-6" B.L. Rifles, Model  1897, Nos. 4 and 11. M I.  watervliet Arsenal.  2-6" disappearing carri-  ages, L.F., Model 1898, Nos: 1900		: 32, Car. 12	<u> </u>	•	•	•	
Pit B.  Platf.I.Mortar 51.Car.237  Platf.I.Mortar 51.Car.237  Platf.I.Mortar 51.Car.237  Platf.I.Mortar 51.Car.237  Platf.I.Mortar 51.Car.237  Battery 34. "133  "3. "34. "133  "4. "29. "124  Battery James Pratt  Rounted:  Part 1909 and 1910. Current for lighting supplied from Central Power Plant.  Watervliet Arsenal.  2-6" disappearing carri- Pages, L.F., Model 1898, Nos: 1900  Sages, L.F., Model 1898, Nos: 1900  Sages, L.F., Model 1898, Nos: 1900  Back delivery. No serial No. on hoists. Hand operated.		·Plati.i, mor n 48 " 13	19 :		•	•	
Platf.I.Mortar 51.Car.237  Platf.I.Mortar 51.Car.237  Platf.I.Mortar 51.Car.237  2. " 35. " 123  " 3. " 34. " 133  " 4. " 29. " 124  Battery James Pratt  Magazines dry.  Battery rewired in 1909 and 1910. Cur-  Battery rewired in 1909 and 1910. Cur-  Platf. Sattery rewired in 1909 and 1910. Cur-  Platf. Sat			22:			• •	
Platf.I.Mortar 51.Car.237  Platf.I.Mortar 51.Car.237  Platf.I.Mortar 51.Car.237  2. " 35. " 123  " 3. " 34. " 133  " 4. " 29. " 124  Battery James Pratt  Magazines dry.  Battery rewired in 1909 and 1910. Cur-  Battery rewired in 1909 and 1910. Cur-  Emp. 1. Rifles, Model  Jun. 28.  259,860.19  Magazines dry.  Battery rewired in 1909 and 1910. Cur-  Part for lighting supplied from Central Power Plant.  Hodges type of shot hoist installed the s		π 3, " 50, π 1;	20:			•	
Platf.I. Mortar 51. Car. 23  2.			•		•		
Platf.I.Mortar 51.Car.23  2. " 35. " 123  34. " 133  " 4. " 29. " 124  Battery James Pratt  Nounted: 2-6" B.L. Rifles, Model 1897, Nos. 4 and 11. M I., Watervliet Arsenal.  2-6" disappearing carri- 1909 and 1910. Current for lighting supplied from Central Power Plant. Hodges type of shot hoist installe Back delivery. No serial No. on hoists. Hand operated.		Pit B.	LT7 +		7	:	
Battery James Pratt  Nounted: 2-6" B.L. Rifles, Model 1897, Nos. 4 and 11, M I., Watervliet Arsenal.  2-6" disappearing carri- 2-6" disappearing carri- 34, " 29, " 124  Magazines dry. Battery rewired in 1909 and 1910. Cur- rent for lighting supplied from Cen- tral Power Plant. Hodges type of shot hoist installe Back delivery. No serial No. on hoists. Hand opera		Thortar 51, Car. 20	.77		•	•	
Battery James Pratt  Nounted:  Nounted:  Nounted:  Naterviet Arsenal.  2-6" disappearing carri-  ages, L.F., Model 1898, Nos: 1900  1897, Nos. 4 and 11.88    2-6" disappearing carri-  2-6" disappearing carri-  2-6" disappearing carri-  2-6" disappearing carri-  359,860.19  Hodges type of shot hoist installed the shot ho						• "	
Battery James Pratt  Nounted: 2-6" B.L. Rifles, Model 2-6" disappearing carri- 2-6" disappearing		~' n 34	ا دو		•	•	
Battery James Pratt Nounted: 2-6" B.L. Rifles, Model 1897, Nos. 4 and 11. M I., watervliet Arsenal.  2-6" disappearing carri- 2-6" disappearing ca	• •	. " 3,	24		•	*	
Nounted:  Nounted:  2-6" B.L. Rifles, Model  1897, Nos. 4 and 11. M I.,  Watervliet Arsenal.  2-6" disappearing carri-  3-59,860.19  Hodges type of shot hoist installed back delivery. No serial No. on hoists. Hand operated.		n 4,				***	ines dry.
Mounted:  2-6" B.L. Rifles, Model  1897, Nos. 4 and 11. M I.,  1897, Nos. 4 and 11. M I.,  Watervliet Arsenal.  2-6" disappearing carri-  2-6" disappearing carri-  3000  1900  1909 and 1910. data  rent for lighting  supplied from Central Power Plant.  Hodges type of  shot hoist installe  Back delivery. No  serial No. on  hoists. Hand operated.		Tomas Pratt	:		•	Magaz	rowired in
Nounted: 2-6" B.L. Rifles, Model 1897, Nos. 4 and 11, M I., watervliet Arsenal.  2-6" disappearing carri- ages, L.F., Model 1898, Nos. 1900  1909 and 1910. Car. supplied from Central Power Plant. Hodges type of shot hoist installe Back delivery. No serial No. on hoists. Hand operated.		· Battery James 1100	:		•	Batte	TY FEWITON CHE
2-6" B.L. Rifles, model 1897, Nos. 4 and 11. M I., supplied from Central Power Plant.  Watervliet Arsenal.  2-6" disappearing carri- Jun.28, 1900 \$59,860.19 Hodges type of shot hoist installed the same and the sam		. Wounted:	.i :		*	7000	BAU TATO. Amm
:1897, Nos. 4 and 12. :Watervliet Arsenal.  :2-6" disappearing carri- Jun.28, 1900			, <u> </u>		:		FOR IZELLAND
: Tall Fower type of Hodges type of Special No. on		· · · · · · · · · · · · · · · · · · ·	1.,		•		HAAR TYDM GGAT
2-6" disappearing carri- 1111.20 \$59,860.19 Hodges of installe shot hoist installe shot hoist installe shot hoist installe Back delivery. No Back delivery. No serial No. on hoists. Hand operation 1. Rifle 4. Car. 7.		ilogi, mist Argenal.	•		:	4	DUMBL LIGHT
2-6" disappearing carri- 1111.20 \$59,860.19 Hodges of installe shot hoist installe shot hoist installe Back delivery. No Back delivery. No serial No. on hoists. Hand operated.		:Mareraties ==	•	no	•		
:ages, L.F., Model 1896, No. :ages, L.F., Model 1896, No. :Back delivery. No. :serial No. on :serial No. on :hoists. Hand opera		4077	ri- :	Jun . 20	459 86	0.19 :Hoag	talle installe
:ages, L.r. move Arsenal.  :7 & 8, Watertown Arsenal.  :ages, L.r. move Arsenal.  :ages, L.r. move Back delivery.  :ages, L.r. move		2-6" disappearing 1898	Nos:	1900		shot	noist instant
:7 & 8, water to a serial hot ser		.ages. L.F., Moder rose	٠٦. :	**.	•	ಸ್ತಂದ	gerivera.
Emp. 1. Rifle 4. Car. 7.	• • .	n a Watertown Arsen			•		-T NO ON
Emp. 1, Rille 4, out 8 :ed.			_		•	-2019	ts. Hand opera
imp. 1. "" 11 " 8 ed.		pifle 4. Car.	7.		•	: TOIS	
		:Emp. 1. Little 11 u	8 :		•	:ea.	
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		:Date when:		
		turned:		Remarks.
	amament	· · · · · · ·	Total cost	
	Name and Armament	over to	1000	:
e of:	of Battery.	Artillery:		•
por:	01 200	. 11.		
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		an :		Magazines dry.
•	Bettery Constant Freem	<u> </u>		Magazines diy Battery rewired in
th:	Berrery our	•	•	D-1107 THVI
<u>.</u>	•	•	•	
of :	Mounted: Dieles Wode	.7 •	•	1909 and 1910 Current for light
um-	Mounted: 2-6" B.L. Rifles, Mode 2-6" B.L. Rifles, Wode	э <b>т</b> •	•	Current Ior 110
ัก <b>ำ</b> ณ	2-6" B.L. Rifles, model 1900, Nos. 4 and 8, Wat	ter-:		ing supplied from
			\$34,538.37	ing supplied relations of the contral Power Plant.
ver	:vliet Arsenal.	1902	: 20 T 10 10 10 10 10 10 10 10 10 10 10 10 10	Central Foundation
	: VIIOT AL SOM			
	Mounted: Parhette C	07-	•	HOISE THE WO
	Tent Barbette	O.A. A.		
	Mounted: 2 Ord.Dept.Barbette C 2 Ord.Dept.Barbette C 2 Ord.Dept.Barbette C 2 Ord.Dept.Barbette C	1.24	•	
•	riages, Model 1900.Nos and 25. Watervliet Ars	enal:	•	: hoists. Hand oper-
	watervilet his	,022-	•	·hoists. Hand of
	and 20, not	•	•	ated.
	Emp.1, Rifle 8, Car.	25.		. Bren.
	Rifle 8, Uar	0.4	•	<b>.</b>
	: <u>Emp</u> . 1, 2, 11	24	:	
	n 2, n 4,	•		•
		•	•	
	*			¬′•
	Mounted: Model	1898,	\$5,398.05	
	Mounted: 1-3" R.F.gun, Model 1-3" R.F.gun, Model	ry Nov.12		
	: 1-3" R.F.gun. model :No. 115, Driggs-Seabu	190	0:	
•	:110. 110, 11-00		•	
	:Co. 1-3" balanced-pilla:	<b>.</b>		
	halanced-Pilia.		•	<b>.</b>
_	175. Dr18	gs- :	•	
	: 1-3" balanced plans mount, No. 115, Drig	•	•	•
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	• 000=		•	
	Battery Elias Smu	<u>r</u>	:	
	Battery Bill		•	<b>↓</b> •
· · · · · · · · · · · · · · · · · · ·		•	•	- James
	· hatemake		•	Megazines dry.
÷	Mounted:  2-3" R.F.guns, Mod. 2-3" Royand 35. Dri	el Taao:	•	Current for light-
	· S-2" R.E. Suns, T-4	~~g=50-:	•	Tion from
	2-3" R.F.guns, mod :Nos. 30 and 35, Dri	55~	•	ing supplied from
	:703 • 50	•	:	:Central Power
	abury Co.	•	•	
	• • • • • • • • • • • • • • • • • • •		8. \$11,954	: Central Powers re- Plant. Battery re- wired in 1909 and
	2-3" balanced-pill	ar 35 Jun 20	8 : ŽTT'as.	.wired in Lyus and
	: 2-5" Dalamo and	1 35 · · · · · · · · · · · · ·		
i .	2-3" balanced-pill mounts, Nos. 30 and	- 19°	00.:	1910.
	mounts, Nos. 50 co. : Driggs-Seabury Co.	•	•	
}	- Triggs-boo	•	•	
*	Emp. No.1, Gun 30	car.30:		<b>\</b> :
Ţ.	To l. Gun 30	, n 25 •		<b>→</b>
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<b>A</b> .	:	•	•	
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In column of "Remarks", pages 1, 2 and 5, Report of Completed Batteries, etc., Defenses at Mouth of Columbia River, Oregon and Washington, for the year ending December 31, 1910, amend words "No powder hoists installed" to read "Type-C amend words installed, see sheet 4a".

The following table gives the location and data for each powder hoist installed:

:Capac -: ferred to Motor. Hoist Volt -: Speed. ity. : Artillery. Type: Location. No. : age : 31 : 220 :1600 RPM:5 h.p.: May 6 Emp.No. 1 :C-10": 220 :1600 RPM:5 h.p.: May 6 Bet.Lewis, 2 :C-10" 32 220 :1600 RPM:5 h.p.: May 6 Lewis, 1 :C-10" 33 220 :1600 RPM:5 h.p.:May 6 Walker, 2 :0-10" 34: 35 : 220 :1600 RPM:5 h.p.: May 6 Walker. 1 :C-10": 220 :1600 RPM:5 h.p.:May 6 Mishler, " :C-10" 36 220 :1600 RPM:5 h.p.:May 6 Mishler, 1 :C-10" 37 38 : 220 :1600 RPH:5 h.p.: May 6 Russell. 2 :C-10": Russell,

me of : erbor :	Name and Armament of Battery.	Date when: Turned: over to: Artillery:	Total Cost	Remarks.
lumbia:	Battery David Russell  Mounted:			Magazines dry. Em- placements being re- wired, and Power
	2-10" B.L. Rifles, Model 1900, Nos. 4 and 11, Watervliet Arsena	d: 1:Aug.12, 1904.	\$125,000.00	Plant being installed. Taylor Raymond shot hoists installed. Back delivery.
	2-10 disappearing carriages. L.F.Model 1901, Nos. 4 and 5, Watertown Arsenal.			: Serial Nos. : Emp. #1, No. 2141 *  " 2, " 2141 *
	Emp. 1, Rifle 4, Car. 2, " 11 "	4: 5:		Motor: Voltage 220, speed 1060, Capacity 5 H.P. Transferred to Artillery Aug. 12.
		• • • • • • • • • • • • • • • • • • •		:1904. No powder hoists :installed. Retracting, :elevating and travers- ing motors installed
	: :			on carriages Emplace- ments #1 & #2. Ordnanc motor generators and switchboard not in-
	F. C. Station,	Sept. 13		:Ref: of site 23.00. :Ref. of instrument
			•	exis 73.00. Lower room :15'3/4"x15'3/4". Upper :room 8'4"x8'4". Concret :column and steel tower
	•	•		can be distinguished on account of wire
		•		three miles when location is previously known. Surrounding trees and background
	• •	: :		are favorable for concealment.

Ee :		ate when		
ء قطر ۽	:	turned	motel Cost	Remarks.
of	Name of Station	over to the	TOTAL GODO	•
01	:	Artillery.:		• •
	:	·		
Harbor:			•	•
•	•		•	:Ref. of site 1031.
	Strangement a F44-c			Ref. of Site 103.75' Ref. of Inst. axis 105.75' Two rooms: observing room room 18'x15' booth room 18'x32' with 12 booths 3'9"x3'3" and C.O.room, 7'x9'6".
Mouth of	Battle Commander's:	Mar.30.1911	:\$ 6,300.00	men rooms: observing
	Station, C,		•	**room_18**15 pso no fra
Columbia			•	: 18'x32', With 12 booths
• • • • • • • • • • • • • • • • • • • •	•	•	•	: 319" x3' 3", and 0.0.100m,
River.			•	: 71x916".
	•	•	•	Reinforced concrete
			•	etructure with asphaltum
•	•		•	and gravel roof. Not con
• •			•	eniquous at 4 miles in
			•	usual channel of ap-
-		•	•	: proach.
*		•	•	: prosen.
	•	•	•	
	<b>3</b> .	•	•	· · · · · · · · · · · · · · · · · · ·
•		•	•	:Ref. of site 67'.
	Combined primary	•	•	:Ref. of Inst. axis 69.085'.
	station for first		7.4 9 730.0	0: One room 15 x15.
	.fire command and	· MST. OO, TOT	T:# 2,10000	O One room 15'x15'. Reinforced concrete
	TOURSHIP TYPE + CC	5	•	. structure. Not consult-
	station, Battery	•	•	uous at 4 miles in usua
	David Russell; Fj.	•	:	channel of approach.
	and B.C. (David	•	•	: Glianner or office
	:Russell)	•	. :	
	: Musserr)		•	
	•	•	:	•
			•	:
	•	•	. A. 💆	Ref. of site 20'.
	Combined primary	, . Mor 20 10.	וו \$ 8.072.	co. Daf of Inst. 8x15 72.
_	estation of the	:Mar. 30, 13.		:Six rooms: observing room
•	.third fire com-			Tall-Tal-three unlinished
•	mand and battery	<b>.</b>	•	
	-commander's sta-		•	-EVEL DIEM 1612196 PERST
	Later Rottery Clar	k:	<b>.</b>	.torg.men's dormitory 20
•	Fig and B.C. (Clark	<b>:</b>	:	x30' with lavatory.
	- 3	:	•	Wood frame building
	•		:	covered outside with
•		*	<b>:</b> .	GOAGLAG ORFSIGA MIGH
. •	•	•	•	corrugated iron, with
• .	•	•	•	reinforced concrete in
	•	•	•	strument pier. Not con
	•	•	•	. enignous at 4 miles in
		•	•	usual channel of ap-
	•	•	•	proach.
	•	•	•	• #
	•			

1	•				
(	Hame :		Date when :		
.4	:	Name of Station	turned :	Total Cost	Remarks.
	of :	Mame of Station	Artillery:		
	Harbor				
•	Haroor				
	•		:		Ref.of site 95'
		Secondary Station	:		Ref. of Inst. exis 98'
	Mouth of	secondary Station second fire com-	:Mar.30,1911:	\$1,050.00	One room 12'x12'
		mand, Fig.	:		:Reinforced concrete
•	Columbia :				: structure.Not con-
		•		i •	spicuous at 4 miles
•	River.			• . •	in usual channel of
		•		•	: approach.
	•				
	· · ·	Secondary station			:Ref. of site 95'.
	•	third fire com-	Mar.30,1911	\$1,050.00	:Ref. of Inst axis 98'
	to the second	mand, F%,			:One room 12'x12'
		• ———, -0,	•	•	:Reinforced concrete : structure. Not con-
		•	:	•	spicuous at 4 miles
	•			•	in usual channel of
	•		•		approach.
	•	:Primary station,	Y 70 1011	\$1,050,00	•
	•	:Battery David Rus	MEL. OO, TATT	. 91,000,00	:Ref. of site 95'.
		: sell, Bj, David		:	:Ref. of Inst.axis 981
		: Russell7	•		:One room 12'x12'
		:	• .		:Reinforced concrete
		Augusterian a	•	•	: structure. Not con-
			•	•	spicuous at 4 miles
		• • • • • • • • • • • • • • • • • • •			: in usual shannel of
		•		• • • • • • • • • • • • • • • • • • •	: approach.
			•	•	Ref. of site 95'.
		:Secondary statio	n:		:Ref. of Inst. axis 98'.
		:Battery Lyman	**** 70 7077	. & . 050 00	One room 12'x12'.
	•	:Battery Lyman :Mishler, By, (Lyma	n:Mar. 30, 1911	r: \$1,000.00	:Reinforced concrete
	•	:Mishler)		•	: structure. Not con-
	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	•			: spicuous at 4 miles
	·		•		: in usual channel of
	a water to the same		•		: approach.
	•			•	:
		•	· · ·	•	:
٠		Combined plotting	ng:	•	:Three rooms; operat-
	to the second	amoom for third		:	: ing room, 16'x20' : with 6' basement;
	•	:fire command and	1:Mar.30,191	1: \$6,870.00	storage battery
••	•	:switchboard room	n.:		room, 5'x20' with
		•	•	:	6'basement; plotting
	•	•	*	•	room, 19 x20 Re-
		:	•	•	inforced concrete
		•	•	•	: structure.
		<b>:</b>	• •	-	•

Le				
-		: Date when :		
		+nrned i	TOTAL	Remarks.
<b>.</b>	-	to the:	Cost.	
me	Name of Station	Artillery:	Coso	•
of	: Hamo c-	Artille	•	29.751
rbor :	•		, ·	Ref. of site 32.75' 67: Ref. of Inst. axis 35.20' Reinforced concrete structure; two rooms; observations (upper) 15'x15'.plott-
	· · · - Command-	-:	AR 308.	A7. Ref. of Inst. axis
outh	Battery Command-	t Nov. 9,1911;	750,000	67: Ref. of Inst. alls observe-
of	er's Station,		:	:Reinforced concrete :ture; two rooms; observa-
		• •	:	ture; two rooms; observed; ture; two rooms; observed; plott-
	:(Lewis),	•	1	tlon lapport 75' Not
(I A OT -	•	<b>:</b>	· ·	:ing (lower) is all miles in conspicuous at 4 miles in approach.
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	TOTT WOLKER	, WOV,	•	structure; two louis; x15'; servation (upper) 15'x15';
	B.C. (Walker)	•		:servaulou (apro) 15'x15'.
	: D. C.		•	:plotting \1000 at 4 miles
	•	•	-	:plotting (lower) is miles :Not conspicuous at 4 miles :Not conspicuous at 4 miles
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	<b>2</b>	•	:	Frame structure covered
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	Combined Plott	ing:	•	
	· Doom and During	<u> </u>	\$8.35/	6.16:ter; asphaltum gravor room
• • • • •	TART OF SECOND	d . :Nov. 3,20	÷∓ • ♣~ •	6.16:ter; asphaltum grating room Three rooms; plotting room
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•	Fire comme Ro	om :	•	- LLA ATTICEES WOLDS
•	& Plotting Rock	7 7 A7 6	<b>4</b> • •	
		)TTTOT .	:	men's dormitory 25'x64'
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*	Dormitory for	r Pri÷	•	
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	mary Stations	-100 NOV. 9,1	911:51,0	96.34:sides and copped 12'x20' :roof. One room 12'x20'
:	3 77 4 83 1, 1,63 1		5. \$	with lavatory.
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	Date when total : Remarks.
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Mouth of Columbia River.	Dormitory at Bath.  Dormitory at Bath.  100. 9,1911:\$7,680.93:metal and Fravel roof;  11e Commander's sphaltum gravel roof;  12e two rooms, 12:752; with
	Concrete structure with concre
	x 10' generator room  8' x 10'  8' x 10'  Pof of site 10.00'
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	:10'x10' observe, one 12'x room above, one 12'x room second floor and :13' on second floor and :16'x16' with lavatory :on ground floor.

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me of:	Name and Armament		Total cost	Remarks.
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hia.	Battery Walker	•	•	:8'4"X8'4". Concider. Con-
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ne finarbor	Name and Armament of Battery.	Date when turned turned to total cost Artillery:	Remarks
clumbia:1 liver :1 :2	Mining Casemete, Torpedo Storehouse, " Extension, Cable Tanks, Cable Tank Cover, Terminal Manhole,	Sep.22,1909:\$5,155.98 Apr.30,1901: 8,148.75 Sep.22,1909: 5,244.40 Apr.30,1901: 2,348.75  :Sep.22,1909: 2,935.34 :Sep.22,1909: 197.12	" " " ex- cept woodwork. In good condition
	F PGLEETHET MOUNTAIN		. !

#### ELECTRIC LIGHT PLANT AT BATTERY LEWIS

The plant is located in concrete structure built into the east end of the parados of Battery Lewis, having three rooms - one boiler room, 16' x 28'; two engine and dynamo rooms, each 11' x 28'.

One 80 H.P., vertical boiler, Erie Special, made by Erie Boiler Works, Erie, Pa. Date of purchase, July 1, 1901.

One 65 H.P., horizontal, high speed, steam engine, made by A. L.

Ide & Sons, Springfield, Ill. Date of purchase, April, 1898.
One 56-1/4 K.W., 125 volt, direct current, multipolar, compound wound, belted generator, made by Westinghouse Company. chase, April, 1898.

No transformers used.

There is one (1) storage battery operated and charged from this plant, as follows: One 60-ampere, Type F-13, 52 cells in glass jars, installed in and furnishing current for power for the Ordnance Depart-Date of purchase, April, 1898.

The above storage battery was made by the Electric Storage Battery

Company, Philadelphia, Pa.

This plant is used temporarily for charging storage battery in Battery Clark, which is used for operating motors in the Ordnance Machine Shop. It is proposed to dismantle the plant and storage battery as soon as the Ordnance Department are supplied with other source of power for motors. No current supplied for post lighting, searchlights or telautographs.

Cost of plant installed in power house, including the three storage batteries now dismantled, was \$12,896.70. Date of transfer to

the Artillery, January 19, 1901.

#### CENTRAL POWER PLANT

(Supplying current to all batteries except Battery Russell)

The plant is located in a reinforced concrete building 250 feet from right flank of Battery Clark.

Boilers: Two 100 H.P., horizontal, water tube, oil burning, manufactured by E. Keeler & Co., Williamsport, Pa., date of purchase July 8, 1909.

Engines: Two 70 H.P., horizontal, single cylinder, center crank, non-condensing, with fly-wheel governor, 305 R.P.M., steam, direct connected to generators. Manufactured by Buffalo Forge Co., Buffalo, N. Y. Date of purchase June, 3, 1909.

Generators: Two 50 k. w., 220 volts no load, 250 volts full load, multi-polar, compound wound, direct connected. Manufactured by the Western Electric Co., Chicago, Ill.

Transformers: None.

(💉

Storage Batteries: None.

This plant furnishes current for lighting and power in the following emplacements and buildings:

Batteries - Mishler, Walker, Lewis, Pratt, Constant Freeman, Elias Smur, Clark, Mining Casemate and Gun Cotton Storage Magazine.

Lewis and Walker. B. C. Sta.

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B. C. Sta. Clark,

and will be used for lighting all new R. F. Stations and dormitories, except those located in the vicinity of Battery Russell.

No current supplied for Post Lighting.

No current supplied for Searchlights.

No current supplied for Telautographs.

Kilowatts required for power and lighting:

The state of the s	•	20.7	
Inside illumination,		4.9	19
Antaiña "		21.6	
Motors, shot hoists,		* 24.0	
	<b>~</b> com	2.0	πŧ
Motors, retracting Fire Control, switchboard	1002	73.2	17
		+ 1º	ngta

\*Includes 5 retracting motors not yet installed.

The plant has been designed to allow for the installation of one additional 100 H.P. boiler, one 50 k.w., direct connected generating set and balancer set for Post lighting.

Total cost of plant, exclusive of conduit lines and underground cables, \$34.013.00.

Transferred to the Artillery December 15, 1910.

# ELECTRIC PLANT AT BATTERY DAVID RUSSELL.

The plant is located on the right flank of the battery. in a concrete structure having three rooms; engine room 15' x 21', radiator room 15' x 11' and storeroom 10' x 32'. structure was originally designed for and occupied by steam plant, which was transferred to the Artillery August 12, 1904. Steam plant has been dismantled. Cost of structure is indeterminate, as it was built in connection with the battery. The new plant consists of two 25 k.w. direct connected sets, as follows: two 4-cycle, 4-cylinder, vertical gasoline engines, type G.M. 12 A-2, 43/54 H.P., 560 R.P.M., Nos. 6790 and 6792, direct connected to two Type M.P.C., class 6-25-560, Form A., 230-V., direct current generators Nos. 195141 and 195415 respectively. Manufactured by General Electric Co., Schenectady, N.Y. Purchased in 1910. No transformers or storage batteries. Generators furnish current for lighting and power in the following emplacements and buildings: Emplacements Nos. 1 and 2

Battery David Russell; R. F. stations, "C", B1, B3, F3, F5, F1, District Signal Station and Dormitory at Fire Control Hill. No surrent is supplied for post lighting, searchlights or telautographa.

Kilowattage required for power and lighting:

- 10.2 k.w. Inside illumination, ... Outside Motors, shot hoists, 7.0 K.W. Motors, powder hoists, 8.0 K.W. Motors, retracting, Motor Generator set, Signal Sta. 36.0 k.w.

\*To be installed later.

No provision has been made for additional parallel units. The cost of the new plant, including alteration of power house was \$9,930. Transferred to the Artillery March 30, 1911.

### ELECTRIC PLANT FOR SEARCHLIGHTS NOS. 1 and 2, FORT STEVENS, OREGON.

The plant is located near the southwest end of the reservation, approximately 1500 feet southeast of Battery David Russell, and is housed in a firsproof, steel frame building, covered with

The plant consists of two 25 k.w. direct connected sets, as follows: two 4-cycle, vertical, gasoline engines, type G.M 12-A2-43/54 H.P., 560 R.P.M., Nos. 5514 and 5515, direct connected to expanded metal and plaster. two type M.P.C., class 6-25-560, Form A., 115-volt, direct current generators Nos. 195129 and 195122, respectively. Manufactured by General Electric Co., Schenectady, N.Y. Purchased in 1910.

Generators furnish current for two 60" projectors only. Kilotransformers or storage batteries. wattage required: two 60" searchlights at 20 k.w. each, 40 k.w.

No provision made for additional parallel units. The cost of the plant was approximately \$10,430.00. Transferred to the Artillery on July 28, 1911.

## SEARCHLIGHT PROJECTOR NO. 1.

60" - serial No. 8224, type EC, form N-2, class 60", manufactured by General Electric Co., Schenectady, N.Y. Purchased in 1910. Electrically controlled. Current supplied from power plant above described. Projector is fixed and installed in a frame, sheet-iron covered shelter near south end of reservation at Fort Stavens. Returns made to the Engineer Department. Cost of projector, \$5,312; of shelter, cable, etc., \$1,100. Transferred to the Artillery on July 28, 1911.

## SEARCHLIGHT PROJECTOR NO. 2.

60" - serial No. 8225, type EC, form N-2, class 60", manufactured by General Electric Co., Schenectady, N.Y. Purchased in 1910. Electrically controlled. Current supplied from power plant above described. Projector is fixed and installed in a frame, sheet-iron covered shelter near south end of reservation at Fort Stevens. Returns made to the Engineer Department. Cost of projector, \$5,312; of shelter, cable, etc., \$1,100. Transferred to the Artillery on July 28, 1911.

### ELECTRIC PLANT FOR SEARCHLIGHTS NOS. 3 and 4, FORT STEVENS, OREGON.

The plant is located 200 yards west of northeast corner of reservation, in a fireproof, steel frame building covered with

The plant consists of 1 - 25 k.w. direct connected set, as expanded metal and plastered. follows: one 4-cycle, vertical, gasoline engine, type G.H.-12, A-1-43/54 H.P., 560 R.P.M., No. 5512, direct connected to one type M.P.C., class 6-25--560, Form A., 115-volt, direct current generator No. 195130. Manufactured by General Electric Company. Purchased in 1910. No transformers or storage batteries.

Generator furnishes current for one 60" projector and for lights for torpedo loading room only. Kilowattage required: 1 - 60" searchlight, 20 k.w., inside illumination of Torpedo Loading Room, .7 k.w., and inside illumination of Power Plant, .7 k.w.;

totaí, 21.4 k.w.

Provision has been made for installing similar 25 k.w. set

for furnishing current for 36" searchlight No. 4. The cost of the plant was approximately as follows: Power House, \$3,920; Machinery, \$3,630. Transferred to the Artillery on March 7, 1912.

## SEARCHLIGHT PROJECTOR NO. 3.

60" - serial No. 8222, type EC, form N-2, class 60", manufactured by General Electric Company, Schenectady, N.Y. Purchased in 1910. Electrically controlled. Current supplied from 1 - 25 k.w. gasoline actuated generator set in power plant #3 and 4 des-

Projector is mounted in a specially designed corrugated iron cribed above. shelter, 100 yards north of power plant, equipped with a hoisting apparatus to elevate light to required height. Returns made to the Engineer Department. Cost of Projector, \$5,312; cost of shelter, \$2,225. Transferred to the Artillery on March 7, 1912.

## SEARCHLIGHT PROJECTOR NO. 4.

To be 36", under approved project. (Not supplied).

### ELECTRIC LIGHT PLANT AT BATTERY DAVID RUSSELL.

The steam plant, previously located in concrete structure on right flank of the battery, having two rooms 15'x32', and storage battery room 10'x32', has been dismantled and work is now in progress preparatory to The installation of two 25 k.w. gasoline actuated generating sets.

No transformers are to be used.

No transformers are to be used.

No storage battery installed.

The plant will furnish current for lights and motor service for

Battery Russell, alone.

There are two motor driven chain hoists installed in this battery and the carriages are fitted with maneuvering motors.

No Post lighting will be done from this plant, and no search-

lights are to be operated from it. The current requirements from this station will be as follows: For inside and outside illumination of defensive works, 6-1/2 k.w.; for motors. 15 k.W. Elect Plant, Landlights 1 + 2, Tt. stevens Searchlight Projectors.

There are two searchlights at Fort Stevens, Oregon, both used in connection with the submarine mine defense. The oldest is 30-inches in dismeter. It was made by the General Electric Co., and purchased in 1898. It is both electrically and hand controlled and has its own generator, steam connected, with boiler. Projector and plant are instal-The projector is movable, red in separate buildings provided for them. ...ithin a radius of 1,000 feet.

The returns for searchlights are made to the Engineer Department.

The cost of the projector is not known.

Transfer was made by the Engineer Department to the Artillery

Engineer in March, 1901. The other has a projector 36-inches in diameter. It was made by the General Electric Co., and purchased in 1907. It is both electrically and hand controlled. The plant consists of a three cylinder 6"x6" gasoline engine direct connected to a 74 volt,130 ampere generator. Both the projector and the plant are mounted on steel trucks, the whole forming a complete portable outfit. it is housed in a corrugated iron building constructed for this purpose and located near the Post power plant. Returns are made to the Engineer Department. The cost of the out-Transfer was made by the Engineer Department in fit is not known. January, 1908.

#### Tide Gages.

There is one Artillery tide gage at Fort Stevens, located on the jetty tramway 4,660 feet out from the root of the jetty. It is a staff gage without any house and was established and turned over to the Artillery in November 1906. Its cost was \$5.00. Is serviceable.

A tide gage, originally located on the Engineer dock at Fort Stevens has been moved to the Quartermaster dock. This gage is of the disk type, protected by a wooden house. Approximate cost \$200.00. fransferred to Artillery May, 1908.

## ELECTRIC PLANT FOR 30" SEARCHLIGHT, FORT STEVENS, ORE.

Location .- The plant is located on the northeast end of reservation approximately 1,000 feet west from Quartermaster's Dock and is housed in a wood frame building covered with corrugated sheet steel, which also serves as a shelter for the searchlight.

Boiler .- 20 h.p. vertical fire tube, serial #3300, manufactured by the Lidgerwood Mfg. Co.

Cirect connected, marine type, generating set. Manufactured by the General Electric Co., Schenectady, N. Y.

Engine .- Steam, 18 brake h.p. approximately, single cylinder, 6-1/2" bore x 5" stroke, 450 R.P.M., form A., serial No. 402.

Generator .- 10 k.w., 110 volts no load and full load, 91 amp., 4 pole, compound wound, form A., serial No. 13269, class 4-10-405.

Transformers and storage batteries .- None. This plant furnishes current for lighting the power plant and for 30" searchlight No.283. No current supplied for post lighting or telautographs.

Kilowatts required for power and lighting:

1 - 30" searchlight, - - - -Inside illumination, -

No provision is made for the installation of parallel units. Cost of plant not known. This plant was transferred from Willets Point in 1898, together with the searchlight. Transferred to the Artillery, March, 1901.

#### Searchlight Projector.

30" - serial No. 283, type E.C.F., electric control, manufactured by the General Electric Co., Schenectady, N.Y. Purchased in 1898 and shipped from Willets Point, N.Y., July, 1898. Current supplied from 30" searchlight plant described above. Mounted on car with a track connecting with Columbia River jetty railway, and has sufficient cable to be moved 1,000 feet. Returns of the searchlight made to the Engineer Department. Transferred to the Artillery, March, 1901.

## 36" PORTABLE SEARCHLIGHT, FORT STEVENS, OREGON.

Searchlight #3043.- Portable outfit No. 24, as described in the 4th supplement to mimeograph #39. Manufactured by the General Electric Co., Schenectady, N.Y. Type E.C., form M, 130 amp., D.L. 41418, electric control.

Engine.- #3905, 3-cylinder, 6" x 6", 4 cycle, gasoline, 600 R.P.M.

Generator. - #114889, multipole, differentially wound, separately excited, 74 volts, no load. 9.6 k.w., 150 amp., type M.P.6, form C. Exciter #145918, 110 volts.

Outfit purchased in 1907 and shipped from Fort Totten, October 5, 1907. Used in connection with submarine mine defense, and housed in wood frame building covered with corrugated sheet steel. located approximately 200 feet south of mining casemate. Returns made to the Engineer Department. Cost not known.

The same of the sa

Transferred by the Engineer Department to Artillery, January, 1908.

	·				
and of arbor.	Name and Armament of Battery.	Date when turned over to Artillery	Total	cost	Remarks.
outh of olumbia River	Fort Columbia, Wn. Battery Jules Ord.  Mounted: 3-8" B.L.Rifles, Model 1886, Nos. 20, MI., 23, MI., and 44, MII., Watervliet Arsenal.  3-8" disappearing car- riages, L.F., Model 1896, Nos. 1 & 10. Pond Machine Tool Co. & No. 32. Lake Erie Engineer Works.  Emp.1, Rifle 20, Car. 1 " 2, " 23, " 10 " 3, " 44, " 32	Jul.16,1898			Garrisoned.  Magazines dry. Bat- tery rewired, inter- ior and exterior, in 1910. Current supplied from Battery Jules Ord Power Plant. Stor- age battery to be dismantled. Taylor Raymond shot hoists installed. All back delivery. Serial Nos.: Emp. #1 - No. 2  " 2 - No. 1  " 3 - No. 3  Motor: Voltage 110; Speed 1060; capacity 3-1/2 H.P. Transfer- red to Artillery, Mar. 1908.
	Battery William Murphy Mounted: 2-6" B.L. Rifles, Mode: 1897, Nos. 15 & 24, MI Watervliet Arsenal. 2-6" disappearing car- riages, L.F., Model 1898, Nos. 9 and 10,		00:\$ 58	3,623.	Magazines dry. Elec- tric appliances in poor condition. The power is supplied by a duplicate oil engine plant, one lo- cated in Emp. No. 1 and one in Emp. No. 2. They may be connected in separately. Three 3"
	:Watervliet Arsenal.	9:10:			Emps.also served from this plant. Hodges type hand hoist installed.Back delivery: No Serial No. on hoist. Hand operated.

	,	Date when:		
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of :	Name of Station	Artillery		
Harnor				•
	CORT COLUMBIA, WN.		\$ 5.005.00	Four rooms: cot room,  8'10"x21'10":operating  room,15'9"x21'10":en-
	Mining Casemata,	:War. 30, 1311		: room, 15'9" x21'10" : gine room, 11'8" x21'10" : gine room, bettery room,
outh of:	Mrnr-9		,	gine room, 11 o aroom, storage battery room,
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columbia:				
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River		•	:	: covered with our care : metal and plastered.
	Switchboard roo	·· 30 1911	\$ 3,430.0	or one rooms: operating room, 16' x20', with 5'
	switchboard roo	m:Mgr. oo,	:	basement; storage bat-
	: Parace	•		
	•	•		
		•	•	
	•	:	•	metal and plastered.
	•		•	
	•		•	Four rooms: officers'
	•	•	•	:Four rooms: 016"717':
	•		•	dormitory, 9'6"x17'; officers' layatory.
	Dormitory for	· <b>:</b>	•	officers is dermitory.
	primary static	on:	•	6'x6'; men's dermitory, 00: 33'x17'; men's layetory,
	of second mine command and f	a : 6	11.8 2.290	.00: 33 x17 men s 12
	of geoma mind	or :Mar.30,19	TT: A man	: 10'6"x6'.
	stations of fi	fth:		wood frame building
•	fire command.	•	•	: wood frame built expanded : covered with expanded
-	: Fire Commont	•	•	metal and plastered.
	•	•	•	•
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	5.**		•	Ref. of site 326'. 5.00: Ref. of Inst. axis 328.97' Two rooms: observing room. 18'x18'; plotting room,
	: atati	on.:	02	5.00 Ref. of Inst. axis of room
ing salah sa	Primary	.om- Mar.30.1	att: # 5.00	5.00:Ref. of Inst. axis of room in the room in the room.
A Commence	second mine		•	: Two rooms: observing room, : 18 x18; plotting room,
*.	mand, M2,	•	•	
	•	:	:	The AND HIS . O I was a
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ķ.	•	•	•	building. Not contain spicuous at 4 miles in approach
	•		•	spicuous at 4 miles usual channel of approach
•	•	•		* Manager 1 = 1
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Note. - Plane of reference of all stations refers to mean lower low water.

		Date when : turned :	Total Cost.	Remarks.
Mare of Harbor.	Name of Station	Artillery.	1	Ref. of site 107.5".
TT-0		Nov.20,1911	\$3.096.16	Ref. of site 107.5 Ref. of Inst.axis 109.08' Reinforced concrete Reinforced concrete structure; two rooms, observation (upper)
U	B.C. (Ord),	:		(lower) room 15 x15.
		:		:Not conspictions: 4 miles in usual chan- :nel of approach.
	•	•	•	

	•	-		
e of :	Name and Armament of Battery.	Date when turned over to Artillery	Total cost	
th of umoia	Battery Frank Crenshaw Mounted: 3-3" R.F.guns, Model 1898, Nos.97,98 & 104, Driggs-Seabury Co.			:Magazine dry. Elec- :tric appliances in :poor condition. Ser- :ved from duplicate :plant in two 6" em- :placements, disappear- :ing carriages.
	:3-3" balanced-piller :mounts,Nos.97.98 & 104, :Driggs-Seabury Co.	Jun.28,1900 1 - 0ct.29,190	7	
	Emp. 1,Gun 97, Car. 97 " 2," 98, " 98 " 3," 104, " 104	:	: : : : : : : : : : : : : : : : : : : :	.00:Ref. of site 327 A5. Ref. of instrument
	B. C. Station, 8-inch Battery.	: :NoA.53,136	; ;	:axis 329.0. One room :14'x14'.Concrete
		•	:	:roof. Not conspictions :at one mile, in :usual channel.
	:_ 1 Mining Casemate.	Apr.30,19	001 \$ 7,885 :	:00:This mining casemate has been abandoned as such and new case mate under construc-
			•	tion.

## ELECTRIC LIGHT PLANT AT BATTERY JULES ORD.

The plant is located in a concrete structure protected against direct and indirect fire, and is located near the flank of emplacement No. 3 of the bettery. It contains two rooms - one 16' x 32' called the boiler room, the other 11' x 32' called the engine and dynamo room. While built for the installation of a steam plant it is not proposed to install such a

The present plant consists of one 16 H.P., Hornsby-Akroyd oil engine, purchased in September 1898. The engine is belted to a Westinghouse plant. direct current, multipolar, compound generator 11-1/4 k.w., 150 volt capacity. The generator was purchased in September 1898.

# ELECTRIC LIGHT PLANT AT BATTERY JULES ORD.

The plant is located in a concrete structure near the left flank of emplacement No. 3 of Battery Jules Ord. The structure was originally designed for the installation of a steam plant and contained two rooms an engine and dynamo room 11' X 32' and a boiler tained two rooms an engine and dynamo room 10' X 32'. Instead of a steam plant, an oil engine plant (see room 16' X 32'. Instead of a steam plant, an oil engine room and a 25 room 16' X 32'. Instead of a steam plant, an oil engine room and a 25 room 10' X 32'. k.w. gesoline set (See "New Power Plant" below) was installed in

The old plant consists of one 16 h.p. Hornsby-Akroyd oil engine, purchased in September, 1898. The engine is belted to a mestinghouse direct current, multipolar, compound generator. the boiler room. 11-1/4-k.W. 150 volt capacity. The generator was purchased in September 1999 The storage battery is installed. in emplacement No. 2 of the bettery. It is type F-11, capacity, 50 amperes; No. of cells, 56; in lead lined tanks; made by Electric amperes; No. of cells, 56; in lead lined tanks; made by Electric amperes; No. of cells, 56; in lead lined tanks; made by Electric amperes; No. of cells, 56; in lead lined tanks; made by Electric amperes; No. of cells, 56; in lead lined tanks; made by Electric amperes; No. of cells, 56; in lead lined tanks; made by Electric amperes; No. of cells, 56; in lead lined tanks; made by Electric amperes; No. of cells, 56; in lead lined tanks; made by Electric amperes; No. of cells, 56; in lead lined tanks; made by Electric amperes; No. of cells, 56; in lead lined tanks; made by Electric amperes; No. of cells, 56; in lead lined tanks; made by Electric amperes; No. of cells, 56; in lead lined tanks; made by Electric amperes; No. of cells, 56; in lead lined tanks; made by Electric amperes; No. of cells, 56; in lead lined tanks; made by Electric amperes; No. of cells, 56; in lead lined tanks; made by Electric amperes; No. of cells, 56; in lead lined tanks; made by Electric amperes; No. of cells, 56; in lead lined tanks; made by Electric amperes; No. of cells, 56; in lead lined tanks; made by Electric amperes; No. of cells, 56; in lead lined tanks; made by Electric amperes; No. of cells, 56; in lead lined tanks; made by Electric amperes; No. of cells, 56; in lead lined tanks; made by Electric amperes; No. of cells, 56; in lead lined tanks; made by Electric amperes; No. of cells, 56; in lead lined tanks; made by Electric amperes; No. of cells, 56; in lead lined tanks; made by Electric amperes; No. of cells, 56; in lead lined tanks; made by Electric amperes; No. of cells, 56; in lead lined tanks; made by Electric amperes; No. of cells, 56; in lead lined tanks; made by Electric amperes; No. of cells, 56; in lead lined tanks; made by Electric amperes; No. of cells, 56; in lead lined tanks; made by Electric amperes; No. of cells, 56; in lead lined tanks; made by Electric amperes; No. of cells, 56; in temoer. 1898. No transformers used. Storage Battery Co., Philadelphia, Pa; purchased in October, 1898. The generator and storage battery are used for post lighting only. The cost of the old plant, including storage battery, was about Transferred to the Artillery, October 29, 1900. (Under approved project for searchlight installation, this plant is to be removed and a 25 k.w. gasoline set installed in its place for operating searchlight No. 9).

NEW POWER PLANT .- The plant consists of a 4-cycle, 4-cylinder, Vertical gasoline engine, Type G.M.A 2-43/54, #5372, 560 R.P.M., direct connected to a 25 k.w. generator, 115 volt, multipolar, Type
M.P.C., class 6 - 25 k.w., Form A, \$183184, direct current. Manufactured by General Electric Co., Schenectday, N.Y. July, 1909. No transformers or storage batteries.

Generator furnishes current for lighting emplacements #1. #2
and #3 of Battery Jules Ord, and for power for the shot hoists; also
current for lighting stations F5. M2, B C (Ord), Dormitory and
current for lighting stations F5. M2, B C (ord), because the same of the shot hoists; also
current for lighting stations F5. M2, B C (ord), because the same of t lights or telautographs. Kilowattage required for inside illumination, 1.00: for outside illumination of defensive works, 6.70; for motors, 1.00: for switchboard room, 1.00. Plant has been arranged so as to 10.00; for switchboard room, 1.00. permit the installation of a duplicate gasoline actuated generating permit the installation of a duplicate gastine actually generation of set in same room. The cost of the new plant, including alteration of power house, was \$5,175. Transferred to the Artillery Feb. 10, 1911. power house, was \$5,175.

The certification of the streets

## ELECTRIC PLANT AT BATTERY JULES ORD.

The plant is located in a concrete structure near the left flank of emplacement No. 3 of Battery Jules Ord. The structure was originally designed for the installation of a steam plant and contained two rooms, an engine and dynamo room 11' x 32' and a boiler room 16' x 32'. Instead of a steam plant, a 16 h.p. Hornsby-Akroyd oil engine, purchased in September, 1898, was installed in the engine room: This engine was belt connected to a Westinghouse direct current, multipolar, compound generator, 11-1/4 k.w., 150 volt capacity, installed in the engine room.

A storage battery, type F-11, capacity 50 amperes, number of cells.

58, in lead lined tanks, made by Electric Storage Battery Co., Philadelphia, Pa., purchased in October, 1898, was installed in emplacement.

Eo. 2 of the battery.

During the years 1909-1910, the following set was installed in the boiler room; one 4-cycle, 4-cylinder, vertical gasoline engine, type G.M. A2-43/54, No. 5372, 560 R.P.M., direct connected to one 25 k.W. generator, 115-volt, multipolar, type M.P.C., class 6, 25 k.W., Form A., No. 183184, direct current. Manufactured by the General Electric Co. Purchased in July, 1909. No transformers. Transferred to the Artillery on February 10, 1911. Provision was made for a duplicate 25 k.w. gasoline actuated generating set in the same room.

During the year 1911, the Hornsby-Akroyd engine and 11-1/4 k.w. generator were removed, the partition between the engine and boiler rooms was removed, and provision made for the installation of one 25 k.w. gasoline actuated generating set to furnish power for the operation

The storage battery in Emplacement No. 2 is still used for the of Searchlight No. 9. lighting of the three emplacements in Battery Ord, and for Post lighting from about 10:00 P.M. to daylight. The storage battery is connected

The generator furnishes current for lighting emplacements Nos. 1, with the present generator. 2 and 3 of Battery Jules Ord, and for power for the shot hoists; also current for lighting stations F5, M2, B.C. (Ord), Dormitory and Switch-board Room. No current is supplied for searchlights or telautographs, but current is supplied for Post lighting from about 4:30 P.M. to 10:00 P.M.

Kilowattage required for inside illumination 1.00; for outside illumination of defensive works 6.70; for interior motors 10.00; for switchboard room 1.00, and for Post lighting approximately 2.8.

Cost of the old plant, including storage §6,950.00 battery, was about Cost of installation of present generating set and provision for installation 5.175.00 of 25 k.w. duplicate set Cost of removing partition and making 1.565.00 provision for 25 k.w. set for S.L.#9,

The storage battery is installed in emplacement No. 2 of the battery, for use when the generator is not running. It is Type F. 11, capacity, 50 ampere; No. of cells 58; in lead lined tanks; made by Electric Storage Battery Co., Philadelphia, Pa. Purchased in October

The generator furnishes light to the Battery Commander's Station, furnishes current for charging the storage battery, and for running the ammunition hoist motors, which are installed. This plant is too the ammunition hoist motors, which are installed engine actuated genesmall for the requirements. A 25 k.w. gasoline engine actuated genesmall for the requirements. rating set has been installed and provision has been made for the inlight installation provides for installing a third set, 25 k.w. gasoline actuated generating set, in the room now used for the Hornsby-This set will be for the operation of Searchlight \$\frac{1}{3}\$ of the approved project. This plant is used for Post lighting. The current required from this station is 9 k.w. for inside and

outside illumination of batteries, 10 k.w. for motors. The cost of the present plant, including storage battery, was

Date of transfer to the Artillery, October 29, 1900. about \$6,950.00.

## ELECTRIC LIGHT PLANT AT BATTERY WILLIAM MURPEY.

The plant is located in the emplacement rooms of Battery William Murphy.

Two (2) 7 H.P., Hornsby-Akroyd oil engines. Date of purchase, May

Two (2) 4 K.W., 110 volt, direct current, bi-polar, compound wound, belted generator, made by the General Electric Company. Date of purchase May, 1900. (This is a duplicate plant, which can be run singly or in parallel.)

No transformers used.

This plant furnishes current for lights in Battery William Murphy No storage battery installed. and Battery Frank Crenshaw, and is intended only for these two batteries. No motors have been supplied for the chain hoists in Battery William Murphy, but this plant is amply large for all known light or

No Post Lighting is done from this plant, and no searchlights are power requirements.

The current requirements from this electric plant will be as foloperated from it. lows: (1) For inside and outside illumination of defensive works, 3-1/2 k.w.; (2) For motors, 4 k.w.

Cost of this duplicate plant, about \$4,100.00. Date of transfer to the Artillery, October 29, 1900.

#### Searchlight Projectors.

There are two searchlights at Fort Columbia, both used in connection with the submarine mine defense. The diameter of the oldest It was made by the General Electric Company and one is 30 inches. purchased in 1898, shipment being made from Willett's Point, N. Y., July 19, 1898. It is both electrically and hand controlled, and has its own generator, steam connected, with boiler. The projector and plant are installed in separate buildings provided for them. jector is movable within a radius of 1,000 feet.

The returns for searchlight are made to the Engineer Department.

The cost of the projector is not known.

Transfer was made by the Engineer Department to the Artillery

Ingineer in March, 1901.

The other has a 36-inch projector. It was made by the General Electric Company, and purchased in 1907, shipment being made from Fort Totten, N. Y., on October 5, 1907. It is both electrically and hand The plant consists of a three cylinder 6"x6" gasoline controlled. engine direct connected to a 74 volt, 130 ampere generator. Both the projector and the plant are mounted on steel trucks, the whole making It is housed in a corrugated iron buildg complete portable outfit. ng constructed for this purpose and located on Chineman's Point.

Returns are made to the Engineer Department. The cost of the outfit is not known. Transfer was made by the Engineer Department in January, 1908.

#### Tide Gages.

There is one Artillery tide gage for Fort Columbia, established at Desdemona Light Station and turned over to the Artillery in It is a staff gage without any house, and its cost august, 1905. was \$15.00. Is serviceable.

A tide gage has been constructed on the Quartermaster's wharf at Fort Columbia, of the disk type, protected by a small wooden house, as recommended by 3rd. Supplement to Mineograph No. 62, Serial No. 314. Its cost was approximately \$200.00, and was turned over to the Artillery in May, 1908.

# ELECTRIC PLANT FOR 30" SEARCHLIGHT, FORT COLUMBIA, WASH.

Location .- The plant is located on the southwest end of the reservation, approximately 500 feet west of Battery William Murphy, and is housed in a wood frame building covered with corrugated sheet steel.

Boiler .- 20 h.p. vertical, fire tube, serial No. 3341, manu-Direct connected, marine type, generating set. Manufactured by factured by the Lidgerwood Mfg. Co.

the General Electric Co., Schenectady, N. Y.

Engine .- Steam, 18 brake h.p. approximately, single cylinder, 6-1/2" bore x 5" stroke, 450 R.P.M., form A, serial Ho. 400.

Generator. - 10 k.w., 110 volts no load and full load, 91 amp., 4 pole, compound wound, form A, serial No. 13268, class 4-10-405.

Transformers and storage batteries. - None. This plant furnishes current for lighting of the power plant and 30" searchlight No. 261. No current supplied for post lighting or telautographs.

Kilowatts required for power and lighting-

1 - 30" searchlight, - - 8.8 Inside illumination.

No provision has been made for the installation of parallel units. Cost of plant not known. Transferred to the Artillery, March, 1901.

## Searchlight Projector.

30" - serial No. 261, type E.C.F., electrical control. Manufactured by the General Electric Co., Schenectady, N.Y. Purchased in 1898 and shipped from Willets Point, N.Y., July 19, 1898. Current supplied from 30" searchlight plant described above. Searchlight mounted on truck and is movable within radius of 1,000 feet. Cost not known. Returns made to Engineer Department. Transferred to Artillery, March, 1901.

## 36" PORTABLE SEARCHLIGHT, FORT COLUMBIA, WASH.

Searchlight #3039.- Portable outfit, No. 25, as described in 4th supplement to mimeograph #39. Manufactured by General Electric Co., Schenectady, N.Y. Type E.C., form M. amperes 130, D.L.41418, electric control.

Engine.- #3906, 3-cylinder, 6" X 6", 4-cycle, gasoline, 600 R.P.M.

Generator - #145880, multipolar, differentially wound, separately excited, 74 volts no load, 130 amp., 9.6 k.w., type M.P. 6, form C.

Exciter #145909, 110 volts.

Outfit purchased in 1907 and shipped from Fort Totten, October 5, 1907. Searchlight used in connection with submarine mine defense and housed in wood frame building covered with corrugated sheet steel, located on Chinaman's Point. Returns are made to the Engineer Department. Cost not known.

Transferred by the Engineer Department to the Artillery, January,

1908.

harbor: of Battery Artillery:  Outh of: Fort Camby, Wash. Olumbia: Battery Harvey Allen. River: Nounted: 3-6" R.F.guns, Model - 1905, Nos. 13,17 and 16, Watervliet Arsenal.  3-6" disappearing car- riages, L.F., Model 1903, Nos. 86,87 and 88, South Bethlehem.  Emp. 1, Rifle 13, Car. 86 " 2, " 17, " 87 " 3, " 16, " 88  Battery Elijah O'Flyng  Mounted: 2-6" R.F. guns, Model 1905, Nos. 1 and 11, Watervliet Arsenal:  2-6" disappearing car- riages, L.F., Model 1903 : Mos. 1 and 11, Watervliet Arsenal:  2-6" disappearing car- riages, L.F., Model 1903 : Mos. 84 and 85, South Eethlehem.  Emp. 1, Rifle 1, Car. 84 " 2, " 11, " 85						
Suth of: Fort Marvey Allen.  River : Hounted: 3-6" R.F.guns, Model - 1905, Nos. 13,17 and 16,	ame of :	Thomas of the second	turned over to	•	ost:	Remarks.
riages, L.F., Model 1903, Nos. 86,87 and 88, South Bethlehem.  Emp. 1, Rifle 13, Car. 86 " 2, " 17, " 87 " 3, " 16, " 88  Battery Elijah O'Flyng  Mounted: 2-6" R.F. guns, Model 1905, Nos. 1 and 11, Watervliet Arsenal:  2-6" disappearing car- riages, L.F., Model 1903 Ros. 84 and 85, South Eethlehem.  Emp. 1, Rifle 1, Car. 84 " 2, " 11, " 85	olumbia:B River : :3	attery Harvey Allen.  Nounted: -6" R.F.guns, Model - 905, Nos. 13,17 and 16,				Garrisoned
<pre>:Watervliet Arsenal: 2-6" disappearing car- riages, L.F., Model 1903 Ros. 84 and 85, South Eethlehem.  Emp. 1, Rifle 1, Car. 84</pre>		riages, L.F., Model 1903, Nos. 86,87 and 88, South Bethlehem.  Emp. 1,Rifle 13, Car. 86 " 2. " 17, " 87 " 3, " 16, " 88  Battery Elijah O'Flyng Mounted: 2-6" R.F. guns, Model	:	\$58,935		Emplacements fully wired. Electrical plant being installed. The cost does not include mounting carriages. No shot hoists in-
		1905, Nos. 1 and 11, Watervliet Arsenal: 2-6" disappearing carriages, L.F., Model 1903 Hos. 84 and 85, South Bethlehem. Emp. 1, Rifle 1, Car. 84	: Feb. 27, 150	6:\$39,290	0.00	

#### Tide Gages.

A tide gage has been constructed on the dock at Fort Canby, of the disc type, protected by a small wooden house, as recommended by 3rd., Supplement to Mimeograph No. 62, Serial No. 314. Its cost was approximately \$155.00, and was turned over to the Artillery in August 1908.

Ter central power folant. See supplemental skeet (h/w) 2 worntled with 3897/218

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		Date when		
• • • • • • • • • • • • • • • • • • •			Total	Remarks.
Hame:	Name of Station	over to the	cost.	
of:		: Artillery	•	•
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ە ماللىرىسەن	•	•		Ref. of Inst. axis 296'.
Mouth :	Ctation	•		: Rei . OI Ins C. dals 230
of :	Primary Station	•	•	Three rooms; observing
Columbia:	of Fourth Fire	*** C 7077	44 749 69	.room 10'x10':0IIIcers'
Di-mare 1	· Commenc · Der cer res	3:NOA. 0'TaTT	· m. z. 1 . z. 1 . 0 .	room 10'x10'; officers'; dormitory, with lavatory,
WIACT.	Allen and O'Flyng		:	:10'x16'; men's dormitory
	TI (denby)	• •	:	TO XIO MOI S doing
	F <sub>4</sub> (Canby),		•	22'6"x26' including five
•	•	•	•	telephone booths and
	•	•	•	lavatory.
		•	•	Observation room, concrete
	. The state of th	•	•	Observation room, concrete
in the second second	State of the second section of		•	:dormitories, wood frame
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v.	Primary Station,		1.41.020.5	8:Ref. of Inst. axis 223'.
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	'HITCH'S (	•	•	idiamond mesh and plaster,
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- <del></del>		•	:	spicuous at 4 miles in
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*:			1 do 072 1	76: Wood frame covered with diamond mesh and plaster.
	Dormitory for B	2 :NOA · P'TAT	T: 50,0100	:diamond mesh and plaster,
		1 a 14 a		
		• Alamana	<b>1</b>	asphaltum and gravel roof
Section 1	•	•	•	:two rooms, officers' dormi-
		•	•	tory 10'x12' with lava-
	i e de la composición del composición de la com			tory to man a domitory
		* * * * * * * * * * * * * * * * * * *	•	:tory; and men's dormitory
***			•	:15'7"x18', with lavatory.
ANT DE		•	•	
		:	•	Wood frame structure
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		•	•	covered with diamond mesi
		AM . NOT & 10'	17:32.636.	35: and plaster, with asphal- tum and gravel roof. Two
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	:	•	•	:rooms, storage battery
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	•	•	:	:room 5'x19'6" with
		•	•	cement floor and frosted
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	e 🙎 e e e e e e e e e e e e e e e e e e	:	:	:16'x19'6".
	<u>-</u> • ,	•	:	:TO. XTA. O •
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# ELECTRIC PLANT FOR SEARCHLIGHTS NOS. 6 and 7, FORT CAMBY, WASH.

The plant is located on McKenzie Head at Fort Canby, Wash., in a fireproof, steel frame building covered with expanded metal and

The plant consists of 2 - 25 k.w. direct connected sets, as plastered. follows: two 4-cycle, vertical, gasoline engines, type G.H.-12, A2-43/54 h.p., 560 R.P.M., Nos. 6845 and 6846, direct connected to two type M.P.C., class 6-25-560, Form A, 115-volt, direct current generators Nos. 324513 and 324584. Manufactured by General Electric Company. Purchased in 1911.

No transformers or storage batteries. Generators furnish current for one 60" and one 30" projector only. Kilowattage required: 1 - 60", 20 k.w. and 1 - 30" search-light, 8.8 k.w., inside illumination .7 k.w.; total, 29.5 k.w. No provision has been made for additional parallel units.

The cost of the plant is approximately as follows: Power House, \$5,400; Machinery, \$7,360. Transferred to the Artillery on March 7, 1912.

# SEARCHLIGHT PROJECTOR NO. 6.

30" - serial No. 269, type ECF., class 30", electrically controlled, manufactured by General Electric Company, Schenectady, N.Y., transferred to this District from Seattle District by authority of 1st indorsement dated Office Chief of Engineers, April 13, 1911. (E.D.38971/116..Def.721/192). Date of purchase not known. Current supplied from power plant above described. Projector is fixed and installed in a frame, sheet-iron covered shelter on Mc-Kenzie Head. Projector has controller booth located on high point about 1/3 mile northwest of McKenzie Head. Returns made to the Engineer Department. Cost of projector, not known; cost of shelter and booth, about \$850. Transferred to the Artillery on March 7, (Temporary installation- E.D.68858/121 -- Def.721/172). 1912.

# SEARCHLIGHT PROJECTOR NO. 7.

60" - serial No. 8223, type EC, form N-2, class 60", electric-al control, manufactured by the General Electric Company, Schenectady, N.Y. Purchased in 1910. Current supplied from power plant described Projector is fixed and installed in a frame, sheet-iron covered shelter on McKenzie Head. Projector has controller booth located on McKenzie Head about 360 feet southeast of light. Returns made to Engineer Department. Cost of projector, \$5312. Cost of shelter and booth about \$850. Transferred to the Artillery on March 7, 1912.

## ELECTRIC PLANT FOR SEARCHLIGHT NO. 8, FORT CAMBY, WASH.

The plant is located on the southeast point of Fort Canby reservation in a fireproof, steel frame building covered with ex-

panded metal and plastered.

The plant consists of 1 - 25 k.w. direct connected set as follows; one 4-cycle, vertical, gasoline engine, type G.M. 1-12, lows; one 4-cycle, vertical, gasoline engine, type G.M. 1-12, lows; one 4-cycle, vertical, gasoline engine, type G.M. 1-12, lows; one 4-cycle, vertical, gasoline engine, type G.M. 1-12, lows; one 4-cycle, vertical, gasoline engine, type G.M. 1-12, lows type G.M. 1-12, lows to gasoline engine, type G.M. 1-12, lows type G.M. 1-12, lows to gasoline engine, type G.M. 1-12, lows to generator connected to one type A-1-43/54 h.p., 560 R.P.M., No. 5513, direct connected to one type A-1-43/54 h.p., 560 R.P.M., No. 5513, direct connected to one type A-1-43/54 h.p., 560 R.P.M., No. 5513, direct connected to one type A-1-43/54 h.p., 560 R.P.M., No. 5513, direct connected to one type A-1-43/54 h.p., 560 R.P.M., No. 5513, direct connected to one type A-1-43/54 h.p., 560 R.P.M., No. 5513, direct connected to one type A-1-43/54 h.p., 560 R.P.M., No. 5513, direct connected to one type A-1-43/54 h.p., 560 R.P.M., No. 5513, direct connected to one type A-1-43/54 h.p., 560 R.P.M., No. 5513, direct connected to one type A-1-43/54 h.p., 560 R.P.M., No. 5513, direct connected to one type A-1-43/54 h.p., 560 R.P.M., No. 5513, direct connected to one type A-1-43/54 h.p., 560 R.P.M., No. 5513, direct connected to one type A-1-43/54 h.p., 560 R.P.M., No. 5513, direct connected to one type A-1-43/54 h.p., 560 R.P.M., No. 5513, direct connected to one type A-1-43/54 h.p., 560 R.P.M., No. 5513, direct connected to one type A-1-43/54 h.p., 560 R.P.M., No. 5513, direct connected to one type A-1-43/54 h.p., 560 R.P.M., No. 5513, direct connected to one type A-1-43/54 h.p., 560 R.P.M., No. 5513, direct connected to one type A-1-43/54 h.p., 560 R.P.M., No. 5513, direct connected to one type A-1-43/54 h.p., 560 R.P.M., No. 5513, direct connected to one type A-1-43/54 h.p., 560 R.P.M., No. 5513, direct connected to one type A-1-43/54 h.p., 560 R.P.M., No. 5513, direct connected to one type A-1-43/5

# SEARCHLIGHT PROJECTOR NO. 8.

manufactured by General Electric Company, Schenectady, N.Y., transferred to this district from Seattle district by authority of 1st indorsement dated Office Chief of Engineers, April 13, 1911. (E.D. indorsement dated Office Chief of Engineers, April 13, 1911. (E.D. indorsement dated Office Chief of Engineers, April 13, 1911. (E.D. indorsement dated Office Chief of Engineers, April 13, 1911. (E.D. indorsement dated Office Chief of Engineers, Current supplied from 38971/116). Date of purchase not known. Current supplied from one 25 k.w. gasoline actuated generator set in power plant No. 8 one 25 k.w. gasoline actuated generator set in power plant No. 8 one 25 k.w. gasoline actuated generator set in power plant No. 8 one 25 k.w. gasoline actuated generator set in power plant No. 8 one 25 k.w. gasoline actuated generator set in power plant No. 8 one 25 k.w. gasoline actuated generator set in power plant No. 8 one 25 k.w. gasoline actuated generator set in power plant No. 8 one 25 k.w. gasoline actuated generator set in power plant No. 8 one 25 k.w. gasoline actuated generator set in power plant No. 8 one 25 k.w. gasoline actuated generator set in power plant No. 8 one 25 k.w. gasoline actuated generator set in power plant No. 8 one 25 k.w. gasoline actuated generator set in power plant No. 8 one 25 k.w. gasoline actuated generator set in power plant No. 8 one 25 k.w. gasoline actuated generator set in power plant No. 8 one 25 k.w. gasoline actuated generator set in power plant No. 8 one 25 k.w. gasoline actuated generator set in power plant No. 8 one 25 k.w. gasoline actuated generator set in power plant No. 8 one 25 k.w. gasoline actuated generator set in power plant No. 8 one 25 k.w. gasoline actuated generator set in power plant No. 8 one 25 k.w. gasoline actuated generator set in power plant No. 8 one 25 k.w. gasoline actuated generator set in power plant No. 8 one 25 k.w. gasoline actuated generator set in power plant No. 8 one 25 k.w. gasoline actuated generator set in power plant No. 8 one 25 k.w. gasoline a

## CENTRAL POWER PLANT, FT. CANBY, WASH.

The plant is located in a concrete building (15'x24') in the ravine between batteries Harvey Allen and Elijah O'Flyng, about 30 feet west of the Signal Corps Switchboard Room.

The plant consists of two 25 k.w. direct connected sets. The description of each set follows:

Set No. 1 consists of one 4-cycle, vertical, gasoline ergine, type G.M. 12-A2-43/54 H.P., 560 R.P.M., No.5538, direct ergine, type G.M. 12-A2-43/54 H.P., 560 R.P.M., No.5538, direct

set No. 1 consists of one 4-cycle, vertical, gasdinect engine, type G.M. 12-A2-43/54 H.P., 560 R.P.M., No.553S, direct connected to one type M.P.C., class 6-25-560, Form A., 230-volt, direct current generator No. 189033. Purchased in 1910.

Set No. 2 consists of one 4-cycle, vertical, gasoline

Set No. 2 consists of one 4-cycle, vertical, gasoline engine, type G.M. 12-A2-43/54 H.P., 560 R.P.M., No.6879, direct connected to one type M.P.C., class 6-25-550, Form A., 220-volt, direct current generator No. 368929. Purchased in 1912.

Both sets were manufactured by the General Electric

Company. No transformers or storage batteries.

These generators furnish power for the lighting systems of batteries Harvey Allen and Elijah O'Flyng, for range finding stations Fi and Bi, and dormitory of each, and for the Signal Corps Switchboard Room.

## Power Required:

		477.mino	tion -	1.8	k.w.
Battery Al.	len, outside	TTTUMTER		3.2	
Battery Al.	len, inside				k.w.
Battery O'	Flyng, outsid	16.			k.w.
Battery OF	Flyng inside	3			k.w.
Range Find	ing Sta. F4	and dormi			k.w.
Range Find	ing Sta. Bb -	•			k.W.
Dormi torv	for Station .	BA			
Signal Cor	ps Switchboa	rd Room	er geskip meg kales er kales er kales er kales er b		
			in a second control of the control o	<b>TT+T</b>	k.w.

No current is furnished for ammunition service; maneuvering of guns, post lighting, or for searchlights. No provision has been made for the installation of additional parallel units.

The cost of the plant is as follows:

Power House and installation set No. 1- \$8,886.00 Installation of Reserve (No.2) set - 200.00 Machinery (estimated) - 7,500.00

Transferred to the Artillery on November 26, 1912.

38971

	*			•
Name		Date when turned over to the:	Total Cost.	Remarks.
of	Datum Point.	Artillery:		<u></u>
Harbor		FLOTITION .		•
		Nov. 9,1911:	\$420.00	Three pile dolphin, with 6-foot target at an elevation of 20
of	:L.R.Columbia, :S.R.Canby,			:feet.Located approxi- mately 200 yds.south
Columbia			•	of lower end of Sand
River.			•	:Island.
	and advanced the property of the second seco	Transport of the second		Six foot target on
	One Datum Point, L.R.Stevens,	Nov. 9,1911	\$ 22.50	south side of jetty, 4 miles from Fort
	•			Stevens. Elevation of
	•	: The state of the state of		:target 20 feet.
				target 20 rect.
				*
	One Datum Point,	:Nov. 9.1911:	: \$ 20.00	:Six foot target,
	:M.R.Stevens,	-	•	1916ASTITUT VO TOOM
	:M. H. Draverz,		•	on south side of
and the second	•		•	:jetty. 2 miles from
			•	Fort Stevens.
	to the second of	•	•	
	. • The second was experienced by the second		•	Six foot target,
	One Datum Point,		# 20 00	elevation 20 feet,
	S.R.Stevens,	:NoA. a'Tatt	: \$ 20.00	on south side of
	e malah	•	•	:jetty. 1 mile
		•	:	from Fort Stevens.
			:	:ILOM FOL P Prevente.
in the state of a		*	•	
	One Datum Point,		•	Six foot target,
	:M.R. Columbia,	Nov. 9.1911	.: \$ 19.50	elevation 20 feet,
	M. K. GOTUMBLE,	•	:	on north side of
			3.53	:jetty. 1-1/2 miles
Section of the sectio	The state of the s			from Fort Stevens.
			•	
		on the same	•	Six foot target.
•	: One Datum Point,	. Now 0 301	: 3 79 A	elevation 20 feet,
Lead .	:M.R. Canby,	:MOA. A'TAT	r: A TS.O.	on north side of
<u> </u>	•		· •	:jetty. 4 miles
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				from Fort Stevens.
	•	•	•	TIOM FOL PAGAGES.

Name of Harbor.	Detum Point	: Date when : : turned : Total :over to the: Cost. : Artillery.:	Remarks.
Mouth of	One Datum Point S.R.Canby	Nov.26,1915 \$25.00	: Six foot target, : elevation of center : line, 20 feet above
Columbia:			: M.L.L.W., at Bent 428, : North Jetty,
River.		# 12 min	: S.2506' W.6561' : from Canby Light.
			•
	One Datum Point M.R.Canby	:Dec. 9,1915: \$25.00	: Six foot target, : elevation of center : line, 20 feet above
•			: M.L.L.W., at Bent : 1574 South Jetty, : S.15619' E 370'
•	•		: from Canby Light.
<b>~</b>			<b>:</b> <b>:</b>
•	e de la companya de l		•
•			<b>:</b>
			•
			* 1
		* * * * * * * * * * * * * * * * * * *	

Datum Points.

Three datum points, with locations, etc., have been established

for Defenses, Mouth of Columbia River, as follows:

No. 1. On Desdemona Light Station, visible from Forts Stevens. Columbia and Canby, transferred to the Artillery in August 1905. Cost \$27.00.

On dolphin located 8,487.61 feet south, and 26,863.32 No. 2. feet east from Cape Disappointment Light, visible from FortsStevens. Columbia and Canby, transferred to the Artillery in August 1905.

Cost. \$150.00. No. 3. On dolphin back of Sand Island, located 1,574.51 feet south, and 11,908.12.feet east from Cape Disappointment Light, visible from Forts Stevens, Columbia and Canby, transferred to the Artillery in August 1905. Cost, \$125.00.

Respectfully submitted.

The order

Major, Corps of Engineers, U.S.A.

பef. 655/29

2 48910 SE WAN DEPARTIMENT

Q,

Seattle, Wash., Mar.15,1910.

KUTZ,

MAJ. C. W.

Incloses additional sheets for insertion in his report of completed batteries for December 31,1909.

4 Inclos., E.D., not marked.

San Sal

Þ

# UNITED STATES ENGINEER OFFICE SEATTLE, WASHINGTON

March 15, 1910.

The Chief of Engineers,
United States Army,
Washington, D. C.

Sir:

- 1. I have the honor to acknowledge receipt this date of Department letter of February 18, 1910, (E.D. 48920/18), in reference to omission of data in regard to hoists in my report of completed batteries for December 31, 1909.
- 2. Four additional sheets for insertion in the report are inclosed herewith. Copies of the additional sheets have been furnished the Division Engineer and the Chief Engineer Officer of the Department of the Columbia.
- 3. The omission occurred through misunderstanding the instructions contained in Circular No. 39 and the amended instructions of Circular No. 42, O. C. of E., 1909.

Very respectfully,

Major, Corps of Engineers.

- 4 inclosures. -

# REPORT OF COMPLETED BATTERIES, ETC., DEFENSES AT MOUTH OF COLUMBIA RIVER, OREGON & WASHINGTON.

For the year ending December 31, 1915.

In charge of Lieut. Col. Chas. L. Potter, Corps of Engineers, U. S. Army.

Name of: Harbor.		: Date when turned : over to : Artiller	Total cost.	Remarks.
	FORT STEVENS, OREGON.	:		Garrisoned.
of :		•		Magazines dry. (Bat-
columbia:	Battery Lewis:	•		tery rewired in 190
;	Mounted:	:	•	:& 1910. Current for
	2-10" B.L. Rifles,			:light and power sup
:	Model 1888, MII, No.11	.:		. I i od from Central
	Model 1888, MII, No. 11 Bethlehem Iron Co., &	: Emp. #1	- :\$302,014.00	-Down Plent
;	No. 49 Watervliet	בים ביתראי	IU ISTRO TITOTAM	: Taylor-Raymond sho
:	Arsenal:		- :es cost of	1
;	2-10" Disappearing carriages; L.F., Model	:Apr.3,189	8.:Batteries	: note beek delivery.
:	2-10" Disappearing	(Minary Pt	:Mishier and	. Comical Nos :
	carriages; L.F., Model	•	: warker.	Burn #7 No 87
	1894, Nos. 3a, Kilby	Station Design	¢estila of jordina	: Emp.#1, No.81 : " #2, " 82
	Mfg.Co.,L.F.Model	•	\$	
ž	Mfg.Co.,L.F.Model 1896, No. 4 <sup>d</sup> , Niles	rija z vier	ug Algryta (af	: Motor:
	Tool Co.	*		:Voltage 220.Speed
		<b>a</b> :		:1060: capacity 5 H.
	Emp.l,Rifle ll,Car.4			: Transferred to
		ja• dag ad -		:Artillery April 29
	Emp.2, " 49, " 3	B:		:1905.
	en de werteren de de de verteren de de de les d En les de	Salara da Salara	er 🕻 🐧	: Type C powder
1. J. 1864 1 . 10				:hoists installed,
				: Serial Nos.:
	The state of the s			: Emp.#1, No.31.
	The state of the s			#2, No.32.
	* 1	<b>:</b>		: Motor:
	🕏 🚧 i i i i i i i i ještej i k	• •		:Voltage 220.Speed
				:1600; capacity 5 H
		Ti emal in		: Transferred to
			<b>.</b>	:Artillery May 6,19
	<b>♣</b> 1 <b>3 3 3 3 3 3 3 3 3 3</b>		La 🎉 a gradina y	: Retracting Motors
				:installed on carri
				:#1  emplacement
	: Battery Walker:		A Barbara	:Magazines dry.Batt
	I was a way of the second	:		:rewired in 1909 &1
	: Mounted:	:		:Current for light
	: 2-10" B.L.Rifles,	•	<b>.</b>	:power supplied fro
	:Model 1888, M II, No.		<b>*</b>	:Central Power Plan
	:52 & 48, Watervliet	:		: Taylor Raymond sh
	:Arsenal.	:Apr.3,18	198.:Battery	:hoists installed.B
	•	•		:back delivery.Seri
	: 2-10" disappearing		:umes could	:Nos.Emp.#1 No.83.
	:carriages, L.F., Mode		:not well be	
	:1894, Nos. 4°, 5,			: Motor: Voltage 22
	:Kilby Mfg. Co.		: 1	:Speed 1060 capacit
			h ♥	:5 H.P. Transferred
	· · · · · · · · · · · · · · · · · · ·			
	:Emp.l Rifle 52 Car	16	•	
	: Emp.1, Rifle 52, Car.	_ ` .		:Artillery Apr.25,1
	M	40. 5 :		:Artillery Apr.25,1 :June 27, 1905. papet
		_ ` .		:Artillery Apr.25,1

***************************************				
Name of: Harbor.:		Date when turned over to Artillery.	Total cost.	Remarks.
of :	Battery Walker (Cont.)			Serial Nos.: Emp.#1, No.33, #2, " 34.
Columbia: River. :		: :		: Motor:
•				: Voltage 220. : Speed 1600 RPM.
•				Capacity 5 H.P.
			Contract Contract	Artillery May 6,1912.
:			Retracti	ng motors installed on carriages,
:	Battery Lyman Mishler	es es lillega		emplacements 1 & 2. : Magazines dry.
	Mounted:		•	:Battery rewired in
:	2-10" B.L. Rifles, Model 1888, M.II, Nos.			:1909 & 1910.Current :for power and light-
;	33 and 32, Bethlehem	en egen gada - haday e manasan d	• 1000 to 1000	ing supplied from Central Power Plant.
	e de la companya del companya de la companya del companya de la co	June 28,	See cost of	. Taylor-Raymond shot
	: 2-10" disappearing carriages; A.R.F.	<b>Tago</b> .	:Battery Lew- :is. Figures	hoists installed. Both front delivery.
4	Model 1896, Nos. 2 and 3b, Watertown Arsenal.		could not	:Both front delivery. : Serial Nos. : Emp.#1, No.97.
•	The state of the s	<b>:</b>	regated.	: " #2, " 98.
- 12 4 4 4	Emp.1, Rifle 33, Car.2.		: :	: Motor: :Voltage 220.
, ,		•	:	:Speed 1060. :Capacity 5 H.P.
,		•	• •	: Transferred to
		<b>:</b> :	<b>:</b>	:Artillery June 17,'05 : Type C powder
		:		:hoists installed. : Serial Nos.:
				: Emp.#1. No.35.
				: " #2, " 36. : Motor:
			•	: Voltage 220.
	<ul> <li>London Company of the Compa</li></ul>	•	. <b>.</b>	:Speed 1600 RPM. :Capacity 5 H.P.
			rita de la composition della c	: Transferred to :Artillery May 6,1912
				:No motors installed
		. A jezot	a <b>k</b> idda a marka kida kida kida kida kida kida kida ki	on gun carriages.
	: Battery David Russell : Mounted:	•	, <b>t</b> will be be to the	: :Magazines dry.
	: 2-10" B.L. Rifles,	:	:	:Battery rewired in :1910 & 1911.Power
	:Model 1900, Nos.4 and :11, Watervliet Arsen-	Aug.12,1904	\$125,000.00	:plant installed in
	:al. : 2-10" disappearing	•	1 <b>:</b> 1 <b>:</b>	:1910 & 1911. :Taylor-Raymond shot
	:carriages, L.F.Model	- - - - -	. <del>-</del>	:hoists installed.
	:1901, Nos.4 and 5, :Watertown Arsenal.	**	¥• can 1 <u>•</u> cangaan	: Back delivery. : Serial Nos.:
	: :Emp. 1, Rifle 4, Car.4.	•	<b>b</b>	: Emp. #1, No.2141* : " 2, " 2141*
	: " 2, " 11 " 5:			:Motor:Voltage 220.

<sup>\*</sup>The only numbers which could be found on hoists. Number evidently wrong.

Name of:	Name and Armament of Battery.	Date when turned over to Artillery.	Total cost.	Remarks.
Mouth :	Battery David Russell: (Continued)			(Motor) Speed 1060. Vapacity 5 H.P. Transferred to
columbia:		•	•	:Artillery Aug.12, :1904.
River.			• • • · · · · · · · · · · · · · · · · ·	: Type C powder hoists installed. : Serial Nos.: Emp.#1.No.37 #2,No.38.
:				Motor: Voltage 220; Speed 1600 RPM; Capacity 5 H.P. Transferred to Artillery May 6,191;
		Data Tunian B Ala Lind Avia Hala Li Ala Hangasa		Retracting, ************************************
	Battery Clark Mounted:			Magazines dry.
	: 8-12" B.L.Mortars, I :I Model 1890, Nos. 29, :32 and 35, Builders I :Foundry; Nos. 34,48, :50, 51 and 52, Water :vliet Arsenal.	ron :	dwg 546 67	:Battery rewired in :1909 and 1910. Cur- :rent for lighting :supplied from Cen-
	: 8-12" mortar carria :Model 1896, MI, Nos.11 :120,121,122,123,124 :and 133, American :Hoist & Derrick Co. :& No.237, Watertown :Arsenal.	ges, 9: :	99:\$71,546.63	: crar power promot
	Pltf.1, Mortar 32, Car 2, " 48 " 3, " 50 " 4, " 52 " Pltf.1, Mortar 51, Car 2, " 35 "	119 122 120 : 1237		
	" 3, " 34 " " 4, " 29 "			• • • • • • • • • • • • • • • • • • •

		Date When:		
Nome of	Name and Armament :	turned .	m	7
Name of:	of Battery.	over to:	Total cost	Remarks
Harbor.:		Artillery:		
		• (		
Month -	Battery James Pratt	•	• •	
	: Mounted:	• •		Magazines dry.
. o. tamin [U]	2-6" B.L.Rifles Model .		:	Battery rewired in
Pires *	2-6" B.L.Rifles, Model : 1897, Nos. 4 and 11, M.I., :	•	:	1909 and 1910. Cur-
TUTA GT.	:Watervliet Arsenal.	. •		rent for lighting
<b>:</b>			:	supplied from Cen-
:			\$59.860.19:	tral Power Plant.
:	ages, L.F. Model 1898, Nos.:		:	:Hodges type of
i •	7 & 8, Watertown Arsenal.		:	shot hoist instal-
:		•		led. Back delivery.
•	Emp. 1, Rifle 4, Car. 7.	•		No serial number
•	" 2, " 11, " 8.			on hoists.
i •		t		Hand operated.
•	•	:	:	3
•	Battery Constant Freeman	١., ١	:	
	: Mounted:	<b>:</b>		Magazines dry.
	:2-6" B.L. Rifles, Model :	:	:	:Battery rewired
	:1900. Nos. 4 and 8, Water- :			in 1909 & 1910.
•	vliet Arsenal.	: Jan.17,	:	Current for light-
•	general de la company de la c	: 1902.	:\$34,538.37:	ing supplied from
	: Mounted:	*	:	:Central Power
	: 2 Ord.Dept.Barbette car-			:Plant. Hodges
•	:riages, Model 1900.Nos.24	:		type shot hoist
	riages, Model 1900.Nos.24 and 25, Watervliet Arsenal	:		installed. Back
1	:	:		delivery. No ser-
	: Emp.1, Rifle 8, Car. 25	:		ial number on
	: " 2, " 4, " 24	:		:hoists. Hand
	• 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	• ·		coperated.
	: Mounted:	English Sur	•	•
	: 1-3" R.F.gun, Model 1898	· Nov 19	\$ 5 XQD OF	•
	:No.115, Driggs-Seabury Co.	: Nov.12, : 1900.	. ₩ J,JJO•UD	•
	: 1-3" Non-Dis. carriage :Model 1898 MI No.115.	. ±200.	•	• · · · · · · · · · · · · · · · · · · ·
	: Model 1898 MI No. 115, : Driggs-Seabury Co.	· ·	•	:
	· La Loon Nowbury Out	. <del>-</del>	:	:
	: Battery Elias Smur:	<b>\$</b>	<b>12</b> .	:
	: Mounted:	**************************************	:	:
3	: 2-3" R.F.guns, Model 1898	•	*	:Magazines dry.
	:Nos.30 and 35. Driggs2	•	•	:Current for light
	:Seabury Co.	•	:	:ing supplied from
			•	:Central Power
			:\$11,954.57	:Plant. Battery
	:Model 1898 MI, Nos.30 & 35		•	:rewired in
- 8	:Driggs-Seabury Co.	•		:1909 and 1910.
		•	<b>*</b>	:
	: Emp. No.1, Gun 30, Car. 30.	:	:	:
	т п 2, т 35, т 35.	•	•	:
		<b>:</b>	•	•
	y de la companya del companya de la companya del companya de la c	:	:	:
			•	:
	•	•	. \$	
	and the second second			
		Jack William	transfer of the second	
	o tik tenyik kelik			
	en in the second of the second of the	<b>C</b> (1)	÷	
	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1			
		*		
			•	,
		19		

Name		Doto whom		
of :	Name of Station	Date when		
Harbor.	. Name of Station	to the	Total cost	Remarks.
marbor.	-			
		Artillery.		
36 a mada la	D-441- C	ti e e	0.0	.D.AA
	:Battle Commanders:			:Ref. of site 103'.
	: Station, C,	Mar. 30, 1911:		Ref. of Inst.axis 105.75
of :				:Two rooms:
	:			cobserving room 18'x16'
olumbia	<b>;</b>			booth room 18'x32' with
:				: 12 booths 3'9"x3'3",and
River.:	•			: C.O.room, 7'x9'6".
;	:			:Reinforced concrete
;				: structure with asphaltum
•	•		•	: and gravel roof. Not com
:	•		•	: spicuous at 4 miles in
;	:			: usual channel of ap-
				: proach.
;		•	•	<del>-</del>
	:Combined primary			:Ref.of site 67'.
:	station for first:			Ref. of Inst.axis 69.085
;	fire command and	Mar.30.1911:	\$ 2,130.00	One room 15' x 15'.
	Battery Commander:		The second of the second of the	:Reinforced concrete
	station, Battery			structure. Not conspic-
	:David Russell:			uous at 4 miles in
	:F', and B.C.	i setatikan Setatikan		usual channel of ap-
~ 1	(Dāvid Russell)			proach.
	Primary station			Ref. of site 25'.
	for second fire	Oct.4 1904.	\$ 7.572.98	Ref. of Inst. axis 73'.
	command.			Lower room 15'3/4"x15'3/4
	F'2. and			Upper room 8'4"x8'4".
				Concrete column and
	Meteorological Station.			steel tower. Conspicuous
				at 4 miles in usual chan-
				nel of approach. Growth
				of trees in time can be
				made to render it very
	- 1			much less conspicuous.
	Combined primary			Ref. of site 20'.
,	station for third	Mar.30 1911	\$ 8.072.68	Ref. of Inst. axis 72'.
	fire command and		" - 3-7M-00	Six rooms:
	Battery Commander		•	observing room 14'x16'.
	etation Rottorn	and the second s		three unfinished rooms:
	Clark; F'3& B.C.			officers' dormitory 25'x
	(Clark).			with lavatory;
	,			men's dormitory 28'x30'
		garasi ay		with lavatory.
				Wood frame building
			• •	covered outside with
				corrugated iron, with
:				: corrugated from, with : reinforced concrete
			ν •	instrument pier. Not
			<b>.</b>	conspicuous at 4 miles
	; '			in usual channel of
•	•		;	approach.
			*	

Note .- Plane of reference of all stations refers to mean lower low water.

	Name of Station	Date when turned over to the	Total Cost	Remarks.
Harbor		: Artillery	<u> </u>	•
	: :Secondary Station :second fire command	Mar.30,1911	:\$1.050.00	Ref. of site 95'. Ref. of Inst. axis 98'.
of	: <b>F"</b> 2·	<b>:</b>		:One room 12'x12' :Reinforced concrete
Colum- bia	•		• •	structure. Not con- spicuous at 4 miles in usual channel of
River.		:	<b>:</b> <b>:</b>	: approach.
	Secondary Station third fire command	: :Mar.30,1911	:\$1.050.00	:Ref. of wite 95'. :Ref. of Inst. axis 98'.
	.F*8.	<b>.</b>		:One room 12*x12*. :Reinforced concrete
	:	and Agrees	**************************************	: structure. Hot con- : spicuous at 4 miles : in usual channel of
		* Company of the Comp		: approach.
	Combined Supplementary Stations of	.Mov.9,1911.	:\$5.496.29	:Ref.of site 15.00'. :Ref.of Inst.axis 40.00'
	:Second and Third :Fire Commands,	A Commence		:Wood frame structure :covered with corrugated :iron, with asphaltum
	PHIR and S. T. Committee	i. Na rođije 1918		:roof; two concrete :instrument piers.
				: 4 rooms, two 10'x10' :observation rooms on :top floor; 10'x20'
	:			:dormitory,2d floor, :and 10'x20" dormitory
	1			:belew. Not conspicu- :ous at 4 miles in usual
	· Salar Salar			channel of approach.
	:Primary Station, :Battery David Rus-	Mar.30,1911	\$1,050.00	:Ref.of site 95'. :Ref.of Inst.axis 98'. :One room 12'x12'.
	:sell, :B*1(David Russell)	***		:Reinforced concrete : structure. Not con-
		The second secon		: spicuous at 4 miles : in usual channel of : approach.
				•
	:Primary Station, and B.C.Station,	Hov.29,1900	\$2,729.00	:Ref.of site 54.65'. :Ref.of Inst.axis 60'. :One room 14'm14'.
	:Battery Mishler :B*g(Mishler) & B.C.			:Concrete structure; :steel roof. Conspicu-
	:	:		cons et 4 miles in cusual channel of ap- cproach.
	•			*
	and the second of the second o			

:		Date when:		
Name :	Name of Station.	turned	Total cost	Remarks.
of :	Mame of preston.	over to the		•
Harbor:		: Artillery	:	
Har Dor.		•	•	
3543	Daimons Station	• • 1	:	Ref. of site 20.00
Mouth:	Primary Station	San 13 1904	\$ 7.844.57	Ref. of Inst. axis 72'.
:		. Dob. 10, 110-		
of:	B'z(Walker)	<b>*</b>		Inner room 8'4"x8'4".
:		:	•	: Concrete column and
Colum-		:	<b>:</b>	steel tower.
bia :		•	;	Speet nower.
		1	:	Not conspicuous at
River.:	<b>i</b>	•	:	4 miles in usual
	•	:		channel of approach.
		•		<b>1</b>
:			•	•
		•		Ref. of site 23.00'.
	Primary Station	:		Ref. of Inst. axis 73'.
	Battery Lewis,	:Sep.13,1904	1,002.20	Lower room 15 2 x15 2".
	B'A(Lewis)	:	:	:Upper room 8'4"x8'4".
	4.20.		:	Opper room o 4 20 2
		•		Concrete column and
	•		:	steel tower.
			in. La∰agoria de la calenda de la c	Not conspicuous at
	• Company of the Comp	Philip al Ma		• 4 miles in usual
	\$ 0.00 miles	e stylener i	u.≛ + <b>2</b> to 1 a a a a set a a a	channel of approach.
	· ************************************	istorija ist sijan		
	•		•	
	The second of th	a 🛊 a sala sa a Abelia Abelia Abelia	e je 🛊 • roze e • roze e e roze (1907)	:Ref.of site 10.00
	: Secondary Station	· •		7:Ref. of Inst.axis 40.00'
	: Battery Russell	Nov. 9.191	1:\$ 2,717.5	7:Ref.of Inst.axis 40.00
	Bactery Musserr			:Wood frame structure
	: B" <sub>1</sub> (Russell)	*	√ •	covered with corrugated
	•	.•	·•	iron; asphaltum gravel
	:	. •		roof; concrete instru-
	:		· •	ment pier;
	•	<u>.</u> :	•	Three rooms:
	•	•		Aleini abservation
	:	•	*	room above; one 13'x13
		•	:	on second floor, and
	•	•	:	on second liver, and
			:	one 16'x16' with lava-
	And the second of the second o			tory on ground floor.
	. <b></b>	a Bernar 1994	도 하루에 가는 1942의 444 P	<b>:</b>
	T: The second way as the second	<del>-</del>		•
	•		•	Ref. of site 95'.
	Secondary Station	1 :	1 AEA 7 AEA 6	Oc. Ref. of Inst.axis 98'.
	: Battery Lyman	:Mar.30,19.	TT:# T'090.	One room 12'x12'.
	. Mighler			: Reinforced concrete
	B"2(Lyman Mishler	c):	<b>:</b>	: Reiniurged Concrete
	D S/Hamon	The agency	•	structure.
		Salah Sa		Not conspicuous at
		•		4 miles in usual
		All the second of the second		channel of approach.
	1. A	•		
		:		
	•	. (j <b>.:</b>		
	-	- · ·	· . •	<b>7</b>
	•	4 · •	4:	<b></b>
	•	- 1 · 1 · ₹ - 1 · 1 · • •	: :	<b>:</b>
	•		•	•
	•	•	•	
	•	•		<b>.</b>
		•		▼

		8		
		en grand de la companya de la compa La companya de la co		
Name of	Name of Station	: Date when : turned : over to the	Total cost	Remarks.
Harbor	•	: Artillery	<u>:</u>	
	:Battery Commander's :Station, Battery :Lewis, B.C.(Lewis)	: :Nov.9,1911.	:\$ 3,398.67	Ref. of site 32.751. Ref. of Inst. axis 35.201. Reinforced concrete
Colum- bia	: : :	:	<b>.</b>	structure: two rooms: observation room (upper) observation room (upper) observation room; observation rooms; observations observations
River.	•	• •	:	at 4 miles in usual channel of approach.
	: Battery Walker.		:\$ 3,448.18;	Ref. of site 32.75'. Ref. of Inst. exis 35.15'. Reinforced concrete
	:B.C.(Walker).			structure. Two rooms: cobservation room (upper) 15' x 15'; plotting (lower)15'x15'.
		i Barrio i Bull La Salario i La Salario de Calendario	t en terrore en	Not conspicuous at 4 miles in usual channel of approach.
	: Battery Commander's: Station, Battery Mishler			(See B'2 (Mishler) sheet 6)
	B.C. (Mishler) see B'g (Mishler)			
	Battery Commander's: Station, Battery Clark. B.C.(Clark) (see F'3)			(See F'3 sheet 5)
	Battery Commander's Station, Battery David Russell.	likasi sikyitya ba Na	igeria , de associa	(See F <sup>1</sup> 1 sheet 5)
	B.C.(David Russell)			
	Primary Station, first mine command:	Mar.30,1911	\$ 5,660.80:	Ref. of site 13'. Ref. of Inst.axis 50'. Four rooms: Observing
•	en de la companya de La companya de la co			room, 17'8"x17'8"; plotting room; 17'8" x 17'8", with two
•			\$\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	telephone booths 4'x3'3" each; officers' dormitory 17'8"x17'8", with lavatory 3'6"x7'6",
			; ;	two telephone booths 4'x3'3" each, and hallway; men's dormi- tory, 40'x18', with lavatory 7'6"x14'6".
:				TOVORATA 1. D. TTE. D.
	· · · · · · · · · · · · · · · · · · ·			

Name : of : Harbor:	the state of the s	Date when turned over to the Artillery	Total cost	Remarks.
Mouth : of : Colum-: bia : River.	Primary Station first mine command M <sup>†</sup> 1 (continued)			Wood frame building covered with corrugated iron, with reinforced concrete instrument pier. Not conspicuous at 4 miles in usual channel of approach.
	Secondary Station first mine command M"1	Mar.30,1911	\$ 1,510.56	Ref.of site 53'. Ref.of Inst.axis 55.45' One room 12'x12'. Reinforced concrete structure. Not con- spicuous at 4 miles in usual channel of approach.
	Combined Switchboard Room and Plotting room for third fire command Swb. and P			Three rooms: operating room 16*x20', with 6' basement; storage battery room 5'x20', with 6' basement; plotting room 19'x20', Reinforced concrete structure.
	Mine Loading Room and service dyna- mite room.	Mar.30,1911	\$ 4,910.00	Loading room; one room 45'x21'7", with testing tank 35'x 7'. Service dynamite room 8' x 10'. Both buildings wood frame on reinforced concrete platform.
•	1 Mining Casemate 1 Mine Store- house 1 Mine Store- house Extension 2 Cable Tanks	:Apr.30,1901 :Sep.22,1909	\$ 8,148.75 \$ 5,244.40	
	l Cable Tank Cover l Terminal Manhole	:Sep.22.1909	: \$ 2.935.34	:In good condition.

#### Tide Gages.

There is one Artillery tide gage at Fort Stevens, located on the jetty tramway 4,660 feet out from the root of the jetty. It is a staff gage without any house and was established and turned over to the Artillery in November, 1906. Its cost was \$5.00. Is serviceable. A tide gage, originally located on the Engineer dock at Fort Stevens, has been moved to the Quartermaster dock. This gage is of the disk type, protected by a wooden house. Approximate cost \$200.00. Transferred to the Artillery May, 1908.

	in the second of	10 54	e og 100 til til en gæri. Søgte og skalte til	
			ide Multiple geligie Kalender	
Name:	Name of Station.	Date when turned over to the	Total Cost	Remarks.
Harbor:		Artillery.		
Mouth:		Nov. 9,1911	•	Concrete structure with asphaltum gravel roof. Three rooms: operating
of : Colum-		•	•	:room 12'x16', with lava-
bia :	•	:	<b>:</b>	generator room 8 x 10 .
	Dormitory at Battle Commander's	Nov. 9,1911	<b>\$</b> 7,680.93	: Wood frame structure :covered with expanded :metal and plaster;
	Station, C.	• 10 + 10 + 10 + 10 + 10 + 10 + 10 + 10		asphaltum gravel roof; Two rooms: Officers'; dormitory 12'x32',
				with lavatory; men's dormitory 32'x46', with lavatory.
	: Combined			: Frame structure covered
	Plotting Room and Dormitory for Second Fire Com-	Nov. 9,1911	\$ 8,356.16	: Frame structure covered: with diamond mesh and :plaster; asphaltum :gravel roof.
· -	mand, F'2 & Plotting Roc Batteries Mishler Lewis, Walker.		e Transporter (1995) Service (1995) Service (1995)	: Three rooms: :plotting room 18'x25', :with 4 telephone booths :officers' dormitory :10'x25', with lavatory; :men's dormitory 25'x64'
	<b>:</b>		•	:with lavatory.
	Dormitory for Primary Stations B'3 and B'4 Batteries Lewis and Walker.	Nov.9,1911	.:\$ 1,396.3 :	Wood frame structure with diamond mesh and plaster sides, and asphaltum gravel roof. one room 12'x10' with lavatory.
	: · · · · · · · · · · · · · · · · · · ·			: With Tayaboly.
	The second secon			
			•	
	· <b>:</b> • · · · · · · · · · · · · · · · · · · ·			• •

#### CENTRAL POWER PLANT.

(Supplying current to all batteries except Battery Russell.)

The plant is located in a reinforced concrete building 250 feet from right flank of Battery Clerk.

Boilers: Two 100 H.P., horizontal, water-tube, oil burning, manufactured by E. Keeler & Co., Williamsport, Pa., date of purchase July 8, 1909.

Engines: Two 70 H.P., horizontal, single cylinder, center crank, non-condensing, with fly-wheel governor, 305 R.P.M., steam, direct connected to generators, Manufactured by Buffalo Forge Co., Buffalo, N. Y. Date of purchase June 3, 1909.

Generators: Two 50 k.w., 220 volts no load, 250 volts full load multi-polar, compound wound, direct connected. Manufactured by the Western Electric Co., Chicago, Ill.

Transformers: None.

Storage Batteries: None.

This plant furnishes current for lighting and power in the following emplacements and buildings:

Batteries: Mishler, Walker, Lewis, Pratt, Freeman, Smur and Clark.

and for lighting all fire and mine control buildings, except F"2 & 3, the mine loading room and service dynamite room, and those located in the vicinity of Battery Russell.

No current supplied for Searchlights.

Kilowatts required for power and lighting:

Inside	illumination,		24.1	K.W.
Outside			4.9	
Motors,	shot hoists,	4.0000	21.6	#
17	powder hoists,	٠	21.0	
Ħ	retracting.		24.0	. **
Switchb	oard Room, power	klight	2.0	**
			97.6	•

\*Includes 2 retracting motors at Battery Mishler not yet installed.

The plant includes one 50 k.w., direct connected generating set and balancer set for Post Lighting.

The plant allows for the installation of one additional 100 H.P. boiler.

Total cost of plant, exclusive of conduit lines and underground cables, \$34,013.00.

Transferred to the Artillery, December 15, 1910.

#### ELECTRIC PLANT AT BATTERY DAVID RUSSELL.

The plant is located on the right flank of the battery, in a concrete structure having three rooms: engine room 15' x 21'; radiator room 15' x 11'; and storeroom 10' x 32'. The structure was originally designed for and occupied by steam plant, which was transferred to the Artillery August 12, 1904. Steam plant has been dismantled. Cost of structure is indeterminate, as it was built in connection with the battery.

The new plant consists of two 25 k.w. direct connected sets. as follows:

Two 4-cycle, 4-cylinder, vertical gasoline engines, type G.M.12 A-2, 43/54 H.P., 560 R.P.M., Nos. 6790 and 6792, direct connected to two Type M.P.C., class 6-25-560, Form A., 230-V., direct current generators Nos. 195141 and 195415, respectively, manufactured by General Electric Co., Schnectady, N.Y. Purchased in 1910. No transform No transformers or storage batteries.

Generators furnish current for lighting and power to the following

emplacements and buildings:

Emplacements Nos. 1 and 2, Battery David Russell; R. F. stations C, B'1, B"2, F"3, F"2, F'1, District Signal Station and Dormitory at Fire Control Hill. No current is supplied for post lighting or searchlights. or searchlights.

Kilowattage required for power and lighting:

```
Inside illumination, - - - - - - - - - 10.2 K.W. Outside

Motors, shot hoists, - - - - - - - - 7.0 "

powder hoists, - - - - - - - 7.0 "

retracting, - - - - - - - - 12.0 "

Motor Generator Set, Signal Station, - - 2.0 "
```

No provision has been made for additional parallel units.

The cost of the plant, including alterations of power house, was \$9,930. Transferred to the Artillery, March 30, 1911.

#### ELECTRIC PLANT FOR SEARCHLIGHTS NOS. 1 and 2. Fort Stevens, Oregon.

The plant is located near the southwest end of the reservation, approximately 1500 feet southeast of Battery David Russell, and is housed in a fireproof, steel frame building, covered with expanded

metal and plaster.

The plant consists of two 25 k.w. direct connected sets, as follows: two 4-cycle, vertical, gasoline engines, type G.M.12-A2- 43/54 H.P., 560 R.P.M., Nos. 5514 and 5515, direct connected to two type M.P.C., class 6-25-560, Form A., 115-volt, direct current generators Nos. 195129 and 195122, respectively. Manufactured by General Electric Co., Schenectady, N.Y. Purchased in 1910. No transformers or storage batteries.

Generators furnish current for two 60" projectors only. Kilowattage required: two 60" searchlights at 20 k.w. each, 40 k.w.

No provision made for additional parallel units. The cost of the plant was approximately \$10,430.00. Transferred to the Artillery on July 28, 1911.

#### ELECTRIC PLANT FOR SEARCHLIGHTS NOS. 3 and 4. Fort Stevens, Oregon.

The plant is located 200 yards west of northeast corner of reservation, in a fireproof, steel frame building covered with expanded metal and plastered.

The plant consists of 1 - 25 k.w. direct connected set, as follows: one 4-cycle, vertical, gasoline engine, type G.M.-12, A-1-43/54 H.P., 560 R.P.M., No. 5512, direct connected to one type M.P.C., class 6-25-560, Form A., 115-volt, direct current generator No.195130. Purchased in 1910. Manufactured by General Electric Company.

transformers or storage batteries. Generator furnishes current for one 60" projector and for lights for torpedo loading room only. Kilowattage required: 1 - 60" searchlight, 20 k.w., inside illumination of Torpedo Loading Room, .7 k.w., and inside illumination of Power Plant, .7 k.w.; total, 21.4 k.w.

Provision has been made for installing similar 25 k.w.set for

furnishing current for 36" searchlight No. 4.

The cost of the plant was approximately as follows: Power House \$3,920; Machinery \$3,630. Transferred to the Artillery on March 7, 1912.

#### ELECTRIC PLANT FOR 30" SEARCHLIGHT. Fort Stevens, Oregon.

The plant is located on the northeast end of reservation approximately 1000 feet west from Quartermaster Dock and is housed in a wood frame building covered with corrugated sheet steel; which also serves

as a shelter for the searchlight.

The plant consists of 1 20 h.p. vertical fire tube boiler, serial #3300, manufactured by the Lidgerwood Mfg. Co.; and 1 direct connected marine type generating set, manufactured by the General Electric Co., Schenectady, N.Y.: steam engine, 18 brake h.p. approximately, single cylinder, 62 bore x 5 stroke, 450 R.P.M., form A., serial No.402; 10-k.w. generator, 110 volts no load and full load, 91 amp., 4 pole, compound wound, form A., serial No.13269, class 4-10-405. No trans-This plant furnishes current for formers or storage batteries. lighting the power plant and for 30" searchlight No.283. No current supplied for post lighting or telautographs. Kilewattage required for power and lighting: 1 - 30" searchlight 8.8 k.w.; inside illumination 2" total and 10 to 1 nation .3, total 9.1 k.w.

No provision is made for the installation of parallel units. Cost This plant was transferred from Willets Point in of plant not known.

1898, together with the searchlight.

Transferred to the Artillery, March, 1901.

#### SEARCHLIGHT PROJECTOR NO. 1.

by General Electric Co., Schenectady, N.Y. Purchased in 1910. Electrically controlled. Current supplied from power plant above described. Projector is fixed and installed in a frame, sheet-iron covered shelter near south end of reservation at Fort Stevens. Returns made to the Engineer Department. Cost of projector, \$5.512; of shelter, cable, etc., \$1,100. Transferred to the Artillery on July 28,1911. A Controller Booth for this light on high ground is located approximately 170 ft. in rear (east) and 60 feet to the right (north) of the center of the light. Built in October, 1914. Cost \$145.00. Transferred to the Artillery Dec. 4, 1914.

#### SHARCHLIGHT PROJECTOR NO. 2.

60" - serial Ho.8225, type EC. form N-2. Class 60", manufactured by General Electric Co., Schenectady, N.Y. Purchased in 1910. Electrically controlled. Current supplied from power plant above described. Projector is fixed and installed in a frame, sheet-iron covered shelter near south end of reservation at Fort Stevens. Returns made to the Engineer Department. Cost of projector. \$5.212; of shelter cable, etc., \$1.100. Transferred to the Artillery on July 28, 1911.

#### SKARCHLICHT PROJECTOR NO. 3.

60" - serial No.8222, type EC, form N-2, class 60", manufactured by General Electric Co., Schenectady, N.Y. Purchased in 1910. Electrically controlled. Current supplied from 1 - 25 k.w. gasoline actuated generator set in power plant #3 and 4 described above.

Projector is mounted in a specially designed corrugated iron shelter, 100 yards north of power plant, equipped with a hoisting apparatus to elevate light to required height. Returns made to the Engineer Department. Cost of Projector. \$5.312; cost of shelter, \$2.225.

Transferred to the Artillery on Merch 7, 1912.

#### SEARCELIGHT PROJECTOR NO. 4.

To be 36", under approved project. (Not supplied).

#### SHARCHLIGHT PROJECTOR. 80".

50" - serial No.283, type E.J.F., electric control, manufactured by General Electric Co., Schenectady, N.T. Purchased in 1898 and shipped from Willets Point, N.Y., July, 1898. Current supplied from 50" searchlight electric plant described above. Mounted on car with a track connecting with Columbia River jetty railway, and hes sufficient cable to be moved 1000 feet. Returns made to the Engineer Department, Transferred to the Artillery in March, 1901.

## 36" PORTABLE SEARCHLIGHT, FORT STEVERS, OREGON.

Searchlight #3045.- Portable outfit So. 24, as described in the 4th supplement to mimeograph #39. Manufactured by General Electric Co.. Schenectady, N.Y. Type E.C., form M, 130 amp., D.L.41418, electric con-

Engine. #3905. 3-sylinder. 6" x 6". 4-cycle, gasoline, 600 R.F.M. Generator. #114889, multipole, differentially wound, separately excited, 74 volts, no load. 9.6 k.w., 130 amp., type M.P.6, form C. Exciter #145918, 110 volts.

Outfit purchased in 1907 and shipped from Fort Totten, October 5, 1907. Used in connection with submarine mine defense, and housed in wood frame building covered with corrugated sheet steel, located approximately 200 feet south of mining casemate. Returns made to Engineer Department. Cost not known.

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Transferred to Artillery, January, 1908.

Name		Date when turned	; ; m_+-~	: :	Remarks.
of :	of Battery.	over to	Total	cost;	UAMST.YS ◆
arbor:		Artillery.	;		
			<b>:</b>	:	Commission
fouth	Fort Columbia, Wn.	•	:	:	Garrisoned.
:		•	:		Magazines dry.
of	: Battery Jules Ord.		•	•	Battery rewired,
	: Mounted:	•	•	•	interior and exterior
Colum-	3-8" B.L.Rifles, Model	•	:		in 1910. Current sup-
018	:1888, Nos. 20, MI, 23 MI, and 44 MII., Watervliet	•	•		nlied from Battery
Kiver	:Arsenal.	•	:	;	Jules Ord Power Plant
	: Wiscust.	•	:		
	3-8" disappearing car-	•	:		
	riages, L.F., Model 18	96,	•		Taylor-Raymond shot
					hoists installed All
	:Machine Tool Co. &	:Jul.16,1898	:\$137,2	98.79	back delivery. Serial Nos.:
	:No.32 Lake Erie Engi-	:	:		Emp.#1 - No.2.
	:neer Works.	:	:		2 - " 1.
	:	:			. " 3 - " 3.
	:Emp.1,Rifle 20,Car. 1	The second secon			. Motor: Voltage 110:
	" 2, " 23, " 10 " 3, " 44, " 32	Albre snon	•		:Speed 1060: capacity
	: " 3, " 44, " 32	•	•		:3-1/2 H.P.
	🧲 i de la companya di Santa d	A skiller i jevi i i			: Transferred to Ar-
	· ·		•		:tillery March, 1908.
		•	•		•
	Battery William Murphy	•	:		: Magazines dry.
	Mounted:		:		: Battery rewired; in-
	2-6" B.L. Rifles, Model		:		:terior & exterior,19
	:1897, Nos.15 & 24, MI,	; · . •	.:		: The current is sup-
	:Watervliet Arsenal.	:	:		:plied by a duplicate
		<b>:</b>	:		oil engine plant, one located in Emp.
	:2-6" disappearing car-	• :	•		:No.1 and one in Emp.
	riages, L.F., Model	: T 00 700		9% R9	No.2. They may be
	:1898, Nos. 9 and 10,	:Jen.29,190	ų <b>, φυ</b> ο , υ	20.00	Gouneared III baration
	:Watervliet Arsenal.		•		or each run separate
	The Piero 15 Con	<b>.</b> 9 •	• •		·lv. Three 3" Emps.
	Emp.1, Rifle 15, Car. 5				:also served from thi
			•		:plant.
	. The state of th	::	:		: Hodges type hand
	•	:			:hoist installed,
		September 1			: Back delivery. : No serial number or
					: No serial number of the choist. Hand operated
		•	•		: HOISt. Hand Operation
			·		: Magazine dry.
	:Battery Frank Crensha	<b>Mi</b>	• •		Battery rewired; inte
	: Mounted:		•		ior & exterior, 1911
	:3-3" R.F.guns. Model :1898,MI, Nos.97,98 &				: Served from dupli-
	:104, Driggs-Seabury	•	. ·		:cate plant in two 6'
	:Co.	•	•		:emplacements.
		2 -			<b>:</b>
	:3-3" Non-Disappearing	Jun.28,190	0:\$15,4	162.6	1:
	mounts, Nos. 97, 98 & 10	4: 1 -	• :		
	:Driggs-Seabury Co.	:Oct.29,190	0:		:
		•	g. <b>:</b> 3. j.d		<b>,\$</b> .
•	:Emp.1, Gun 97, Car.9	7:	:		•
	: " 2, " 98, " 9	8:	- 1		•
	: " 3, " 104, " 10	<b>4:</b>	:		•
	The second secon	•	•		<b>:</b>

Name of	Name of Station.	: Date when : turned		Remarks.
Harbor		over to the		4
HAT DOT	<u> </u>	: Artillery.		
	Primary Station :fifth fire com-	Nov. 29 1900	\$ 7 666 00	: :Ref.of site 327.45'. :Ref.of Inst.axis 329.0'.
	mand.	,	. w 1,000.00	: One room 14'x14'.
	Fis	•	•	: Concrete structure:
Colum-	- r	• •	•	steel roof. Not con-
bia	•			:spicuous at one mile.
River				in usual channel.
		:		:
:	Battery Commander	<sup>1</sup> ន		:Ref. of site 107.5'
;	Station, Battery Ord,	Nov.20,1911:	\$ 3,096.16	:Ref. of Inst.axis 109.08'
	Battery Ord,	•		:Reinforced concrete
. :	: B.C.(Ord)			:structure; two rooms,
3				:observation (upper)
				:room 15'x15';plotting :room (lower) 15'x15'.
	•		,	:room (lower) lb'xlb'.
•	• •			:Not conspicuous at 4 :miles in usual channel
9	e e e e e e e e e e e e e e e e e e e	marine arrows a sign of asset and a second		of approach.
				· or approach.
	Primary Station	៖ មិនពីស្នើម៉	No sa lide la sine	:Ref.of site 326'.
:	second mine com-		\$ 2.025.00	:Ref. of Inst.axis 328.97'
•	mand. M'2.	Berthamper in Alle	Control of the Control of the State of the S	: Two rooms: observing
, :	·		· !	:room 18'x18';plotting
:		ing and the second of the seco		room 18'x18'; with two
:				telephone booths,
:	· · · · · · · · · · · · · · · · · · ·	•		:519"x3'3".
•				Reinforced concrete
•				building. Not con-
•				spicuous at 4 miles in usual channel of approach.
:				
:	Mining Casemate	Mar.301911	\$ 5,005.00	: Four rooms: cot room
:				:8'10"x21'10":operating
:		:	and the second	room 15'9"x21'10"; engine room 11'8"x21'10"; storage
:	j je sa kalandari kaj kala			room 11'8"x21'10"; storage
:				battery room 10'x21'10".
				Wood frame building
•				covered with expanded
			:	metal and plaster.
	Mining Casemate :	Apr.30.1901:	\$ 7.885.00	This mining casemate
•				has been abandoned as
;	and the second s	in Nachada e la la la 🖠		such.
		الله الله المواقعة على المعادلات العلم المواقعة العلم العادلات	en en g	en en significa
<b>:</b> ,	Switchboard Room:	Mar.30,1911:	\$ 3,430.00	Two rooms: operating
:	•	•		room 16'x20', with 5'
:	•	1.600		basement; storage battery
:	•			room 5'x20'.
:		:		Wood frame building
•				covered with expanded
•			•	metal and plastered.

Note.- Plane of reference of all stations refers to mean lower low water.

Name : of : Harbor:	Name of Station	Date when turned to the Artillery.	Total cost	Remarks.
of : Colum-:	Dermitory for primary station of second mine command and for station of fifth fire command.	:Mar.30,1911:	\$ 2,290.00	Four rooms: officers' dormitory 9'6"x17'; officers'lavatory 6'x6'; men's dormitory 33'x17'; men's lavatory 10'6"x6'. Wood frame building covered with expanded metal and plastered.

#### Tide Gages.

There is one Artillery tide gage for Fort Columbia, established at Desdemona Light Station and turned over to the Artillery in August, 1905. It is a staff gage without any house, and its cost was \$15.00. Is serviceable.

A tide gage has been constructed on the Quartermaster's wharf at Fort Columbia, of the disk type, protected by a small wooden house, as recommended by 3rd Supplement to Mimeograph No.62, Serial No.314. Its cost was approximately \$200.00, and was turned over to the Artillery in May, 1908. Also used for Meteorological station.

Arms Capania

The Company of the Wilson Telephone of Telephone (1997) and the Company of the Co

graduated for a finding the party of the contract of

#### CENTRAL POWER PLANT, FORT COLUMBIA, WASHINGTON.

The plant is located near the left flank of emplacement No. 3, Battery Jules Ord, in a concrete structure, 29 ft. x 32 ft., having two rooms; radiator room 12 ft. x 16 ft., and engine and work room occupying the remainder of the space. The structure was originally designed for the installation of a steam plant, but instead, a Hornsby-Akroyd oil engine and generator were installed. During the years 1909-1910, provision was made for the installation of two 25-k.w. gasoline actuated generating sets, one of which was installed at that time. 1911 the Hornsby-Akroyd oil engine and generator were removed and provision was made for the installation of one 25-k.w. generating set to furnish power for the operation of Searchlight No. 9. In the early part of 1916 a reserve 25-k.w. generating set and cables connecting with Battery Murphy, were installed.

The present plant consists of two 25-k.w. direct connected sets

as follows:

Set No. 1 consists of one 4-cycle, 4-cylinder, vertical gasoline engine, type G.M., 12-A2-43/54 H.P., 560 R.P.M., No. 5372, direct connected to one type M.P.C., 115-volt, class 6, 25-k.w. direct current generator, No. 183184, manufactured by the General Electric Co., pur-

chased in 1909. Transferred to the Artillery, February 10, 1911.

Set No. 2 consists of one 4-cycle, 4-cylinder, vertical gasoline engine, type G.M., 12-A2-43/54 H.P., 560 R.P.M., No. 10965, direct connected to one type M.P.C., 115-volt, class 6, 25- k.w. direct current generator, No. 448814, manufactured by the General Electric Co., purchased in 1915. Transferred to the Artillery, April 6, 1916.

Generators furnish current for lighting and power for batteries Ord, Murphy, and Crenshaw, stations F'5 and M'2, Switchboard Room, Dormitory for F'5 and M'2, and Post Lighting. No current is supplied for searchlights.

Kilowattage required for power and lighting:

Inside illumination - - - - - - 1.0 Post Lighting - - - - - - -

The cost of the plant, exclusive of the structure, is as follows:

Installation of No. 1 set and provision for installation of reserve set - - - - - \$5,175.00 Provisions for installation of 25-k.w. set for S. L. No. 9 1,565.00 Installation of No. 2 set - - 3,745.00 Installation of cables connecting with Battery Murphy - -

TERY JULES ORD.

ELECTRIC PLANT AT BATTERY JULES ORD.

The plant is located in a consrete structure near the left flank of emplacement No. 3 of Battery Jules Ord. The structure was originally designed for the installation of a steam plant and contained two rooms an engine and dynamo room 11' x 32' and a boiler room 16' x 32'.

Instead of a steam plant, a 16 k.p. Hornsby-Akroyd oil engine, purchased in September, 1898, was installed in the engine room. This engine was belt connected to a Westinghouse direct current, multipolar, compound generator, 11-1/4 k.w., 150 volt capacity, installed in the engine room.

A storage battery, type F-11, capacity 50 amperes, number of cells in lead lined tanks, made by Electric Storage Battery Co., Phila-

58, in lead lined tanks, made by Electric Storage Battery Co., Philadelphia, Pa., purchased in Octoberm 1898, was installed in emplacement No. 2 of the battery.

During the years 1909-1910, the following set was installed in the

During the years 1909-1910, the following set was installed in the boiler room: one 4-cycle, 4-cylinder, vertical gasoline engine, type G.M. A2-43/54, No.5372, 550 R.P.M., direct connected to one 25 k.w. generator, 115-volt, multipolar, type M.P.C., class 6, 25 k.w., Form A, No. 183184, direct current, Manufactured by the General Electric Co. Purchased in July, 1909. No transformers. Transferred to the Artillery on February 10, 1911. Provision was made for a duplicate 25 k.w. gesoline actuated generating set in the same room.

gasoline actuated generating set in the same room.

During the year 1911, the Hornsby-Akroyd engine and 11-1/4 k.w. generator were removed, the partition between the engine and boiler rooms was removed, and provision made for the installation of one 25 k.w. gasoline actuated generating set to furnish power for the operation

of Searchlight No. 9.

The generator furnishes current for lighting emplacements Nos. 1
2 and 3 of Battery Jules Ord, and for power for the shot hoists; also
current for lighting stations F'5, M'2, B.C. (Ord), Dormitory and Switchboard Room. No current is supplied for searchlights, but current is

supplied for Post Lighting.

Kilowattage required for inside illumination 1.00; for ourside illumination of defensive works 6.70; for interior motors 10.00; for switchboard room 1.00, and for Post Lighting approximately 2.8.

Cost of the old plant, including storage
battery, was about, - - - - - \$6,950.00
Cost of installation of present generating set and provision for installation
of 25 k.w. duplicate set. - - - 5,175.00
Cost of removing partition and making
provision for 25 k.w. set for S.L.#9, - - 1,565.00

## ELECTRIC PLANT AT BATTERY WILLIAM MURPHY.

The plant is located in the emplacement rooms of Battery William Murphy. There are no boilers in use.

Two (2) 7 H.P., Hornsby-Akroyd oil engines. Date of Purchase, May

Two (2) 4 K.W., 110 volt, direct current, bi-polar, compound wound, belted generators, made by the General Electric Company. Date of purchase May, 1900. (This is a duplicate plant, which can be run singly or in parallel.)

No transformers used. No storage battery installed. This plant furnishes current for lights in Battery William Murphy

This plant furnishes current for lights in Battery William Murphy and Battery Frank Crenshaw, and is intended only for these two batteries.

No motors have been supplied for the chain hoists in Battery William Murphy, but this plant is amply large for all known light or power requirements.

No Post lighting is done from this plant, and no searchlights

are operated from it.

The current requirements from this electric plant will be as follows: (1) For inside and outside illumination of defensive works,  $3\frac{1}{2}$  k.w.; (2) For motors, 4 k.w.

Cost of this duplicate plant, about \$4,100.00. Date of transfer to the Artillery, October 29, 1900.

ELECTRIC PLANT FOR 30-INCH SEARCHLIGHT, FORT COLUMBIA, WASH.

A 15 k.w. generator, belt driven, and a Hornsby-Akroyd oil engine shipped from the Coast Defenses of San Francisco, May 14, 1914, have been installed in place of the direct current, marine type generating set formerly in use.

Location: The plant is located in the southwest end of the reservation, approximately 500 feet west of Battery William Murphy, and is housed in a wood frame building covered with corrugated sheet steel. The interior is ceiled.

Engine: 25 h.p. Hornsby-Akroyd, oil, serial No. 2748. Date of purchase, May 20, 1902.

Generator: 15 k.w., 125-volt, direct current, four pole compound wound, belt driven, Westinghouse, No. 96640. Date of purchase, May 20, 1902.

Transformers and Storage Batteries: None.

This plant furnishes current for lighting the power plant and for operating the 30-inch Searchlight, No. 261.

Provision has been made for this plant to relieve the electric plant at Battery Jules Ord in case of an emergency.

Kilowatts required for power and lighting:

1 - 30-inch searchlight - - - 8.8 Inside illumination - - - - - 59.1

No provision has been made for the installation of parallel units. Cost of plant not known.

Transferred to Artillery, August, 1914.

#### Searchlight Projector.

30-inch, serial No.261, type E.C.F., electrical control.

Manufactured by the General Electric Co., Schenectady, N. Y., purchased in 1898 and shipped from Willetts Point, N.Y., July 19, 1898.

Current supplied from 30-inch searchlight plant described above.

Searchlight mounted on truck and is movable within 1,000 feet radius.

Cost not known. Returns made to Engineer Department.

Transferred to Artillery, March, 1901.

Name of Harbor	Name of Armament of Battery.	Date when turned over to the Artillery.	Total cost	Remarks.
Mouth	Fort Canby, Wash.			: Garrisoned.
of	: Battery Harvey Allen: : Mounted:	•		: :
bia	3-6" R.F. Guns, Model 1905, Nos. 13,17 and 16, Watervliet Arsenal.			
:	3-6" disappearing car- riages, L.F., Model 1903, Nos. 86,87 and 88, South Bethlehem.	Feb.27,1906		: : : :Magazines dry.
	Emp.1, Rifle 13, Car. 86 "2, "17, "87 "3, "16, "88			:Emplacements fully :wired. Electrical :current supplied :from Central Power :Plant.
:	Battery Elijah O'Flyng. Mounted: 2-6" R.F. Guns, Model 1905, Nos. 1 and 11, Watervliet Arsenal:	To what a service of the control of		The cost does not include mounting carriages. No shot hoists installed.
	2-6" disappearing car- riages, L.F., Model 1903 Nos. 84 and 85, South Bethlehem.	Feb.27,1906	\$39 <b>,290.</b> 00	• • • • • • • • • • • • • • • • • • •
	Emp. 1, Rifle 1, Car. 84			•

		a Aspril	
NT	: Date when	:	•
Name : Name of Station	: turned	•	
- <del>-</del> •	:over to the	.Total cost	Remarks.
Harbor:	: Artillery.	•	i iomorno.
•	•	<del>:</del>	
Mouth: Primary Station		•	a David and a state of the stat
Of :Of Bourth Pire		•	:Ref. of site 295 ft.
Colum -: Command	:Nov.6,1911	. 44 740 60	:Ref. of Inst. axis 296'.
bia : Batteries Allen	1770110,1011	· ₩4, /49.09	:Three rooms: observing
River.: and O'Flyng,	•		:room 10'x10':officers;
:F'4 (Canby)	•		:dormitory.with lavatory
ž (samo)	•		LU'XI6': men's dormitore
•	•		:22'6"X26' including five
			: Telephone booths and
•	•		:Lavatory.
•	•	•	Observation roomconcrete
•			dormitories, wood frame
•			covered with diamond mesh
•		;	and plastered, asphaltum
	:		and gravel roof. Not con-
· · · · · · · · · · · · · · · · · · ·	:		spicuous at 4 miles in
•	:		usual channel of approach.
	:		e and onamer or approach.
: Primary Station,			Ref. of site 222'.
:Battery Harvey	:Nov.6,1911.:	\$1,020.58	Ref. of Inst. axis 223'.
:Allen, B'5(Allen)		,	Wood frame covered with
:	Product Designation	and the second second of	diamond mach and mith
		· · · · · · · · · · · · · · · · · · ·	diamond mesh and plaster,
•		,	asphaltum and gravel
			roof. One room 10'x10'
•			observation. Not con-
•			spicuous at 4 miles in
• <u>• • • • • • • • • • • • • • • • • • </u>			usual channel of approach.
:Switchboard Room :	Nov.6.1917 ·	\$2 636 35	Wood frame structure
		,000.00	"ood frame structure
;	•		covered with diamond mesh
	•		and plaster, with asphal-
:			tum and gravel roof. Two
:	•		rooms, storage battery
•	•	*	room b'x19'6" with coment
	•	•	floor and frosted windows;
_	•		operating room 16'x19'6".
Dormitory for B'5	Nov.6.1917 :	u	
:		, via. 10 :	Wood frame covered with
:		ī	alamond mesh and nleeter
		•	asphaltum and gravel roof.
g 🖟 💮 🖟 🖟 🖟 🖟 🖟 🖟		•	UWU FUOMS Officers 140mm4
		•	OFY IO'XIX' With laws-
			UIV: And men's downstand
		•	15'7"x18', with lavatory.
•			· · · · · · · · · · · · · · · · · · ·

#### Tide Gages.

A tide gage has been constructed on the dock at Fort Canby, of the disc type, protected by a small wooden house, as recommended by 3rd Supplement to Mimeograph No. 62, Serial No. 314. Its cost was approximately \$155.00, and was turned over to the Artillery in August, 1908.

#### CENTRAL POWER PLANT, FORT CANBY, WASH.

The plant is located in a concrete building (15' x 24') in the ravine between batteries Harvey Allen and Elijah O'Flyng, about 30 feet west of the Signal Corps Switchboard Room.

The plant consists of two 25 k.w. direct connected sets. The

description of each set follows:

Set No. 1 consists of one 4-cycle, vertical, gasoline engine, type G.E. 12-A2-43/54 H.P., 560 R.P.M., No.5538, direct connected to one type N.P.C., class 6-25-560, Form A., 230-Volt, direct current generator No. 189033. Purchased in 1910.

Set No. 2 consists of one 4-cycle, vertical, gasoline engine, type G.E., 12-A2-43/54 H.P., 560 R.P.M., No. 6879, direct connected to one type N.P.C., class 6-25-560, Form A, 220-Volt, direct current generator No. 368929. Purchased in 1912.

Both sets were manufactured by the General Electric Company.

No transformers or storage batteries.

These generators furnish power for the lighting systems of batteries Harvey Allen and Elijah O'Flyng, for range finding stations F'4 and B'5, and dormitory of each, and for the Signal Corps switchboard room.

#### Power Required:

```
Battery Allen, outside illumination, - 1.8 k.w. Battery Allen, inside illumination, - 3.2 "
Battery O'Flyng, outside illumination- 1.2 "
Battery O'Flyng, inside illumination- 2.2 "
Range Finding Station F'4 & dormitory- 1.0 "
Range Finding Station B'5 -- -- 2 "
Dormitory for Station B'5 -- -- 5 "
Signal Corps Switchboard Room -- -- 1.0 "
11.1 "
```

No current is furnished for ammunition service, maneuvering of guns, post lighting, or for searchlights.

No provision has been made for the installation of additional parallel units.

The cost of the plant is as follows:

Power House and installation set No. 1 - \$8,886.00 Installation of reserve (No.2) set - - 200.00 Machinery (estimated) - - - - - - - 7,500.00

Transferred to the Artillery on November 26, 1912.

# ELECTRIC PLANT FOR SEARCHLIGHTS NOS. 6 and 7, Fort Canby, Wash.

The plant is located on McKenzie Head at Fort Canby, Wash., in a fireproof, steel frame building covered with expanded metal and plastered. The plant consists of 2-25 k.w. direct connected sets, as follows: two 4-cycle, vertical, gasoline engines, type G.M.-12, A2-43/54 h.p., 560 R.P.M., Nos. 6845 and 6846, direct connected to two type M.P.C., class 6-25-560, Form A, 115-volt, direct current generators Nos.324513 and 324584, Manufactured by General Electric Company. Purchased in 1911.

No transformers or storage batteries.

Generators furnish current for one 60" and one 30" projector only.

Kilowattage required: 1 - 60", 20 k.w. and 1 - 30" searchlight, 8.8 k.w.,
inside illumination .7 k.w.; total, 29.5 k.w.

No provision has been made for additional parallel units. The cost of the plant is approximately as follows: Power House \$5,400; Machinery, \$7,360. Transferred to the Artillery March 7,1912.

#### ELECTRIC PLANT FOR SEARCHLIGHT NO. 8, Fort Canby, Wash.

The plant is located on the southeast point of Fort Canby reservation in a fireproof, steel frame building covered with expanded metal

and plastered.

The plant consists of 1 - 25 k.w. direct connected set as follows: one 4-cycle, vertical, gasoline engine, type G.M. 1-12, A-1-43/54 h.p., 560 R.P.?., No. 5513, direct connected to one type M.P.C., class 6-25-560, Form A, 115-volt, direct current generator No. 195123, manufactured by General Electric Company, Schenectady, N.Y. Purchased in 1910. by General Electric Company, Schenectady, N.Y. Purchased in 1910. Generator furnishes current for one 30" projector only. Kilowattage required: 1 - 30" searchlight 8.8 k.w., inside illumination .6 k.w., total, 9.4 k.w. No provision is made for additional unit. The cost of plant is approximately as follows: Power House, \$3,450; Machinery, \$3,500. Transferred to the Artillery on March 7, 1912.

#### SEARCHLIGHT, PROJECTOR NO. 6.

30" - serial No. 269, type ECF., class 30", electrically controlled, manufactured by General Electric Co., Schenectady, N.Y., transferred to this District from Seattle District by authority of 1st indorsement dated Office Chief of Engineers, April 13, 1911 (E.D. 38971/116.Def. 721/ 192.) Date of purchase not known. Current supplied from power plant above described. Projector is fixed and installed in a frame, sheetiron covered shelter on McKenzie Head. Projector has controller booth located on high point about 1/3 mile northwest of McKenzie Head. Returns made to Engineer Department. Cost of projector, not known; cost of shelter and booth, about \$850. Transferred to Artillery on March 7, 1912. (Temporary installation- E.D.68858/121--Def.721/172).

## SEARCHLIGHT PROJECTOR NO. 7.

60" - serial No. 8223, type EC, form N-2, class 60", electrical control, manufactured by the General Electric Co., Schenectady, N.Y. Purchased in 1910. Current supplied from power plant described above. Projector is fixed and installed in a frame, sheet-iron covered shelter on McKenzie Head about 360 feet southeast of light. Returns made to Engineer Department. Cost of projector, \$5312. Cost of shelter and Engineer Beat about \$850. Transferred to the Artillery on March 7, 1912.

### SEARCHLIGHT PROJECTOR NO. 8.

30" - serial No. 332, type ECF, class 30", electrical control, manufactured by General Electric Company, Schenectady, N.Y., transferred to this district from Seattle District by authority of 1st indorsement dated Office Chief of Engineers, April 13, 1911. (E.D.38971/116). ment dated of purchase not known. Current supplied from one 25 k.w. gasoline actuated generator set in power plant No. 8 described above. Projector is fixed and installed in a frame, sheet-iron covered shelter at extreme southern point of Fort Canby reservation. Returns made to the Engineer Department. Cost of projector, not known; cost of shelter, about \$775. Transferred to the Artillery on March 7, 1912. (Temporary installation E.D. 68858/121.)

# DATUM POINTS

Name :		: Date When : turned	• • • • • • •	
of :	Datum Point.	over to the		Remarks.
Harbor:		: Artillery.	<u> </u>	:
Wouth :		: :Aug. ,1905	\$ 27.00	: On Desdemona Light Station: Visible from Forts Steven
of:				:Columbia and Canby.
Colum-: bia : River.:		Aug. ,1905	\$150.00	:On dolphin located 8487.6 :feet south, and 26,863.32 :feet east from Cape Disap
:				:pointment Light, visible :from Forts Stevens, Colum- :bia and Canby.
:	One Datum Point No. 3.	Aug. ,1905	\$125.00	: On dolphin back of Sand :Island,located 1,574.51 :feet south, and 11,908.12
:				:feet east from Cape Dis- :appointment Light, visible :from Forts Stevens, Colum- :bia, and Canby.
:	One Datum Point M.R. Stevens	Nov. 9,1911	<b>\$ 20.00</b>	: Six- foot target, elevation 20 feet, on south side of south jetty 2 miles from Fort Stevens
	One Datum Point S.R. Stevens	Nov. 9,1911	\$20.00	Six-foot target, elevation 20 feet, on south side of south jetty 1 mile from Ft.Stevens.
	One Datum Point M.R. Columbia	Nov. 9,1911	\$ 19,50	: Six-foot target, elevation 20 feet, on north side of south jetty. la miles from Ft. Stevens.
	One Datum Point S.R. Canby	Nov.26,1915	\$ 25.00	Six-foot target, Dlevation of center line 20 feet above M.L.L.W., at Bent 428, North Jetty, S.2506' W.6561' from Canby Light.
:	One Datum Point M.R. Canby	Dec. 9,1915	\$ 25.00	: Six-foot target, :elevation of center line :20 feet above M.L.L.W., :at Bent 1574 South Jetty.
•				S.15619' E 370' from Canby Light.