MONITORING WELL-REHABILITATION PROGRAM
UNITED STATES NAVY
BETHPAGE, NEW YORK

WORKPLAN

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INTRODUCTION

This plan describes the scope for the work activities necessary to rehabilitate a recently installed monitoring well associated with the United States Navy site in Bethpage, New York (the Site). The well screen appears to have failed and the objective of the rehabilitation program is to replace / line the compromised screen.

SCOPE OF WORK

Existing Well
UTD installed Well BPOW 4-1 at the TOH Water District 13 area on the Site. The well is constructed with 4-inch Schedule 80 PVC ASTM F480 flushthread materials. The internal diameter (i.d.) of the well is 3.786 inches with 40 feet of 010 slot screen set from 652 to 692 feet below grade (ft bg). The casing is set from 652 ft bg to grade and the annular materials are #1 Morie well gravel, #00 Morie "choker" sand and bentonite grout.

The well screen has apparently failed. The cause of the failure of the PVC screen is unknown, however the well is blocked with sand at approximately 660 ft bg. The top 8 feet of well screen is apparently clear.

Proposed Repair
UTD will install 40-feet of 3-inch outside diameter (o.d.) stainless steel well screen in the screened interval of the well (652 to 692 ft bg).

To facilitate the repair, UTD will drill out the sand / obstruction observed at 660 ft bg with a 3.5-inch o.d. bit using mud-rotary drilling technique. If the well screen was completely severed during installation, UTD anticipates that a significant portion of the lower 32 feet of screen will be drilled out. If the screen collapsed / ruptured due to hydrostatic pressure exerted by the formation, UTD anticipates to remove the sand that has migrated into the well. Following drilling, UTD will lower the screen into the re-drilled cavity. The bottom of the screen will be fit with a point to aid in navigating past any pieces of broken casing. The top of the screen will be fit with 5-feet of stainless steel riser and a rubber packer to seal the telescoping screen to the inside of the PVC casing. A right-left threaded socket will be affixed to the top of the packer to allow for removal of the well screen from the placement rods. Following placement of the screen into the well, the well will be redeveloped to remove any mud introduced to the formation.

Finished Product
The final product will be a 4-inch Schedule 80 PVC well (grade to 652 ft bg) x 3-inch Stainless Steel (652 to 692 ft bg) telescope well.

SMALL DIAMETER FREE-FLOW™ WELL SCREENS

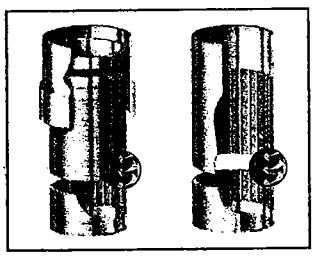
Waterwell and Environmental - W60 Construction - 304 and 316 Stainless Steel

Size	OD in	Clear ID in	Wire Width in	Screen Wt/Ft* lbs	Max Depth ft	Tensile Strength lbs (1)	Recom. Hang Wt. lbs (2)	Column Strength lbs (3)	Open Area - sq. in. / ft-screen Collapse Strength - PSI (4) Screen Slot Size in thousandths of an inch						
									7	10	12	20	30	40	50
1-1/4P	1.7	1.1	0.060	1.8	1000	4200	2100	3100	6.9 *5,901*	9.4 *5,648*	10.9 *5,491*	16.4 *4,942*	21.9 *4,393*	26.2 *3,954*	29.8 *3,594*
2P **	2.5	1.9	0.060	1.9	1000	2000	1000	1500	9.7 *2,094*	13.3 *2,004*	15.5 *1,948*	23.3 *1,754*	31.0 *1,559*	37.2 *1,403*	42.3 *1,275*
2P/3T	2.6	2.0	0.060	2.2	1000	3400	1700	2600	10.1 *1,883*	13.8 *1,802*	16.1 *1,752*	24.1 *1,577*	32.2 *1,402*	38.6 *1,262*	43.9 *1,147*
2.5P	3.0	2.4	0.060	2.6	1000	4200	2100	3100	11.9 *1,164*	16.2 *1,114*	18.9 *1,083*	28.4 *975*	37.8 *867*	45.4 *780*	51.6 *709*
3P **	3.6	2.9	0.060	2.9	1000	4200	2100	3100	14.0 *713*	19.1 *682*	22.3 *663*	33.5 *597*	44.6 *531*	53.5 *478*	60.8 *434*
3P/4T	3.7	3.1	0.060	3.0	1000	4200	2100	3100	14.5 *635*	19.9 *608*	23.2 *591*	34.8 *532*	46.4 *473*	55.6 *426*	63.2 *387*
4P **	4.6	4.0	0.060	3.7	600	4800	2400	3700	17.9 *340*	24.5 *326*	28.6 *317*	42.9 *285*	57.2 *253*	68.6 *228*	78.0 *207*
4P/5T	4.7	4.1	0.060	3.8	600	4800	2400	3700	18.6 *307*	25.4 *294*	29.6 *286*	44.4 *257*	59.2 *229*	71.0 *206*	80.7 *187*
5P/6T	5.6	5.0	0.060	4.5	400	5600	2800	4200	22.1 *182*	30.2 *174*	35.2 *170*	52.9 *153*	70.5 *136*	84.6 *122*	96.1 *111*

Waterwell and Environmental - W90 Construction - 304 and 316 Stainless Steel

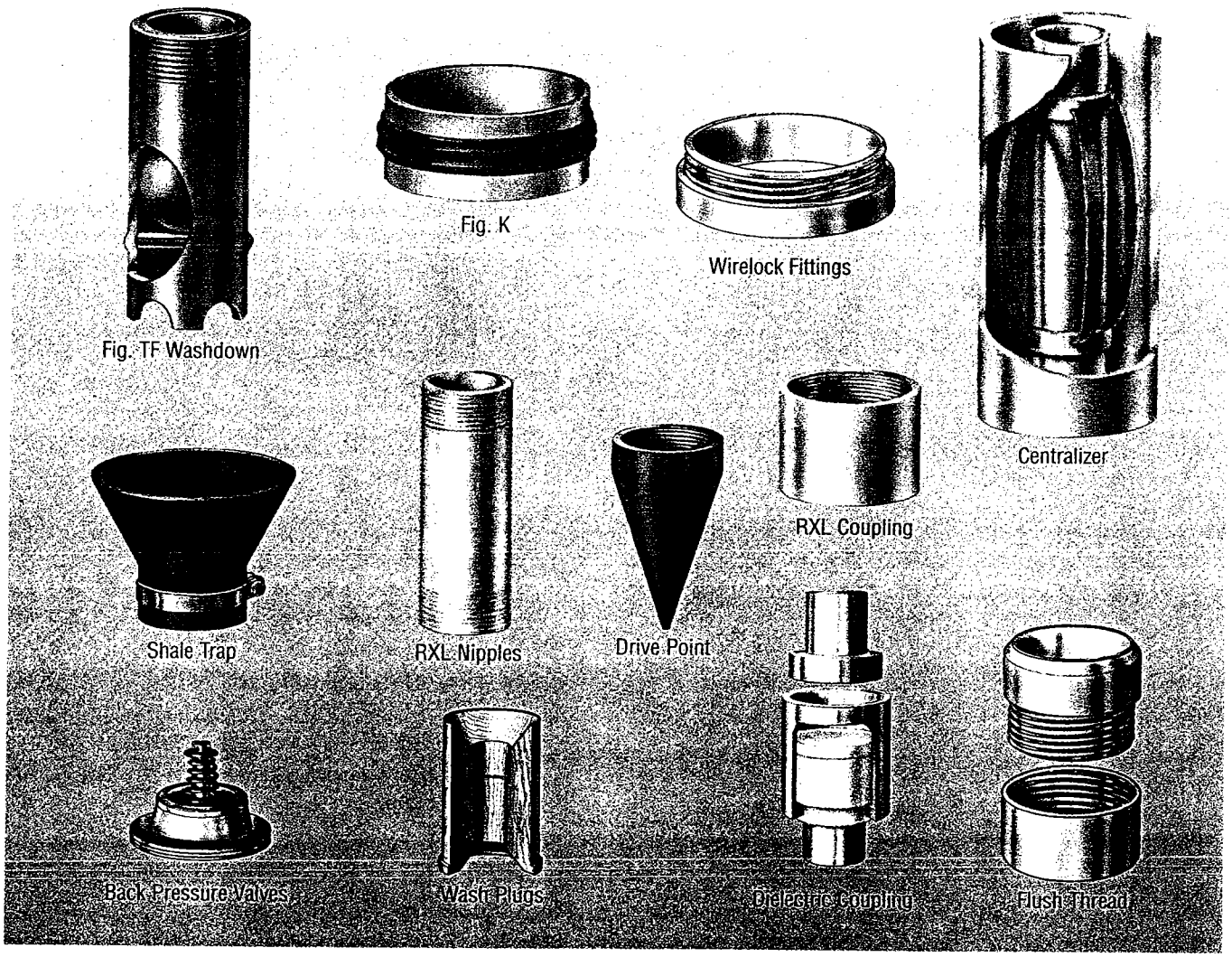
Size	OD in	Clear ID in	Wire Width in	Screen Wt/Ft* lbs	Max Depth ft	Tensile Strength lbs (1)	Recom. Hang Wt. lbs (2)	Column Strength lbs (3)	Open Area - sq. in. / ft-screen Collapse Strength - PSI (4) Screen Slot Size in thousandths of an inch						
									7	10	12	20	30	40	50
1-1/4P	1.7	1.1	0.089	1.5	600	4200	2100	3100	4.6 *2,343*	6.4 *2,272*	7.6 *2,227*	11.7 *2,063*	16.1 *1,890*	19.8 *1,743*	22.9 *1,618*
2P **	2.4	1.9	0.089	1.5	600	2000	1000	1500	6.6 817	9.2 792	10.8 776	16.7 719	22.9 659	28.2 608	32.7 564
2P/3T	2.5	2.0	0.089	1.7	600	3400	1700	2600	6.9 *724*	9.6 *702*	11.2 *688*	17.4 *637*	23.9 *584*	29.3 *538*	34.0 *500*
2.5P	3.0	2.4	0.089	2.1	600	4200	2100	3100	8.1 *443*	11.3 *429*	13.3 *421*	20.5 *390*	28.1 *357*	34.6 *330*	40.1 *306*
3P **	3.5	2.9	0.089	2.3	600	4200	2100	3100	9.6 *269*	13.3 *261*	15.7 *255*	24.2 *237*	33.3 *217*	40.9 *200*	47.5 *186*
3P/4T	3.7	3.1	0.089	2.4	600	4200	2100	3100	10.0 *239*	13.9 *232*	16.3 *227*	25.2 *211*	34.6 *193*	42.6 *178*	49.4 *165*
4P **	4.5	4.0	0.089	2.9	250	4800	2400	3700	12.4 *127*	17.1 *123*	20.2 *121*	31.1 *112*	42.8 *102*	52.6 *94*	61.0 *88*
4P/5T	4.7	4.1	0.089	3.0	250	4800	2400	3700	12.8 *114*	17.7 *111*	20.9 *109*	32.2 *101*	44.3 *92*	54.5 *85*	63.2 *79*
5P/6T	5.6	5.0	0.089	3.5	100	5600	2800	4200	15.3 *67*	21.2 *65*	24.9 *64*	38.5 *59*	52.8 *54*	65.0 *50*	75.4 *47*

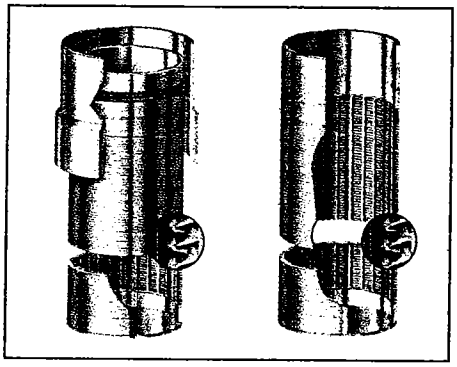
*Weight based on 10-slot construction (no fittings)
(1) Tensile and column strength includes 30% safety factor.
(2) Hang weight is 50% of calculated tensile strength.
(3) Column strength is based on 5-ft screen barrel length.
(4) Calculated collapse values - No safety factor
Transmitting Capacity in gpm/ft-screen = Open Area x 0.31
(assumes entrance velocity = 0.1 ft/sec.)
**Alternate Construction for Environmental Applications
P - Pipe Size
T - Telescope Size



Telescope size screens (left) install through the casing and usually have a Figure K packer as upper fitting. Pipe size screens (right) usually have weld rings at each end and attach directly to the casing.

FITTINGS





Most well screen installations involve a few standard fitting combinations. Telescope size screens, for example, typically use a Figure K packer on the screen top and a welded or threaded plate bottom. The plate usually has a welded bail attached for use when lowering the screen. Pipe size screens attach directly to the casing and usually have plate bottoms. A variety of other fittings such as centralizers, shale traps, washdown fittings and connecting fittings are stocked for quick delivery.