Item H10:

RFI #97 – Vibracompaction Refusal

Integraled Concepts and Research Corporation
421 West First Avenue, Suite 200
Anchorage, AK 99501
Office 907.561.4272 • Fax 907.561.4271

REQUEST FOR INFORMATION (RFI)

1. COMPANY NAME:	2. RFI NUMBER:	3. RFI SUBJECT:	4. DATE REQUESTED:
MKB Constructors	97	Vibrocompaction Refusal	June 14, 2009
5. DATE REQUIRED:	**6. SUBCONTRACT NUMBER:**	**7. PROJECT TITLE:**	
Immediate	3403-1-C170	Port of Anchorage Expansion	
8. SITE LOCATION: Wet barge Berth		**9. REQUESTED BY:** Andy Romine/MKB Project Manager	

10. DESCRIPTION OF REQUEST:

There have been a number of locations on the Wet Barge Berth where we have encountered significant resistance during the installation of the vibratory probes (in excess of 1 minute per foot) at 10 to 15' below grade. We are requesting that ICRC provide criteria for driving refusal at elevations above mud line. Attached is a current probe log that illustrates the issue.

☐ See attached.

11. ENGINEER RESPONSE AND ACKNOWLEDGMENT:

The probe logs provided to date do not show any consistent criteria has been followed when abandoning probing efforts. There will be no criteria set for refusal above mud line. Vibracompaction probes must reach the specified depth for the process to be effective. When areas that are difficult to penetrate are encountered, use one of the previously discussed methods for achieving penetration. Removal of the top layer of fill, pre-drilling through the top layer, saturating the probe locations with water, and removing the exterior angles from the vibraprobe are all possible methods for achieving penetration. Please install probes at the locations that were previously abandoned and are bubbled on the attached drawing. Single probes that were abandoned on the upper crust need not be repeated only the areas that had multiple unsuccessful probes in close proximity.

☐ See attached.

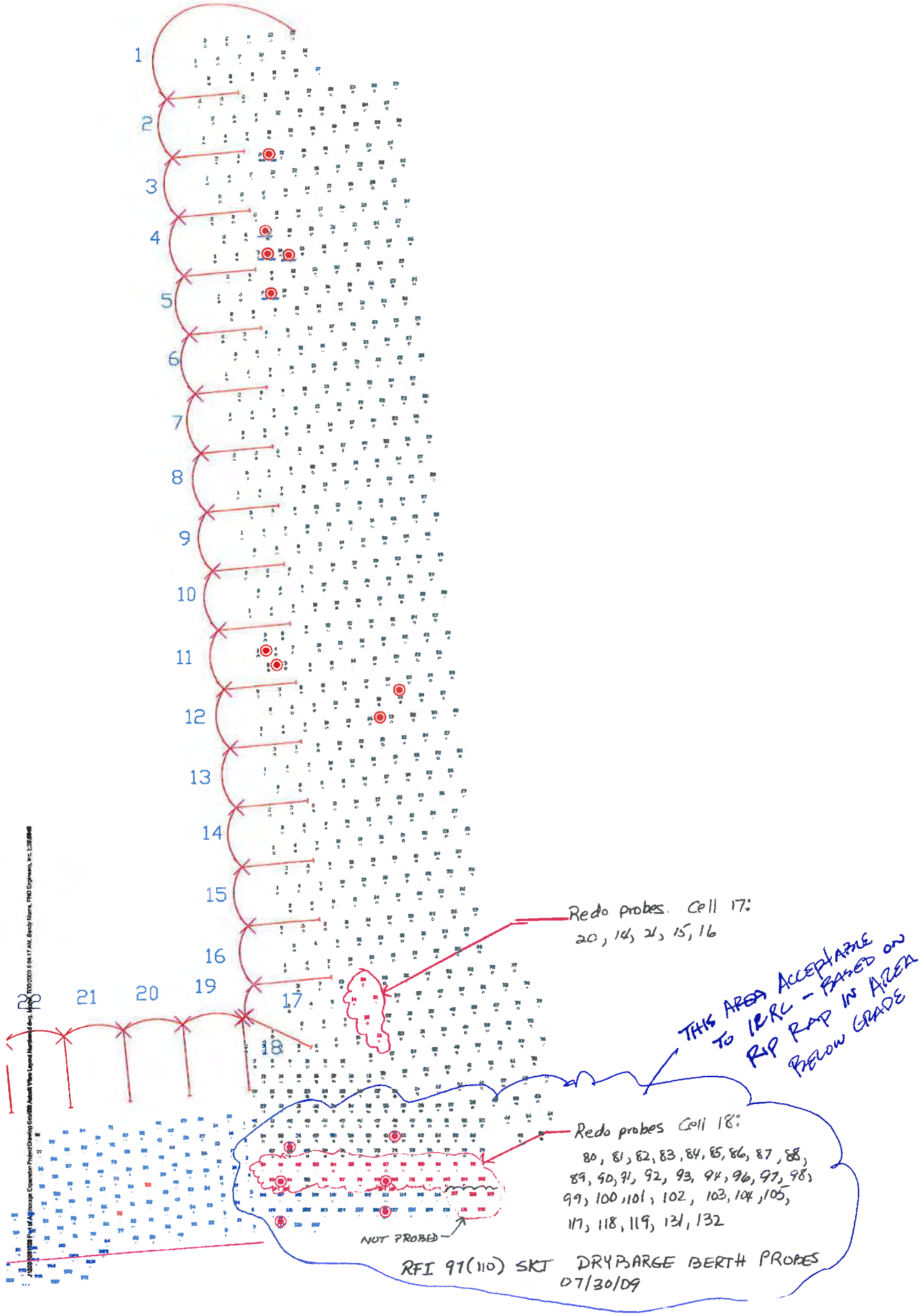
12. DISCIPLINE ENGINEER SIGNATURE:	13. TITLE:	14. DATE:
Kai Vedenoja	PND Staff Engineer	7/30/09

15. ICRC'S RESPONSE AND ACKNOWLEDGEMENT:

APPROX 30 PROBLES @ SE CORNER BB - BEHIND CELL 18 - ACCEPTABLE TO ABANDON DUE TO RIP RAP IN GRADE - CRAP TO CLEARLY INDICATE ON AS-BUILTS AS NOT VIBRACOMPACTED.

16. CONSTRUCTION ENGINEER/MANAGER SIGNATURE:	17. TITLE:	18. DATE:
19. ICRC'S REP/PROJECT MANAGER SIGNATURE:	**20. TITLE:**	**21. DATE:**
	PM	7/30/2009

NOTE: Subcontractor proceeds at his own risk without the written approval of ICRC.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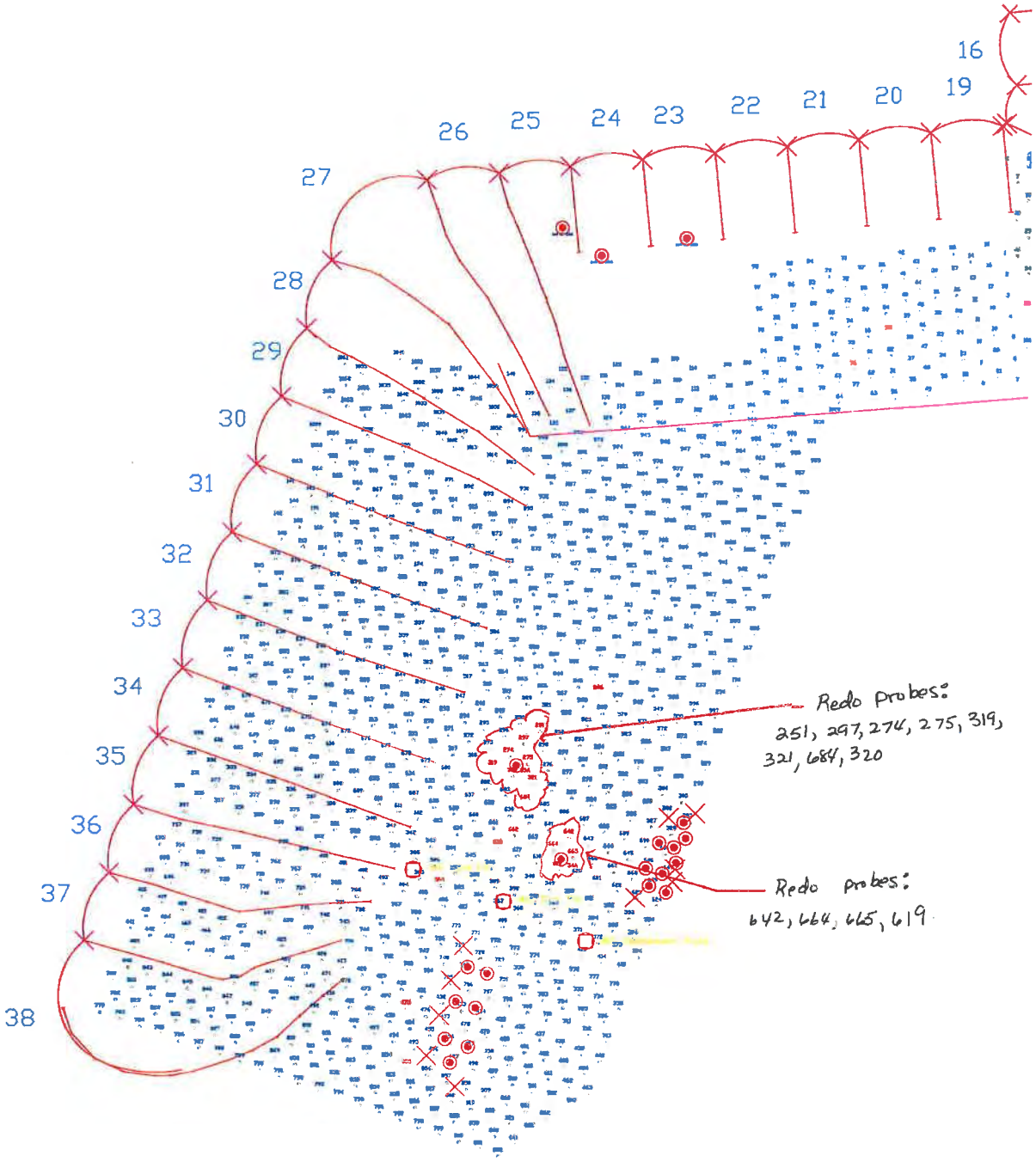
Redo probes Cell 17:
20, 14, 21, 15, 16
THIS AREA ACCEPTABLE TO IERL - BASED ON RIP RAP IN AREA BELOW GRADE
Redo probes Cell 18:
80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 117, 118, 119, 131, 132
NOT PROBED
RFI 97(110) SKJ DRYBARGE BERTH PROBES
07/30/09



RFI 97(110) SKT WET BARGE BERTH PROBES.
07/30/09

Port of Anchorage
Vibracompaction Data
Probes Installed 11/6-11/14

BB-296	6/13	2:35 PM	3:06 PM	0:31	35	-10	0:18:16	45	0:06:37	35	0:06:03	25		
BB-274	6/13	3:07 PM	3:21 PM	0:14	35	20	0:14:24	15						Refusal
BB-320	6/13	3:25 PM	3:33 PM	0:08	35	25	0:08:02	10						Refusal
BB-297	6/13	3:33 PM	3:57 PM	0:24	35	25	0:14:20	10						Refusal
BB-521	6/13	3:58 PM	4:29 PM	0:31	35	-10	0:16:31	45	0:08:43	35	0:06:02	25		
BB-251	6/13	4:30 PM	4:47 PM	0:17	35	25	0:16:37	10						Refusal
BB-275	6/13	4:48 PM	5:03 PM	0:15	35	20	0:15:20	15						Refusal
BB-321	6/13	5:04 PM	5:27 PM	0:23	35	25	0:14:00	10						Refusal
BB-658	6/13	5:33 PM	5:39 PM	0:06	35	-10	0:03:14	45	0:01:41	35	0:01:21	25		
BB-612	6/13	5:40 PM	5:48 PM	0:08	35	-10	0:03:36	45	0:02:37	35	0:01:50	25		
BB-635	6/13	5:50 PM	5:56 PM	0:06	35	-10	0:03:01	45	0:01:55	35	0:01:43	25		
BB-636	6/13	5:57 PM	6:06 PM	0:09	35	-10	0:03:22	45	0:02:25	35	0:01:48	25		
BB-681	6/13	6:06 PM	6:17 PM	0:11	35	-10	0:05:51	45	0:02:48	35	0:02:44	25		
BB-613	6/13	6:18 PM	6:24 PM	0:06	35	-10	0:02:28	45	0:01:30	35	0:01:32	25		
BB-659	6/13	6:25 PM	6:31 PM	0:06	35	-10	0:03:07	45	0:01:58	35	0:01:40	25		
BB-614	6/13	6:32 PM	6:51 PM	0:19	35	-10	0:08:17	45	0:04:19	35	0:05:19	25		
BB-344	6/13 & 6/14	12:30 AM	12:48 AM	0:18	35	-10	0:10:21	45	0:03:39	39	0:03:28	29		

Port of Anchorage
Vibracompaction Data
Probes Installed 11/6-11/14

Cell #	Probe #	Date	Start Time	Finish Time	Total Duration	Start Elevation	End Elevation	Cycle One		Cycle Two		Cycle Three		Gravel	Note
								Duration	Depth	Duration	Depth	Duration	Depth	CY	
	BB-592	6/4 & 6/11	12:08 PM	12:17 PM	0:09	35	-13	0:01:13	48	0:03:17	30	0:01:33	25		
	BB-229	6/11	12:18 PM	12:34 PM	0:16	35	-10	0:08:32	45	0:03:40	35	0:03:35	30		
	BB-207	6/11	12:35 PM	1:55 PM	1:20	35	-11	0:20:20	46	0:06:18	35	0:09:47	28		
	BB-185	6/11	1:57 PM	2:35 PM	0:38	35	-10	0:19:02	45	0:09:20	35	0:09:10	28		
	BB-208	6/11	2:36 PM	3:08 PM	0:30	35	-11	0:16:15	46	0:06:05	35	0:07:45	30		
	BB-230	6/11	3:09 PM	3:40 PM	0:31	35	-12	0:16:21	47	0:07:44	35	0:04:56	30		
	BB-593	6/11	3:41 PM	4:07 PM	0:26	35	-10	0:12:13	45	0:06:49	35	0:06:35	34		
	BB-548	6/11	4:16 PM	5:32 PM	1:16	35	-11	0:21:11	46	0:09:57	35	0:07:14	30		
	BB-570	6/11	5:37 PM	6:30 PM	0:53	35	-12	0:24:30	47	0:16:00	35	0:12:32	30		
	BB-571	6/11	6:31 PM	7:55 PM	1:24	35	-8	0:17:58	43	0:09:23	40	0:08:32	30		
	BB-549	6/11	7:57 PM	8:24 PM	0:27	35	-10	0:12:28	45	0:04:43	42	0:09:35	34		
	BB-594	6/11	8:26 PM	8:49 PM	0:23	35	-12	0:16:38	47	0:03:58	35	0:02:30	29		
	BB-231	6/11	8:50 PM	9:06 PM	0:16	35	-10	0:09:41	45	0:02:37	34	0:03:14	30		
	BB-186	6/11	9:07 PM	10:20 PM	1:13	35	-12	0:06:56	47	0:03:43	35	0:02:30	30		
	BB-209	6/11	10:21 PM	10:40 PM	0:19	35	-11	0:11:40	46	0:03:37	35	0:02:55	30		
	BB-187	6/11	10:42 PM	11:01 PM	0:19	35	-11	0:13:06	46	0:03:15	35	0:02:20	30		
	BB-210	6/11	11:04 PM	11:26 PM	0:22	35	-11	0:13:41	46	0:05:27	38	0:02:54	32		
	BB-188	6/11	11:30 PM	11:45 PM	0:15	35	-12	0:10:37	47	0:02:56	35	0:02:22	30		
	BB-232	6/11-6/12	11:46 PM	12:02 AM	0:16	35	-12	0:10:00	47	0:03:21	35	0:02:30	30		
	BB-595	6/12	12:04 AM	12:30 AM	0:26	35	-12	0:13:44	47	0:04:42	37	0:05:58	35		
	BB-550	6/12	12:31 AM	1:57 AM	1:26	35	-12	0:16:06	47	0:05:05	35	0:08:02	30		
	BB-572	6/12	1:57 AM	2:24 AM	0:27	35	-13	0:16:48	48	0:04:09	37	0:04:22	35		
	BB-573	6/12	2:25 AM	2:43 AM	0:18	35	-13	0:10:55	48	0:02:14	45	0:02:02	31		
	BB-574	6/12	2:47 AM	3:15 AM	0:28	35	-12	0:05:53	47	0:02:24	32	0:01:45	30		
	BB-551	6/12	3:17 AM	3:31 AM	0:14	35	-12	0:06:59	47	0:02:11	38	0:01:45	32		
	BB-596	6/12	3:31 AM	3:47 AM	0:16	35	-12	0:09:58	47	0:01:45	37	0:02:44	32		
	BB-233	6/12	3:47 AM	4:06 AM	0:19	35	-13	0:11:38	48	0:02:35	37	0:03:02	31		
	BB-189	6/12	4:06 AM	4:23 AM	0:17	35	-12	0:10:52	47	0:02:51	41	0:03:25	33		
	BB-211	6/12	4:26 AM	4:46 AM	0:20	35	-12	0:11:32	47	0:03:53	38	0:02:00	32		
	BB-212	6/12	4:48 AM	5:04 AM	0:16	35	-12	0:10:48	47	0:02:29	35	0:02:38	32		
	BB-190	6/12	5:05 AM	5:15 AM	0:10	35	-13	0:04:25	48	0:01:56	42	0:01:53	32		
	BB-234	6/12	5:16 AM	5:25 AM	0:09	35	-12	0:06:01	47	0:01:54	32	0:02:47	27		
	BB-597	6/12	5:27 AM	5:36 AM	0:09	35	-12	0:05:03	47	0:01:42	42	0:01:38	32		
	BB-552	6/12	5:37 AM	5:45 AM	0:08	35	-13	0:05:13	48	0:01:37	38	0:02:03	33		
	BB-517	6/12	6:02 AM	6:14 AM	0:12	35	-12	0:06:32	47	0:02:43	38	0:02:43	28		
	BB-247	6/12	6:15 AM	6:26 AM	0:11	35	-12	0:05:18	47	0:01:59	37	0:01:36	28		
	BB-294	6/12	6:27 AM	6:35 AM	0:08	35	-13	0:04:05	48	0:01:36	41	0:01:16	32		
	BB-271	6/12	6:37 AM	6:43 AM	0:06	35	-12	0:03:21	47	0:01:16	37	0:01:06	33		
	BB-317	6/12	6:44 AM	6:49 AM	0:05	35	-13	0:02:24	48	0:01:09	37	0:01:01	35		
	BB-680	6/12-6/13	6:50 AM	7:43 AM	0:53	35	-12	0:02:39	47	0:01:09	37	0:03:26	35		
	BB-518	6/13	9:31 AM	9:47 AM	0:16	35	-10	0:08:45	45	0:03:50	35	0:02:44	25		
	BB-248	6/13	9:50 AM	10:05 AM	0:15	35	-10	0:06:13	45	0:04:12	35	0:03:25	25		
	BB-272	6/13	10:16 AM	10:33 AM	0:17	35	-10	0:09:34	45	0:04:43	35	0:03:10	25		
	BB-318	6/13	10:34 AM	10:55 AM	0:21	35	-10	0:10:28	45	0:05:46	35	0:04:21	25		
	BB-319	6/13	10:56 AM	11:01 AM	0:05	35	25	0:03:24	10						Refusal
	BB-273	6/13	11:02 AM	11:35 AM	0:33	35	-10	0:18:07	45	0:07:29	35	0:07:40	25		
	BB-295	6/13	11:37 AM	11:54 AM	0:17	35	-10	0:08:20	45	0:05:14	35	0:03:18	25		
	BB-249	6/13	11:55 AM	12:12 PM	0:17	35	-10	0:09:20	45	0:04:26	35	0:03:40	25		
	BB-519	6/13	12:13 PM	12:37 PM	0:24	35	-10	0:12:05	45	0:05:55	35	0:05:24	25		
	BB-520	6/13	12:38 PM	1:09 PM	0:31	35	-10	0:18:14	45	0:05:51	35	0:06:21	25		
	BB-250	6/13	1:11 PM	2:32 PM	1:21	35	-10	0:18:29	45	0:09:36	35	0:05:02	25		

Item H11:

QAP Letter 094 Request for Suspension of Work

QAP

GENERAL CONTRACTORS

240 W. 68th Avenue, Anchorage, Alaska 99518

Telephone (907) 522-2211 Fax (907) 344-5798

June 19, 2009

VIA FAX (561-4271) AND EMAIL

John K. Williams
Construction Manager III
Subcontracts Representative,
Program Manager,
Purchase Office
ICRC – Anchorage Prot Expansion time
421 West Post Avenue
Anchorage, AK 99501

Re: Port of Anchorage Expansion Project
2008 Marine Terminal Redevelopment
Request for Suspension of Work Under General Condition 14.1.1
Letter No. 94

Gentlemen:

You have now been notified on several occasions of QAP's claim that there are differing site conditions, and existing design and specifications pursuant to which construction in accordance with the Plans and Specifications will not yield a product in conformance with the Contract Documents. QAP delivered to you separately this date its Notice of Intent to Assert Claim in its Letter No. 95.

The purpose of this letter is to provide you additional supporting documentation including empirical field data demonstrating soil movement pushing the dock faces of the cells out of tolerance. The soils near the plan elevation of minus 20 to minus 30 feet appear to be moving to the southwest based on our readings. On 6/8/2009, the data seemed to indicate that the soils above this elevation moved slightly to the west. However, in more recent readings, soils above this elevation actually appear to have movement toward the northeast. These observations may be consistent with a rotational type of slope failure, but there are other theories that could also account for the observed movement. Nevertheless, structural fill has been placed in strict accordance with the contract specifications and is creeping seaward.

Attached hereto are Shannon & Wilson's inclinometer test results presented in Figures 1 – 8 plotting the western and southern creep of materials over time

commencing June 5th, June 8th, June 11th, June 15th, and most recently on June 17th, 2009. The inclinometer results establish conclusively that the soils are continuing to creep in a westward and southward direction along the entire column, down to minus 110 plan elevation though, as indicated, the movement is most pronounced between minus 20 and minus 30, and is generally more pronounced above minus 20 than below minus 30.

The soil's movement results in wye piles and sheet piles driven at the plan location, to shift out of tolerance in the seaward direction. This excessive movement of the soils is not normal and was not predicted in the project's plans and specifications. No contractor can be expected or required to "guess" where to commence driving in order that unpredicted, abnormal soils movement might land the pile in its design location. The failure of the existing design to anticipate and account for this soil movement is a condition at the site different than that anticipated by the designer, and the existing design and specifications must be immediately modified in order to properly address that movement and account for it.

As it happens, QAP has now learned the westward movement of the soils on this project was anticipated and predicted by other engineers who peer reviewed the PND conceptual design. QAP has not yet had the opportunity study the peer review reports or determine what other existing studies may complement them. However, it was surprised to find the reports critical of the design, as having been based upon unjustified optimism about probable conditions throughout the project, when this optimism was based on incomplete geotechnical studies as to actual conditions. QAP expects that later geotechnical studies must have been performed to help fill these gaps. It is apparent, however, that whatever additional geotechnical work may have been done, it did not result in a disclosure in the Plans and Specifications that this movement would be encountered.

QAP urges ICRC to review, at a minimum, the following peer review studies of which it is aware, which suggest that the difficulties QAP is now encountering were not to be unexpected:

1. Port of Anchorage Potential Expansion Project/Open Cell Sheet Pile Design Concept/Independent Geotechnical Review by Lachel & Associates, by David R. Chapman, P.E. and Gabriel Fernandez, PhD., Geotechnical Engineer dated August 2002; and

2. Port of Anchorage Expansion Project/Review of Alternative Structural Concepts by Moffatt & Nichol Engineers, dated October 31, 2002.

ICRC should review these reports in conjunction with the attached inclinometer readings, so that it might act responsibly with respect to demands that QAP continue apparently futile efforts to obtain conforming results using defective plans and specifications in differing site conditions. QAP believes that it has demonstrated that under existing site conditions, following the plans and specifications as they presently

exist, will not yield a conforming result. Additional efforts to follow the existing plans and specifications will continue to lead to a nonconforming product. As noted in our Notice of Intent to Assert Claim filed simultaneously in Letter No. 95, QAP will look to ICRC for its damages for delay, performance costs, acceleration costs and all other costs connected with ICRC's orders to proceed without recognition of the differing site conditions, and, either acceptance of the predictably nonconforming product which will result from following existing plans and specifications, or alternatively, implementation of changes to the design, plans and specifications to obtain a conforming result.

QAP urges ICRC to immediately exercise its discretion under Paragraph 14.1.1 of the General Conditions to order a Work Suspension until it, and its Subconsultants can determine a solution which will result in a conforming product, or alternatively determine to accept the product which results from existing plans and specifications. Shannon & Wilson reports that approximately two additional weeks of inclinometer data will present a relatively clear picture of the speed, direction and extent of movement during both pile driving and static conditions, at all depths down to plan elevation minus 110. This geotechnical information is essential to the creation of an informed design solution to the continuing problems.

Continuing to follow the existing plans and specifications does nothing to mitigate the damages which are accruing, or protect ICRC and the Owner from increasing cost of claims.

As it has in the past, QAP stands ready, willing and able to be a cooperative constructive partner in reaching an acceptable solution to these continuing problems. Please feel free to contact us at our Post Road Port office at 865-5971 or by email at tdudley@colaska.com. Thank you.

Tom Pitt, Project Manager

Item H12:

ICRC Letter 047 Non conformance of OCSP® Installation

June 21, 2009,

ICRC Letter # 47

QAP General Contractors
Attention: Mr. Tim Dudley - Project Superintendent
240 West 68th Avenue
Anchorage, Alaska 99518

Infrastructure Support Services
421 West First Avenue
Suite 200
Anchorage, AK 99501
Tel: 907.561.4272
Fax: 907.561.4271

SUBJECT: Non conformance of OCSP installation
2008 Marine Terminal Redevelopment
Contract #4414-1-C170

Reference: QAP letter 90

Tim,

Please see ICRC responses in italicized bold to your letter 90.

QAP ltr90
ICRC's letter number 38 addressed both the soils movement issue, and the separate issue of hard driving. The letter claims that there is a non conformance of the sheet pile installation. QAP and our subcontor MKB has already instituted all reasonable suggestions that have been offered (installing extended tail walls, probing slope to provide densification, and moving the cranes back to their maximum reach limit). In addition to these suggestions, we have also implemented additional measures such as installing z-sheet piles in several different locations within our slope. Although the problem has been referred to as a "common phenomena," we disagree. The issue goes beyond this because no combination of the methods mentioned above has provided an adequate solution to the movement issue.

ICRC response
Based on survey data provided by QAP there are cell and wye installations that are significantly out of tolerance. QAP's attempts to implement various measures to correct the installation process appear to have been executed in a random, sporadic manner and it is difficult to see as to how a conclusion could be made as to the effectiveness of any of the measures. The entire sequence of installation was significantly altered as MKB appears to have instituted a piecemeal attempt at implementing corrective actions. The accuracy of deficiencies reported provided via RFI 86, dated 5/18/09 is in question due to the lack of contractor quality control and accurate survey control being utilized by QAP at that time. It now appears the extent of out of tolerance is not as severe as originally reported due to more accurate surveying efforts being performed by ICRC in absence of reliable information from QAP.

We are also concerned that it appears that QAP has not utilized their engineers, as required by contract, who designed the fill placement and pile driving plan to assist in developing a solution. We have repeatedly questioned QAP as to what their engineers have offered corrective actions for these issues, and believe they need to be involved in assisting QAP in understand the failures as well as providing a mitigation plan. Our engineers are more than willing to sit down with QAP's engineers to evaluate available information and to assist them in gaining an understanding of the issues and conditions.

Because we were not experiencing surface slope failure, it was reasonable to believe that the movement was occurring somewhere deeper within the structure. In fact. based on the independent investigation that QAP engaged Shannon & Wilson to perform-by installing inclinometers---we have now confirmed our original suspicions. A copy of the initial readings are enclosed with this letter. They reflect movement of the entire column of soils to the West and to the South, and particularly at 60 feet below backfilled grade level (i.e. minus 30' plan elevation). These results were obtained while minimal pile driving was occurring, so the soils movement could not have occurred as a result of those activities or the contractor's methods and means. The soils movement at these depths, which is continuing, and continuing to be monitored, demonstrate that the seaward movement of the cells out of tolerances is not attributable to the methods and means of performance we have been employing.

ICRC does not agree with QAP's assertion that there has not been surface failure; actually there has been significant evidence of surface slope failure near the top of the slope (See photos). Based on field observations at the time these photos were taken, it appears that shallow slope failure is at least a contributing factor in the observed movement. Significant discussions at the post bid pre award meeting revolved around QAP's ability to provide the pile drivers an adequate crane platform and what slope stabilization methods would be employed. QAP offer numerous options were being considered, including geotextiles s, Geo-bags, concrete mats and rip rap. It appears the failure to utilize an engineered system to provide a stable slope/crane pad is impacting the OCSP installation.

Furthermore, QAP disagrees that its QC program contributed to any of the current delays of the project. Factors such as marine mammal considerations have prompted delays, as well as the issues discussed herein. Our subcontractor's QC program has been routinely monitoring

the QC of the sheet pile installation and many additional monitoring methods have been added since the movement issues have taken precedence.

QAP is contractually responsible for the quality of Work installed under the contract, including work installed by QAP's sub-contractors. It does not appear that there is a QC system (see SGC 25) in place for OCSP to monitor installation and prevent deficiencies to date and failure to have a program as required by contract has contributed significantly to the extent of the current difficulties.

A partial list of QAP CQC program deficiencies per QAP's CQC plan are provided as illustration:

- ***No mention in QAP's QC plan on inspection of OCSP installation***
- ***No delay reports detail any qc inspection from QAP on OCSP installation***
- ***Larry Schmidt listed as QAP's QC systems manager has had no documented involvement with this project since mid year, 2008.***
- ***QAP indicated 6-10-09 Boone Daniels was going to be CQC rep for pile driving but has not been submitted nor provided any inspection reports***
- ***No activities or documentation of 3 phase inspections on OCSP.***
- ***No CQC documentation of non conforming work.***
- ***No pile driving reports as of June 18, 2009: ICRC has been requesting these reports since May 18, 2009 as required by contract.***
- ***QAP did not have a QC program in place for coating operation. Only after weeks of problems did QAP assign a QC inspector to provide QC on this these processes.***
- ***No submittal from QAP notifying ICRC of changes/additions to CQC staff -***

Repetitive deficiencies which required substantial effort from ICRC to correct;

- ***Coatings- significant number of sheets installed with no qc inspection to date***
- ***Driving face sheets without a template in place and lack of bracing when templates have been removed from cells continues to be a significant repetitive deficiency***
- ***Wye tolerance is consistently out of specified tolerance both in the east-west direction and the north-south direction***
- ***Material - sheets arriving bent and with damage, pairing of sheets methods, - many sheets with kinks, bends and interlock damage that potentially adds to iron binding during stabbing and difficult driving .***
- ***Plumb of face sheets and wyes is also out of specification***
- ***Inaccurate reporting and survey have forced ICRC to implement our own survey program and substantially increase Quality Assurance efforts.***

With respect to the hard driving issue, and the suspected potential damage to sheet piles already driven, we believe that this is due to Special Condition I52C which requires that the sheet piles first be driven with the vibratory hammer to final tip elevation or to refusal, prior to using an impact hammer. As previously pointed out, commencing driving with the vibratory hammer, causes liquefaction of the Bootleggers Cove Clay layer, and increases its impermeability to the point that the impact hammer cannot drive the sheets to tip elevation without tip damage. This is true despite employing the jetting technique which PND expressly recommended. On May 22, 2009 we requested a variance from SC I52C to permit initial driving with the impact hammer which would eliminate the increased impermeability from the vibration. See RFI No. 89. To date, this request has gone unanswered.

The conditions imposed by Special Condition 152 C are part of the contractual documentation and QAP has not demonstrated that there is changed condition justifying relief from this contractual condition. That assertion that use of the vibratory hammer is changing the density of the soils and increasing driving resistance is not consistent with known characteristics of the subsurface materials in the referenced location. It is well understood in the geotechnical engineering field that silt soils such as those making up the native site soils (i.e., "Bootlegger Cove Clay layer") do not liquefy and become more dense under these conditions because of their natural cohesion, high density and low hydraulic conductivity. In contrast, the dredged area trench fill and the dike fill materials, if consisting of relatively loose sand and gravel materials, could consolidate in response to pile driving and increase driving resistance. Alternative, more likely explanations for the difficult driving include: (1) naturally dense native soils, as noted in the bid documentation, (2) interlock friction due to differential pressure pushing on the sheets (e.g., fill material or tidal pressures pushing or from poor sheet alignment/restraint. Note that the extreme tidal fluctuation and high tidal currents were also pointed out in the bid documentation. In addition, Special Condition 152 C is a requirement of the Department of the Army Sections 10, and 144 Permit under the Clean Water Act and ICRC cannot offer relief under this condition without requesting and obtaining a modification to the referenced permit. Such a request would need to be based on definitive and conclusive scientific data.

With respect to both of the above conditions, QAP regards the root cause of the problems to be defective specifications and or differing site conditions for which we will be seeking additional time and compensation. Accordingly, in addition to the notices previously provided to you, please regard this as QAP's formal notice of differing site conditions pursuant to Paragraph 9.9.2 for which QAP is seeking an equitable adjustment and contract modification. In addition, or in the alternative, this will serve as QAP's notice under Paragraph 15.2.1 for which QAP is seeking additional compensation and performance time.

ICRC has not observed any site conditions that differ substantially from what was shown in the bid documents. ICRC is not aware of what alleged defective specifications that you are referring to. It is the Contractor's responsibility to notify us in writing of any questions, errors, inconsistencies, deficiencies, or problems regarding the project plans and specifications. Please provide detailed and specific information as to what parts of the specifications are defective and how QAP's performance is impacted. ICRC cannot adequately respond to a general assertion without appropriate detail and specific information.

We are also enclosing 3 separate letters of MKB, each dated June 5, 2009, which present MKB's views, shared by QAP, concerning the problems discussed above. You will note that MKB's letters were written without the benefit of Shannon & Wilson's inclinometer results. MKB's claims are pass through claims and intended to be included in those for which notice is given.

If ICRC persists in the directive made in its May 22, 2009 Letter No. 38 for QAP to remove and replace the wyes associated with cells 10/11 and 11112, QAP will be seeking a Change Order for additional compensation under Paragraph 9.3.6 of the General Conditions for this work.

Work found significantly out of tolerance will in all likelihood be found to be unacceptable and require replacement. The work installed under this contract is an initial step in the construction of new water front infrastructure and facilities. Conformance to the specified

tolerances is critical to prevent serious impacts to construction of following phases of work and the overall performance of the facility. However, ICRC has directed the design team to evaluate the situation to determine to what extent, if any, we can increase the tolerance without significantly increasing redesign and additional construction costs.

If ICRC persists in the directive made in its May 22, 2009 Letter No. 38 for QAP to remove and replace the wyes associated with cells 10/11 and 11112, QAP will be seeking a Change Order for additional compensation under Paragraph 9.3.6 of the General Conditions for this work.

It is apparent based on QAP survey information these cells are significantly out of tolerance and as discussed will need to be removed and reset. In the absence of a definitive determination of a changed site condition or specific deficiencies in the specifications, QAP is responsible for providing work that meets the conditions of the specifications and all cost associated with providing said work.

Thank You,

John Williams
ICRC Senior Construction Manager

Cc: Nate Pennington- ICRC procurement
Brett Flint, P.E. – ICRC Manager of Construction

Item H13:

QAP Letter 101 Response to ICRC #46

QAP

GENERAL CONTRACTORS

240 W. 68th Avenue, Anchorage, Alaska 99518

Telephone (907) 522-2211 Fax (907) 344-5798

July 14, 2009

John K. Williams
Construction Manager III
ICRC - Anchorage Port Expansion Team
421 West Post Ave.
Anchorage, AK 99501

Re: Port of Anchorage Expansion Project
2008 Marine Terminal Redevelopment
Response to ICRC letter 46
Letter No. 101

Mr. Williams,

In response to the specific paragraphs of ICRC's letter 46, QAP offers the following:

Paragraph 1:

QAP disagrees that we have not provided adequate information to ICRC to identify the differing site conditions. For the record, we have had multiple geotechnical engineers look at the information provided in the bid documents. QAP has provided ICRC with data and reports from these geotechnical firms. There is adequate information to identify movement that shows a change in condition. The bid documents clearly contemplated that the existing soils comprising the structural fill and those located below it would be stable, and would not, absent a seismic event, migrate seaward. Similarly, the bid documents did not contemplate the seaward movement of the Wye piles both during and after placement. If such movement was expected by the design team and the Owner who warranted the design, then there was a serious failure to disclose this material information to the bidders. If the movement was unanticipated, as QAP currently believes, then there is a changed condition because there is soils movement both within and below the structural fill that is having the unintended consequence of pushing Wye piles out of tolerance and compressing the tail walls. Whether ICRC prefers to consider the failure to anticipate the existing and continuing soils movement as a differing site condition under Paragraph 9.9.2 of the General Conditions, or as a matter of specifications which will not produce a conforming product, is far less important than its refusal to acknowledge the problem. The bottom line is that the conditions in the field coupled with the existing specifications do not result in the construction of a conforming product. Nevertheless, QAP will continue to provide pertinent information to ICRC as it is collected through our independent soils investigation and inclinometer results.

Paragraphs 2and 3:

In the June 17, 2009 meeting Shannon and Wilson offered two possible explanations for the deflection of the inclinometers. One was that subsurface soils slip westward was a rotational failure, and the other was settlement/consolidation of the structural fill. Since that time, however, QAP has continuously monitored and surveyed the elevation of the tops of the inclinometers. If the measured deflection of the inclinometers was being caused by settlement/consolidation of the structural fill, then the soil surface and tops of the inclinometers would be sinking. The surveys have now established that is not occurring, and have eliminated settlement/consolidation as a possible cause of the deflection. Shannon and Wilson no longer believes that settlement/consolidation is a possible explanation for the deflection measured in their inclinometers. Shannon & Wilson does not oppose providing a sealed letter regarding the soils movement as demonstrated by its inclinometer results when its monitoring is complete. Meanwhile, ICRC will continue to be provided Shannon & Wilson's interim measurements.

ICRC's statement that existing material does not appear to have moved at all, illustrates that ICRC is misreading the inclinometer results. Those results clearly show soils movement below the structural fill layer, down in the native materials. Similarly, ICRC's raising of the shallow slope failure as a potential cause of the Wye pile movement, is also uninformed and unhelpful because it ignores the fact that the minimal shallow slope failure observed, occurred before MKB relocated the Z piles down slope and stabilized the slope closer to the dock face and pile driving. Movement of the Wye piles continued after the Z piles were relocated down slope and after there has been no visible slope failure cracks indicating a slope failure. The shallow slope failure was simply not causally related to the subsurface soils and Wye pile movement

ICRC claims to believe that the results of our inclinometer tests are not conclusive; however, ICRC has yet to offer any interpretation of the movement which was acknowledged in letter 46. Please provide QAP with ICRC's interpretation of the inclinometer data we have previously provided.

Paragraph 4:

ICRC's statement regarding the fill placement is inaccurate. For the record, QAP placed the entire fill in accordance with the contract specifications. QAP provided ICRC with all of the CQC reports and ICRC never notified QAP of any non conforming activities or materials relevant to the fill. If ICRC felt there was any problem or nonconformance with the fill placement, it should have addressed this issue during the fill activity.

The absence of shoreblock as a suggested cause of the subsurface soils movement and Wye pile migration is equally off base. As ICRC well knows, the shoreblock mats were never designed or intended to provide subsurface slope stability. The shoreblock mats were proposed as a means to retard surface erosion, and would had to have been removed prior to pile driving anyway, so they could not have provided any stability (surface or subsurface) during and/or after driving. Since the winter shore ice build up provided the surface slope stability we needed to preserve the fill, the shoreblock mats were unnecessary, and their absence during winter is irrelevant to soils movement conditions occurring in the spring and now into the middle of summer.

Paragrph 5:

ICRC's statement regarding its concern that QAP's engineers have not been involved in recommending corrective actions is simply inaccurate. QAP has had numerous meetings with our engineers regarding the fill placement and will continue to keep them involved. They have offered solutions that mirror PND's solutions. ICRC continues to ignore previous conversations and meetings with PND and ICRC where QAP asked "what was specifically needed in the fill plan because we do not want to redesign the whole job". PND's representative response was, "to ensure that the slope was stable enough to support the cranes and equipment." Nothing was ever mentioned about slip plans or a material movement. Also, on numerous occasions, PND stated , "this is the way we envisioned this being built." It is obvious QAP placed the fill in accordance with the project specifications which was satisfactory with the engineer of record

Paragraph 6:

The additional geotechnical testing that ICRC claims was performed after the critical reports referenced in our previous letter does not appear to us to have been conducted in the place we are now experiencing soils movement. Based on our, and our surveyor's, reading of the bid documents, it appears the nearest test bores were performed approximately 150 feet to the South/Southeast of our Southern most inclinometer, and the next was approximately 225 feet East/Southeast of our Northern most inclinometer. QAP acknowledges that there were also some cone tests, from which extrapolated assumptions of soils conditions were made. But those do not produce samples of actual insitu material. We make no comment on the independence of any engineering reviews which may have been made of data collected after the reports to which we made reference. Suffice it to say, that the distances of nearest actual test holes to the areas of proven instability do not provide levels of comfort, security, or certainty given the current empirical data.

Paragraph 7:

ICRC's claims regarding allegedly defective CQC for the sheet pile installation is not related to the proven soils movement. The soils have not moved as a consequence of the CQC plan, and in fact, it was as a consequence of the CQC plan that the movement of the piles at issue was discovered by QAP and brought to ICRC's attention. Additionally, Special Condition 25 states, "The Subcontractor shall prepare and submit a Construction Quality Control Plan (CQC Plan), which must be approved by ICRC before Work may begin." QAP did submit its CQC Plan dated May 18, 2008 to ICRC, and on May 28, 2008 ICRC approved it with ICRC's "No exceptions taken" comment. It was not until <u>after</u> QAP brought the current problems discovered as a consequence of that CQC Plan to ICRC's attention, that ICRC requested QAP to update its CQC Plan on May 22, 2009.

Since the belatedly alleged CQC Plan deficiencies are a separate issue, they will be addressed as such in a separate letter. Meanwhile, ICRC's offensive statements concerning QAP's lack of good business practice are both untrue and counterproductive. QAP has stated several times that we are trying to maintain a working relationship with ICRC, and that our primary objective is to complete our contractual agreement. The defensive nature of ICRC's responses, now coupled with offensive allegations about QAP's business practices, makes QAP's continuing efforts to work with ICRC in a problem solving mode more difficult.

QAP also disagrees with ICRC's statement concerning QAP's lack of survey information. For the record, QAP submitted multiple surveys to ICRC before ICRC's surveyor was on site to obtain a field survey. Further, QAP has implemented its own aggressive survey and monitoring program. QAP's surveyor along with TWA, our subcontractor, monitors the wyes almost everyday. QAP survey and monitoring plan is providing accurate information in which we continue to provide to ICRC.

Paragraph 8:

QAP believes that suspending work until a solution is found, or until ICRC agrees to accept the Wyes as constructed, is in ICRC's and the Owner's best interest because of their increasing exposure to QAP's claims and damages, and the pass through claims of MKB. Continuing work without addressing the root of the problem will simply provide more of the same results that put us all in the position we now find ourselves in.

Finally, QAP submits as an attachment MKB's own June 30, 2009 response to ICRC letter no. 46.

We welcome any constructive help offered in addressing this problem from ICRC. Please feel free to contact us at our Post Rd. office at 865-5971 or by email at tdudley@colaska.com.

Thank you,

Tim Dudley

Tim Dudley
Project Superintendent

MKB CONSTRUCTORS

t: 425.285.0593 f: 425.285.0641

12735 Willows Road NE, Kirkland, WA 98034

mkbconstructors.com

Tim Dudley
Quality Asphalt Paving
240 W. 68th Avenue
Anchorage, AK 99518

June 30, 2009

Re: Port of Anchorage Expansion Project
2008 Marine Terminal Redevelopment

Subject: Response to ICRC Letter #46

Gentlemen;

Following is our response to ICRC letter #46. Since the letter covers a number of subjects we will respond by paragraph (#) as appropriate.

1) MKB has provided notice of differing site conditions based on the wye pile movement in excess of the construction tolerance.

5) As reported to ICRC, MKB did discuss the issue of the wye pile movement with its cell template engineer, Vello Koiv, of VAK Construction Engineering Services, LLC. Mr. Koiv suggested that a geotechnical engineer would be the appropriate engineering discipline to review the problem. We are aware that QAP has enlisted the services of Shannon and Wilson in this endeavor. It should also be noted that we have enlisted the services of Northern Geotechnical Engineering Inc. to review the site conditions and information being developed on the site. Any information generated from this service will be forwarded for review.

7) ICRC has been aware of the problem concerning the wye pile movement for over two months. While the amount of movement appears to have been mitigated through various changes made by ICRC in the installation process, there continues to be movement in the wye location greater than the allowable construction tolerance. Construction tolerances allowances must be approved by ICRC.

MKB also respectfully disagrees with ICRC concerning the sequence of work. All work has followed a general installation plan set forth at the onset of the project and approved by ICRC and their consulting engineers. That plan changed after the situation with the wye pile movement was discovered. The only part of the sequence that is variable is the final drive to depth with the impact hammer. Impact hammer work is subject to in-water impact driving restrictions as well as night time in water night time driving restrictions. Work has to be scheduled

around tidal activity that changes on a daily basis and night time driving restrictions that are currently more stringent than ICRC had indicated in the contract documents.

8) ICRC has to become more engaged in the solution to the pile movement and pile condition problems encountered on the site. Please be reminded, the OCSP structures are a patented and proprietary design held by PN&D. MKB and their engineer have made numerous attempts to address the change of condition issues although without access to the proprietary design data we must rely on ICRC's consultant for direction. MKB has made numerous changes to its work plan to include accelerating the project schedule all in an effort to provide the project within the time constraints of the project. We have made several requests for directions from ICRC and its consultants as we move forward with the project. These requests have gone largely unanswered. We are literally spending thousands of dollars a day building a project based on assurances from ICRC that engineering revisions to the construction tolerance will be made. But as of this writing we do not have any direction from ICRC other than the veiled threat that there will be significant impacts to the overall Port of Anchorage Expansion project that the Contractor (and its subcontractor) may be liable for if we do not continue.

Sincerely,
MKB Constructors

Andrew Romine
Alaska Regional Manager

Item H14:

QAP Letter re: RFI 97 and 110

QAP

GENERAL CONTRACTORS

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Telephone (907) 522-2211 Fax (907) 344-5798

August 5, 2009

Mr. John Williams
Construction Manager III
Integrated Concepts & Research Corporation
421 West Post Ave.
Anchorage, AK 99501

Re: RFI 97 and 110
Port of Anchorage North Expansion
Project No. 3404-1-C170
Letter No. 110

Dear Mr. Williams,

This letter is offered in response to RFI 97 and 110 concerning Vibracompaction refusal. The response given is not what the plan states. On sheet 26 of 34 of the Barge Berth Plans it states:

Obstructions:
In the event that subsurface obstructions are encountered which cannot be penetrated with reasonable effort, as determined by ICRC, a replacement probe shall be installed as directed by ICRC.

By indicating that there will be "no criteria set for refusal above mud line" ICRC is changing the contract. QAP and its Subcontractor have tried to penetrate with a reasonable effort.

On Sheet 27 of 34 of the Barge Berth Plans note 3 states:

3. Advance probe at resonant frequency I (approximately 15 Hz) to 5 feet below mudline (into dense sands or stiff clays) or Refusal. Refusal shall be considered when probe slows to 30 seconds per foot for the last foot.

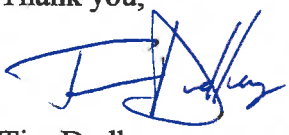
Note 3 never states the last foot had to be below the mud line. A review of the probe logs shows refusal at approximately 1' of penetration per minute, which is a consistent measure. The plans require that another probe location be identified if an obstruction (refusal) is encountered.

If ICRC would like us to pre-drill Vibracompaction holes please issue an RFP for this extra work.

Per section 2.1.1 of the contract please consider this our notification of a potential impact and a change condition.

If there are any questions, please contact our office at 865-5971 or by email at tdudley@colaska.com.

Thank you,



Tim Dudley
QAP Project Superintendent

Item H15:

QAP Letter 120, Notice of Intent to Claim

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Port of Anchorage Expansion Project No. 3404-1-C170
2008 Marine Terminal Redevelopment
Claim of QAP and Pass Through Claim of MKB Pursuant to Notice of Intent to Assert
Claim Dated June 26, 2009

GENERAL CONTRACTORS
240 W. 68th Avenue, Anchorage, Alaska 99518
Telephone (907) 522-2211 · Fax (907) 344-5798

August 25, 2009

Brent Flint, P.E.
Senior Project Manager
John Williams
Senior Construction Manager
ICRC Purchasing Office
ICRC Subcontracts Representative
ICRC 421 West 1st Avenue, Suite 200
Anchorage, AK 99501

Re: Port of Anchorage Expansion Project
2008 Marine Terminal Redevelopment
Claim of QAP and Pass Through Claim of MKB Pursuant to Notice of Intent to Assert Claim Dated June 26, 2009
QAP Letter No. 120

Gentlemen:

Submitted simultaneously with this letter is Colaska, Inc d/b/a QAP's (QAP) Claim. It consists primarily of the sponsored pass through claim of QAP's Subcontractor, MKB, relating to differing site conditions and those matters referenced specifically in QAP's Notice of Intent to Assert Claim Dated June 26, 2009, and the many serial letters on those subjects which have been exchanged by the parties in the interim.

The Claim format presents QAP's, and its Subcontractor's joint introduction and overview of the claim, followed by their analysis of entitlement relative to the unanticipated soils movement and piling installation impacts. Although the Claim consistently refers to "Subcontractor", that term is expressly meant to reference both QAP as subcontractor to ICRC, and QAP's own subcontractor, MKB. The entitlement portion of the claim details the conditions giving rise to the claim and the justifications for relief under the Contract. It not only summarizes and analyzes the field observations and geotechnical data which have previously been shared with ICRC through the serial letters on the subject exchanged since May 2009, but also supplements that data with more recent measurements and observations, and the opinion of our geotechnical engineering consultant, Shannon & Wilson, Inc. A copy of Shannon & Wilson's Preliminary Report is attached to the Claim.

It should be noted that it is QAP's and its Subcontractor's intent that the serial letters exchanged on the subject of this Claim since May are hereby incorporated by reference into and form a part of the Claim, although these serial letters are not separately resubmitted as attachments thereto.

The items of subcontract work affected and how they were affected are also addressed both in the entitlement section of the Claim, and in those separately presented impact or quantum portions of the Claim. Based upon its own review, analysis and computations, MKB has presented the impacts to itself to date in time and money with respect to specific items of subcontract work affected, and the relief it is seeking by way of its pass through claim. Again, this includes both additional subcontract time based upon delays caused by the conditions discussed, the costs associated with those delays, plus its additional itemized costs of addressing the differing site conditions.

Following MKB's presentation of its impacts and costs, is QAP's separate analysis and computation of its own damages suffered to date as a consequence of the conditions discussed in the entitlement portion of the Claim.

QAP is unable to say now that the events and conditions giving rise to this Claim are not attributable to the Government. As pointed out in its Letter No. 95/Notice of Intent to Assert Claim, its notice was provided under both G.C. 9.9.2 (differing site conditions) and under G.C. 15.2.1 (defective specifications). QAP stated that (in accordance with G.C. 15.2.3), it was giving notice that, to the extent it was delayed, required extensions of contract time and additional compensation due to differing site conditions and/or defective design or defective specification, the Government and ICRC may be jointly responsible. While the Owner is generally responsible for differing site conditions, and warrants the adequacy of the plans and specifications, QAP is not aware of the terms and conditions of the contract(s) between ICRC and the Owner, or the extent to which ICRC may have assumed, or agreed to indemnify the Owner, from claims based on these issues. Moreover, QAP has no information as to the extent the Owner has been kept apprised of the ongoing issues presented in the Claim, the refusal of QAP's previous request to suspend work, and so on. Without such information, QAP is unable at the present time to delineate the extent to which the Owner and/or ICRC may be liable for the impacts stated in the Claim.

As ICRC is well aware, both MKB and QAP claim that the impacts they have suffered, and are currently suffering, will continue unless and until an appropriate Change Order is issued, as has been discussed in previous serial correspondence presented by QAP to ICRC. Most recently, QAP by serial Letter No. 112 on August 7, 2009 requested that the August 25, 2009 deadline for filing this Claim be extended or suspended, both because of ongoing negotiations to resolve the matters set forth in the attached Claim, but also because the impacts are continuing, and geotechnical data supporting this Claim are continuing to be collected and presented to ICRC. By ICRC's Letter No. 53 dated August 11, 2009, QAP's request for an extension or suspension of

the claim filing deadline was rejected. QAP reiterates here that which was stated in its serial Letter No. 112: that both QAP and MKB expressly reserve the right to supplement the materials submitted with this Claim, both with respect to entitlement and quantum.

In the interim, QAP will do as it has always done, by continuing to share relevant data and information with ICRC as it is developed which may assist it in resolution of this Claim. QAP continues to hope for an informal resolution outside of this claims process.

Should you have any particular questions regarding the Claim, or like to discuss any of this, please do not hesitate to give me a call.

I certify that this Claim submitted herewith is made in good faith, that the supporting data with respect to both entitlement and to QAP's impact damages are accurate and complete to the date of this Claim to the best of my knowledge and belief; and that the amount requested by QAP for itself accurately reflects the contract adjustment to date for which the QAP believes the Government and/or ICRC is liable; and that I am duly authorized to certify the claim on behalf of QAP.

Sincerely,

Colaska, Inc. d/b/a QAP

By: Jon Fuglestad
Its: Vice President and General Manager

Port of Anchorage Expansion Project – 2008 Marine Terminal Redevelopment
QAP Claim for Added Costs and Time Extension Due to Differing Site Conditions
Submitted to ICRC on August 25, 2009

I. Introduction: This claim is being submitted by QAP on behalf of itself and its subcontractor, MKB, in accordance with the directive contained in ICRC letter #53, which required QAP to submit this claim by August 25, 2009, in spite of the request QAP has made to extend the deadline for submittal. QAP had requested to extend the deadline for submittal because the impacts driving its (and MKB's) added costs are ongoing and the full extent of the cost and schedule impacts cannot be fully understood until the affected work is completed. With that in mind, QAP is presenting the added costs both it and MKB have incurred to date, as well as the schedule impacts that are continuing, with the understanding that these impacts will be updated as the work progresses towards completion and the full extent of the cost and schedule impacts are more completely known.

Entitlement to the cost and schedule impacts described in this claim is based on two differing site conditions that QAP and MKB (collectively hereinafter "Subcontractor") have encountered which could not have been known at the time bids were submitted for the project in early 2008. The first differing site condition relates to unanticipated soil movements in the native material underlying the project site. This condition has forced changes to the construction plan and has caused installed piling to move unexpectedly from their installed locations, potentially requiring their removal and reinstallation. The second differing site condition relates to unanticipated soil conditions and piling installation specifications that have caused pile installation work to be delayed, adding both cost and time to the overall project.

To a great extent, the entitlement arguments for both of these differing site conditions have been described in detail in serial numbered letters submitted by Subcontractor beginning in May 2009 and continuing until the date of this claim submittal. These serial letters are incorporated by reference. Similarly, ICRC has documented its positions in response to Subcontractor's letters with its own series of serial numbered letters, identifying many alternative theories to counter Subcontractor's contention that differing site conditions exist. To date, there has been little agreement between the parties.

It is not the intent of this claim to restate all of the positions that have been expressed by both parties over the past four months. The written record speaks for itself and so far has not resulted in a position that both parties are willing to accept. Instead, this claim will summarize Subcontractor's position with regard to entitlement, including expert opinions that have recently been presented by Subcontractor's geotechnical consultant, Shannon & Wilson, which have not been considered previously by ICRC and which provide compelling support for Subcontractor's position.

In addition, this claim will establish the elements that make up both the cost and schedule aspects of Subcontractor's claim; document the costs to date; and predict the

ultimate value of the cost and schedule impacts assuming the work advances forward as it is currently anticipated to do. This will provide ICRC with at least a benchmark to understand the overall impacts affecting Subcontractor. MKB has separately analyzed and completed its own impacts and damages, which are separately set forth following the Entitlement Sections of the Claim. QAP's separate impacts are set forth separately following MKB's.

Finally, it is interesting to note that ICRC has rejected Subcontractor entitlement arguments by offering hypothetical opinions and theories suggesting that the root cause of the problems Subcontractor has encountered are not the result of differing site conditions, as Subcontractor claims, but instead are the result of a multitude of ills on the part of Subcontractor. After proffering these opinions and theories, ICRC then categorically rejects Subcontractor's entitlement arguments because they have not disproved ICRC's theories. Subcontractor acknowledges that the burden of proof rests with itself, but it does not feel obligated to disprove all of ICRC's alternative causes before it is entitled to claim damages. These claims, and the previous serial numbered letters, demonstrate a level of proof that most in the industry would consider adequate to support the damages being claimed. We trust that ICRC, after considering Subcontractor's positions in their entirely, will come to the same conclusion.

II. Entitlement – Unanticipated Soil Movement: Subcontractor contends that the foundation soils underlying the project site are moving in ways that were unexpected by ICRC and its engineers, resulting in forces being applied to both the granular fill material placed on top of these foundation soils as well as forces being applied to cell wall face piling that causes binding in the pile interocks and results in the face piles being pushed seaward beyond acceptable tolerances.

The first indication of this condition was observed in May 2009 when it was discovered that recently installed face piles did not remain in the location in which they were initially installed. Numerous theories were advanced by ICRC in an attempt to explain the causes for the unanticipated pile movement, which are documented in ICRC serial numbered letters beginning in late May. However, none of the ICRC theories allowed that movement of the foundation soils was a contributing cause. Instead, ICRC argued that contractor means and methods were the primary cause.

ICRC engineers and Subcontractor's engineers provided a number of recommendations for altering means and methods that were intended to reduce or eliminate the movement of the face piles beyond acceptable tolerances. In spite of Subcontractor's implementation of these altered means and methods, the face piles continued to move beyond acceptable tolerances.

During this time, ICRC continuously focused on the means and methods used by Subcontractor to place granular fill material as a culprit for the soil movement dilemma, instead of admitting that movement of the underlying foundation soils was at the root cause. ICRC maintained this position, in spite of geotechnical data that indicated that the entire granular soil column was moving on top of the foundation soils. Evidence of

this was most clearly apparent as a result of the compression distortions that appeared in the tail walls, even when the tail walls were extended to their entire design length. Further evidence that forces other than the granular fill placement practices were causing the face pile movements was provided when Subcontractor installed the "Z-Piles" midway down the dike slopes, and yet the face piles still were forced out of tolerance.

In spite of Subcontractor's efforts to alter its means and methods for granular fill placement in order to eliminate this as a root cause for the soil movement problem, ICRC has continued to advance further theories related to the granular fill. At the same time, ICRC has failed to acknowledge that unanticipated movement of the foundation soils is at least contributing to the problem, if not at the root cause of the problem. ICRC itself admits that foundation soil movement was not anticipated by its design when it made the following statement in its June 21, 2009, Letter # 46:

> *"A considerable amount of geotechnical engineering effort and analysis has been performed to show that the foundation soils are stable and movement, as alleged by QAP, is highly unlikely."*

Subcontractor agrees this was an underlying expectation at the outset of the project and both QAP and MKB based their bids and work plans on this understanding. Subcontractor also contends that to the extent it can demonstrate that the foundation soils are not stable and that movement is occurring, this is a legitimate basis for a differing site condition.

When Subcontractor first became aware of the possibility of unanticipated soil movement in early June 2009 it engaged the services of Shannon & Wilson to help understand what was causing the soil movements. Shannon & Wilson installed a number of inclinometers at the project site and monitored them over the course of the next three months, providing periodic reports to Subcontractor which were promptly provided to ICRC. These reports indicated soil movement in both the granular fill and in the foundations soils. As of August 20, 2009, Shannon & Wilson had only provided the raw data which Subcontractor provided to ICRC, but did not provide their expert opinion explaining the raw data.

However, on August 21, 2009, Shannon & Wilson provided a preliminary copy of their expert opinion explaining the raw data. A copy of their report is included as Exhibit A to this claim. Section 5.0 of their report provides a discussion of the results. There are a number of points from their discussion worth summarizing here. They include the following:

- There is soil movement in both the granular fill material and the underlying silt and sand (the foundation soil).

- The movement of the granular soil is consistent with the beginning of a rotational failure of the granular fill, with the plane of weakness primarily comprised of silt and sand underlying the fill.

- The weight of the fill is likely the major component of the movement that has been observed and measured. Some of this movement has occurred in the sands and silts below the fill and some of the movement has been primarily within the fill section.

- There is a potential tipping type of movement at the face of the open cells, even when limited construction is taking place. It appears that the whole wall system is continuing to move, or worse, tip, which will increase movement as the fill material is placed in the cells.

Based on the above, it is clear that Shannon & Wilson attribute the underlying root cause to movement of the foundation soil, which as ICRC agrees was not anticipated by the design documents.

Shannon & Wilson's preliminary report provides the most definitive analysis of the soil movement issue that has been available to either party to date. In spite of ICRC's focus on the granular fill placement means and methods as a root cause for the soil movement problem, Shannon & Wilson clearly places the root cause on the underlying foundation soils. To the extent that ICRC accepts Shannon & Wilson's conclusions, this should end the debate regarding whether or not a differing site condition exists. Consequently, Subcontractor is entitled to the damages caused by this differing site condition, which are described in later sections of this claim.

III. Entitlement – Piling Installation Impacts: Subcontractor contends that the specifications governing the installation of piling, particularly in the clayey Bootlegger Cove Formation known to exist in the project area, create a near impossibility to comply with the specifications because of the requirement to use a vibratory pile hammer. The vibratory hammer adversely affects the clay layer, which significantly increases the forces needed to install the piling and potentially precludes the overall pile installation process. As a result, Subcontractor has had to add additional personnel, equipment and materials above and beyond what could reasonably have been anticipated based on the information contained in the bidding documents. Even with the addition of these personnel and equipment, Subcontractor is unable to provide the completed facility in accordance with its original plans and the contract requirements.

The majority of the problems Subcontractor has had with piling installation occurred during the 2009 construction season while working on the North Extension portion of the project. During the 2008 construction season, while working on the Barge Berths, Subcontractor was able to install piling in accordance with the specifications and

encountered difficulty only on a portion of the piling. However, the piling in this area of the project are shorter and the amount of time the vibratory hammer was needed to drive the piling was considerably less than those piling needed for the North Extension. The longer piling on the North Extension portion of the project required the vibratory hammer to operate for longer periods of time, exacerbating its affect on the underlying clayey soils.

Subcontractor has worked closely with its engineers to identify causes for the pile installation difficulties and identify solutions. It is Subcontractor's belief that when the tip of the sheet pile hits the hard Bootleggers Cove clay the pile energy resonates through the soil mass causing the soft mud interface (between granular fill and hard clay) to weaken. When pile tips encounter the hard clay more time is spent with the vibratory hammer to get the piles to move through the hard clay. Although the piles still continue to advance, the speed at which they advance is greatly reduced and at the same time the energy and vibration levels in the soil mass is greatly increased further exacerbating the problem.

ICRC contends that the use of a vibratory pile hammer does not change the density of the soil and does not affect the ability to drive the piling to the design tip elevations. However, Subcontractor's geotechnical engineer disagrees with ICRC in this regard. Subcontractor's engineer contends the vibratory hammer causes strength loss in the clay and in granular soils during the pile driving process. This condition, coupled with the requirement to limit the depth that adjacent sheet pile can be driven, forces the pile driving process to halt temporarily, which permits the soils to set up and makes it difficult to drive to the design depth when returning to complete the installation.

ICRC's suggestion that the difficult driving may be caused by consolidation in the granular fill in the trenches and dike is not consistent with the driving experience. No hard driving has been experienced in these materials. Rather, the hard driving has consistently been experienced within the last 10 feet of tip elevation, which is in the Bootlegger Cove clay. The driving is a little easier at slack high tide, but is not appreciably different between slack low tide on the one hand, and when the tide is incoming or outgoing. Therefore differential tidal pressures do not appear to be a cause of the hard driving. Moreover, since Subcontractor installed Z sheet piles down slope between the crane pads and the pile faces, most of the slope pressure on the pile faces has been reduced to the extent that it has little or no contribution to the hard driving.

It is Subcontractor's contention that the reaction of the Bootlegger Cove clay to the extended time necessary to penetrate the clay with the vibratory hammer is a differing site condition that was not anticipated by the specifications and the contract documents, nor could Subcontractor have anticipated the difficulties involved when it submitted its bid. Subcontractor believes that soil movement is the major contributing factor causing difficulties with the pile driving. The Bootlegger Cove clay layer is also a contributing factor but in Subcontractor's opinion the soil movement affects binding in the sheet pile and wye pile interlocks and ultimately forces the face piles beyond acceptable tolerances. Subcontractor intends to continue to pursue a claim for the damages

resulting from what it believes to be a legitimate differing site condition. Those damages are described in later sections of this claim.

IV. QAP's Quantum:

Calculation of QAP's Damages: QAP has incurred or will incur damages as a result of the differing site conditions described above and in the categories shown below. A portion of these costs are for additional labor and equipment needed to support the pile driving operations of our subcontractor, MKB Constructors. MKB Constructors direct damages have been presented separately above. QAP has incurred other costs for Geotechnical Engineering consultation, which was required to investigate and demonstrate the differing site conditions. In addition, QAP has or will incur time related costs for extended general conditions as well as home office overhead due to the delay in completing the work. Finally, QAP has incurred both legal and claim preparation costs as described below. Each of these cost elements are described in further detail below.

Support to MKB: At the suggestion of ICRC, Subcontractor altered the sequence in which the face piling and tail walls were installed. This was done in an effort to mitigate the movement of the face piling after it was installed. Altering this sequence required Subcontractor to trench the areas where the tail walls were to be installed and to maintain the trenches while the work was taking place. Had Subcontractor been able to follow its original installation sequence the trenching would have been unnecessary because QAP had intended to push the granular material covering the tail walls forward to fill in behind the face piles, which would have allowed the tail walls to be installed on a level surface. The added cost incurred by QAP for this effort has been captured in QAP's job cost system under a specific cost code. The cost to date is $44, 616 and is expected to increase as the work proceeds. A copy of QAP's job cost report documenting these costs is included as Exhibit B to this claim.

Geotechnical Consultation: As described above, QAP has employed Shannon & Wilson to perform numerous geotechnical studies to help understand and document the reasons for the unanticipated soil movement described above. Shannon & Wilson has installed a number of inclinometers on the jobsite and has continued to take readings from these inclinometers over the past 4 months. In addition, Shannon & Wilson has also authored a report describing their professional opinions regarding the soil movement on the project. The cost to date is $98,299 and is expected to increase as the work proceeds. A copy of Shannon & Wilson's invoices to date has been included as Exhibit C to this claim.

Extended General Conditions: Both of the differing site conditions described herein have resulted in delays in the completion of the work and have forced QAP to extend the completion date for the entire project. Altering the sequence for installation of the tail walls forced this activity to be on the critical path to completion, which alone extended the completion date by 6 weeks. In addition, other delays forced further

extensions of the overall completion date. All of these delays are described in detail in QAP's Letter No. 113, which is attached to this claim as Exhibit D.

In addition, a simplified version of QAP's latest completion schedule has been attached to this claim as Exhibit E. This schedule shows the original completion date that was planned before encountering the delays associated with the differing site conditions. Furthermore, the schedule shows the new predicted completion date that results after incorporating the known delays and the loss of productivity attributable to the differing site conditions. As the new completion schedule indicates, the predicted completion date for the project is now July 15, 2010.

The new completion date of July 15, 2010 requires that QAP incur a winter shutdown and that QAP return to complete the work beginning in late April of 2010. Compared to QAP's original schedule, this results in nearly 6 additional months of winter shutdown time and 2 additional months of active work on the project for its jobsite staff. QAP's monthly general conditions costs are detailed in Exhibit F of this claim. They result in the following totals:

Added Winter Shutdown General Conditions:
$29,527 x 6 months = $177,162

Active Construction General Conditions:
$135,729 x 2 months = $271,458

Total $448,620

Extended Home Office Overhead: Based the extended duration shown in the schedule in Exhibit E, QAP's home office will be required to support this project for an extended period of time. Since there will be no revenue accruing to QAP during the winter shutdown, QAP will not seek extended home office overhead costs during that time frame. However, QAP's home office will be required to support the project for two additional months in 2010 when the work is presently scheduled to be completed. Consequently, QAP will seek the costs shown in Exhibit G for extended home office support. These costs were calculated based on the industry accepted Eichleay formula. The total for these costs is $315,025.

Winter Shutdown: Since QAP will be forced to shutdown the project for the winter season and remobilize to return to the work in the spring of 2010, it will incur the same costs it incurred when it shutdown for the winter of 2008/2009. QAP's costs are estimated to be $50,000.

Claim Preparation and Legal Costs: At this point in time QAP estimates these costs to be $24,000, recognizing that they may increase over time depending on the final outcome of the project.

Cost Summary: At this point in time, QAP estimates its total claim costs to be as shown below. These costs assume the work will be completed in accordance with the revised schedule that is attached as Exhibit E and that protracted negotiations and/or further legal venues will not be necessary. To the extent that these conditions are not achieved QAP reserves the right to adjust its claim to reflect the actual conditions at the completion of the work.

Support to MKB		$44,616
Geotechnical Consultation		$98,299
Extended General Conditions		$448,620
Winter Shutdown		$50,000
	Subtotal	$641,535
QAP Markup @ 10%		$64,153
QAP Markup on MKB Costs @ 10%		$526,384
	Subtotal	$590,537
Extended Home Office Overhead		$315,025
Claim Preparation and Legal		$24,000
Bond Costs @ 0.5%		$7855
	Subtotal	$346,880
	Grand Total	**$1,578,952**

IV. MKB Quantum

MKB's Quantum is included in a separate three ring binder.

EXHIBIT A

See front binder cover for Shannon & Wilson Geotechnical Report

EXHIBIT B

Job /Sub- Q28292 2008 MARINE TERMINAL REDEVELOPMENT

DATE	G/L-SUB	JRNO	JRSQ	SOURCE	DESCRIPTION	REFERENCE	P/O #	UNITS/QTY	UM	UNIT COST	AMOUNT
9189.	E ASSIST MKB										
06/27/09	95550.01.00080.000	EQ00577	0038	EQ06272009	EQUIPMENT						1,964.50
07/04/09	95550.01.00080.000	EQ00578	0035	EQ07042009	EQUIPMENT						5,909.50
07/11/09	95550.01.00080.000	EQ00579	0034	EQ07112009	EQUIPMENT						7,499.50
07/18/09	95550.01.00080.000	EQ00580	0036	EQ07182009	EQUIPMENT						4,608.50
07/25/09	95550.01.00080.000	EQ00583	0037	EQ07252009	EQUIPMENT						5,119.50
08/01/09	95550.01.00080.000	EQ00586	0036	EQ08012009	EQUIPMENT						2,094.00
08/08/09	95550.01.00080.000	EQ00587	0039	EQ08082009	EQUIPMENT						2,104.00
SHOP EQUIP	COST						PTD	.00	UN		29,299.50
							PTD	.00	QTY		
9189.	L ASSIST MKB										
06/27/09	51202.01.00080.000	PR00844	0520	PR06272009	BURDEN						92.04
06/27/09	51213.01.00080.000	PR00844	0521	PR06272009	BURDEN						210.46
06/27/09	51232.01.00080.000	PR00844	0522	PR06272009	BURDEN						61.10
06/27/09	51100.01.00080.000	PR00844	0532	PR06272009	LABOR EXPE						768.74
07/04/09	51202.01.00080.000	PR00848	0431	PR07042009	BURDEN						261.62
07/04/09	51213.01.00080.000	PR00848	0432	PR07042009	BURDEN						609.16
07/04/09	51232.01.00080.000	PR00848	0433	PR07042009	BURDEN						147.87
07/04/09	51100.01.00080.000	PR00848	0441	PR07042009	LABOR EXPE						1,696.08
07/11/09	51202.01.00080.000	PR00849	0525	PR07112009	BURDEN						248.65
07/11/09	51213.01.00080.000	PR00849	0526	PR07112009	BURDEN						575.26
07/11/09	51232.01.00080.000	PR00849	0527	PR07112009	BURDEN						152.25
07/11/09	51100.01.00080.000	PR00849	0533	PR07112009	LABOR EXPE						1,817.51
07/18/09	51202.01.00080.000	PR00850	0450	PR07182009	BURDEN						149.98
07/18/09	51213.01.00080.000	PR00850	0451	PR07182009	BURDEN						343.74
07/18/09	51232.01.00080.000	PR00850	0452	PR07182009	BURDEN						80.60
07/18/09	51100.01.00080.000	PR00850	0459	PR07182009	LABOR EXPE						1,021.37
07/25/09	51202.01.00080.000	PR00854	0467	PR07252009	BURDEN						178.69
07/25/09	51213.01.00080.000	PR00854	0468	PR07252009	BURDEN						413.91
07/25/09	51232.01.00080.000	PR00854	0469	PR07252009	BURDEN						122.56
07/25/09	51100.01.00080.000	PR00854	0476	PR07252009	LABOR EXPE						1,437.73
08/01/09	51202.01.00080.000	PR00855	0462	PR08012009	BURDEN						184.71
08/01/09	51213.01.00080.000	PR00855	0463	PR08012009	BURDEN						441.96
08/01/09	51232.01.00080.000	PR00855	0464	PR08012009	BURDEN						104.68
08/01/09	51100.01.00080.000	PR00855	0470	PR08012009	LABOR EXPE						1,368.12
08/08/09	51202.01.00080.000	PR00856	0456	PR08082009	BURDEN						242.48
08/08/09	51213.01.00080.000	PR00856	0457	PR08082009	BURDEN						597.11
08/08/09	51232.01.00080.000	PR00856	0458	PR08082009	BURDEN						141.44
08/08/09	51100.01.00080.000	PR00856	0465	PR08082009	LABOR EXPE						1,847.33
LABOR	COST						PTD	.00	UN		15,317.15
							PTD	.00	QTY		
COST CODE	COST TOTALS	PTD	.00	QTY				.00	UN		44,616.65
	Sub Job COST	PTD	.00	QTY				.00	UN		44,616.65

Job /Sub- Q28292 2008 MARINE TERMINAL REDEVELOPMENT

DATE	G/L-SUB	JRNO	JRSQ	SOURCE	DESCRIPTION	REFERENCE	P/O #	UNITS/QTY	UM	UNIT COST	AMOUNT
	SHOP EQUIP										29,299.50
	LABOR										15,317.15
	Job COST	PTD		.00	QTY			.00	UN		44,616.65
	SHOP EQUIP										29,299.50
	LABOR										15,317.15
	Division COST	PTD		.00	QTY			.00	UN		44,616.65
	SHOP EQUIP										29,299.50
	LABOR										15,317.15
	Company COST	PTD		.00	QTY			00	UN		44,616.65
	SHOP EQUIP										29,299.50
	LABOR										15,317.15

EXHIBIT C

Job /Sub- Q28292 2008 MARINE TERMINAL REDEVELOPMENT

DATE	G/L-SUB	JRNO	JRSQ	SOURCE	DESCRIPTION	REFERENCE	P/O #	UNITS/QTY	UM	UNIT COST	AMOUNT
9187.	L ADD'L ENG & TESTING										
08/08/09	51213.01.00080.000	PR00856	0454	PR08082009	BURDEN						154.22
08/08/09	51232.01.00080.000	PR00856	0455	PR08082009	BURDEN						34.07
08/08/09	51100.01.00080.000	PR00856	0464	PR08082009	LABOR EXPE						445.37
LABOR	COST						PTD	.00	UN		29,798.47
							PTD	.00	QTY		
9187.	O ADD'L ENG & TESTING										
06/26/09	53860.01.00080.000	PJ10274	0049	SURVEYORS	GLASS REPA	1930000	143330				70.00
07/15/09	53860.01.00080.000	PJ10358	0018	SHANNON	PROFESSION	15263					24,320.50
08/12/09	53860.01.00080.000	PJ10547	0151	SHANNON	PROFESSION	15313					11,726.86
08/12/09	53860.01.00080.000	PJ10547	0153	SHANNON	PROFESSION	15314					7,128.00
OTHER	COST						PTD	.00	UN		43,245.36
							PTD	.00	QTY		
9187.	S ADD'L ENG & TESTING										
07/29/09	50400.01.00080.000	PJ10457	0017	DENALIDRIL	PORT OF AN	Q28292 10		2.00	IN	12250.0000	24,500.00
SUBCONTRACTORS	COST						PTD	.00	UN		24,500.00
							PTD	2.00	QTY		
COST CODE	COST TOTALS	PTD	2.00	QTY				.00	UN		98,299.83
	Sub Job COST	PTD	2.00	QTY				.00	UN		98,299.83
	SHOP EQUIP										756.00
	LABOR										29,798.47
	OTHER										43,245.36
	SUBCONTRACTORS										24,500.00
	Job COST	PTD	2.00	QTY				.00	UN		98,299.83
	SHOP EQUIP										756.00
	LABOR										29,798.47
	OTHER										43,245.36
	SUBCONTRACTORS										24,500.00
	Division COST	PTD	2.00	QTY				.00	UN		98,299.83
	SHOP EQUIP										756.00
	LABOR										29,798.47
	OTHER										43,245.36
	SUBCONTRACTORS										24,500.00
	Company COST	PTD	2.00	QTY				.00	UN		98,299.83
	SHOP EQUIP										756.00
	LABOR										29,798.47
	OTHER										43,245.36
	SUBCONTRACTORS										24,500.00

Job /Sub- Q28292 2008 MARINE TERMINAL REDEVELOPMENT

DATE	G/L-SUB	JRNO	JRSQ	SOURCE	DESCRIPTION	REFERENCE	P/O #	UNITS/QTY	UM	UNIT COST	AMOUNT
9187.	E	ADD'L ENG & TESTING									
07/18/09	95550.01.00080.000	EQ00580	0035	EQ07182009	EQUIPMENT						756.00
	SHOP EQUIP	COST					PTD	.00	UN		756.00
							PTD	.00	QTY		
9187.	L	ADD'L ENG & TESTING									
05/30/09	51202.01.00080.000	PR00839	0400	PR05302009	BURDEN						116.14
05/30/09	51213.01.00080.000	PR00839	0401	PR05302009	BURDEN						308.66
05/30/09	51232.01.00080.000	PR00839	0402	PR05302009	BURDEN						91.94
05/30/09	51100.01.00080.000	PR00839	0410	PR05302009	LABOR EXPE						956.71
06/06/09	51202.01.00080.000	PR00841	0449	PR06062009	BURDEN						400.22
06/06/09	51213.01.00080.000	PR00841	0450	PR06062009	BURDEN						1,038.22
06/06/09	51232.01.00080.000	PR00841	0451	PR06062009	BURDEN						288.86
06/06/09	51100.01.00080.000	PR00841	0458	PR06062009	LABOR EXPE						3,125.24
06/13/09	51202.01.00080.000	PR00842	0437	PR06132009	BURDEN						168.90
06/13/09	51213.01.00080.000	PR00842	0438	PR06132009	BURDEN						448.96
06/13/09	51232.01.00080.000	PR00842	0439	PR06132009	BURDEN						126.81
06/13/09	51100.01.00080.000	PR00842	0448	PR06132009	LABOR EXPE						1,319.61
06/20/09	51202.01.00080.000	PR00843	0433	PR06202009	BURDEN						259.71
06/20/09	51213.01.00080.000	PR00843	0434	PR06202009	BURDEN						659.41
06/20/09	51232.01.00080.000	PR00843	0435	PR06202009	BURDEN						191.79
06/20/09	51100.01.00080.000	PR00843	0442	PR06202009	LABOR EXPE						1,995.91
06/27/09	51202.01.00080.000	PR00844	0517	PR06272009	BURDEN						226.57
06/27/09	51213.01.00080.000	PR00844	0518	PR06272009	BURDEN						575.23
06/27/09	51232.01.00080.000	PR00844	0519	PR06272009	BURDEN						150.59
06/27/09	51100.01.00080.000	PR00844	0531	PR06272009	LABOR EXPE						1,567.03
07/04/09	51202.01.00080.000	PR00848	0428	PR07042009	BURDEN						121.57
07/04/09	51213.01.00080.000	PR00848	0429	PR07042009	BURDEN						308.66
07/04/09	51232.01.00080.000	PR00848	0430	PR07042009	BURDEN						91.93
07/04/09	51100.01.00080.000	PR00848	0440	PR07042009	LABOR EXPE						956.72
07/11/09	51202.01.00080.000	PR00849	0522	PR07112009	BURDEN						303.93
07/11/09	51213.01.00080.000	PR00849	0523	PR07112009	BURDEN						771.66
07/11/09	51232.01.00080.000	PR00849	0524	PR07112009	BURDEN						159.02
07/11/09	51100.01.00080.000	PR00849	0532	PR07112009	LABOR EXPE						2,078.37
07/18/09	51202.01.00080.000	PR00850	0447	PR07182009	BURDEN						430.28
07/18/09	51213.01.00080.000	PR00850	0448	PR07182009	BURDEN						1,087.34
07/18/09	51232.01.00080.000	PR00850	0449	PR07182009	BURDEN						248.53
07/18/09	51100.01.00080.000	PR00850	0458	PR07182009	LABOR EXPE						3,193.35
07/25/09	51202.01.00080.000	PR00854	0464	PR07252009	BURDEN						281.82
07/25/09	51213.01.00080.000	PR00854	0465	PR07252009	BURDEN						715.53
07/25/09	51232.01.00080.000	PR00854	0466	PR07252009	BURDEN						157.74
07/25/09	51100.01.00080.000	PR00854	0475	PR07252009	LABOR EXPE						2,061.89
08/01/09	51202.01.00080.000	PR00855	0459	PR08012009	BURDEN						182.35
08/01/09	51213.01.00080.000	PR00855	0460	PR08012009	BURDEN						462.99
08/01/09	51232.01.00080.000	PR00855	0461	PR08012009	BURDEN						104.73
08/01/09	51100.01.00080.000	PR00855	0469	PR08012009	LABOR EXPE						1,369.10
08/08/09	51202.01.00080.000	PR00856	0453	PR08082009	BURDEN						60.79

EXHIBIT D

QAP

GENERAL CONTRACTORS

240 W. 68th Avenue, Anchorage, Alaska 99518

Telephone (907) 522-2211 Fax (907) 344-5798

August 13, 2009

Mr. John Williams
Construction Manager III
Integrated Concepts & Research Corporation
421 West Post Ave.
Anchorage, AK 99501

Re: Construction Recovery Schedule Summary of Changes
Port of Anchorage North Expansion
Project No. 3404-1-C170
Letter No. 113

Dear Mr. Williams,

Please see the enclosed letter from MKB regarding a summary of changes to the recovery schedule submitted 7/31/09. This letter is intended to further clarify the previously submitted schedule. If there are any questions, please contact our office at 865-5971 or by email at tdudley@colaska.com.

Thank you,

Max Vockner
QAP Project Engineer

MKB CONSTRUCTORS

t: 425.285.0593 f: 425.285.0641

12735 Willows Road NE, Kirkland, WA 98034

mkbconstructors.com

Tim Dudley
Quality Asphalt Paving
240 W. 68th Avenue
Anchorage, AK 99518

August 11, 2009

Re: Port of Anchorage Expansion Project
2008 Marine Terminal Redevelopment

Subject: Schedule Update

Gentlemen;

Attached you will find our schedule update previously provided to you on July 31, 2009. In accord with the section 6.7.3 following are the changes to the schedule.

1. Revised extended tail wall sequence. Our original schedule was based on completing the cell structures from the face wall to the intermediate anchor as one operation and the extended tail walls as a separate operation based on discussions last year with ICRC and its engineer. This allowed the face and intermediate anchor wall to progress independently along the wall and allowed the extended tail walls to be a non-critical path activity. The site conditions require that the extended tail walls be installed as an aid to mitigate the movement of the wye piles during construction. Based on the current work plan the extended tail walls are now identified as critical path activities.
2. WYE location. Critical path work was suspended for a period of 7 days as a result of the wye movement issue.
3. Less available daylight than plan. We are experiencing a loss of 3 hours per day of the anticipated pile driving work window defined in the contract documents.
4. Start up delay. The project was delayed due to changes in the marine mammal protection program.
5. Daily shut down delays associated with the revised MMO plan have impacted our schedule.
6. During the period of May 1 to July 15 the MMO requirements stated that visibility was required ½ hour prior to start up of driving operations. This delayed the project.
7. The increase radius in the MMO will delay the work due to decreased visibility based on the additional distance required for observation.
8. Additional typical cell. We have included the two weeks of schedule time to construct the additional typical cell requested by ICRC.

The aforementioned delays do not consider the resulting impacts to the schedule due to issues such as rescheduling of work, extended scheduled overtime, learning curve losses due to new crew, crowding of work areas, etc. Additionally we have not addressed the schedule impacts due to the hard driving issue which the soils movement issue is a contributing factor. Attached you will find a breakdown of the delays identified to date.

As we have previously stated we are accelerating work as much as practical within the physical and time constraints of the project and will keep you informed of our progress in that regard.

If you have any questions please contact me.

Sincerely,
MKB Constructors

Andrew Romine
Alaska Regional Manager

Schedule Delays Incorporated

Description	Delay	Hrs	*Equiv May June/July Day	**Equiv Oct Day	
Revised extended tailwall sequence	42	762.72	43.2	101.7	Using 18.16 hrs per day average for May-Oct
WYE location	7	142.1	8.0	18.9	Using 20:18 hrs per day average for May
Less available daylight than plan		463.5	26.2	61.8	May-July 64.5 days plus Aug-Oct 90 days
MMO Changes					
Start up - MMO Delay	9	108	6.1	14.4	
Misc MMO Delays		16	0.9	2.1	
1/2 hour Visibility prior to start		26	1.5	3.5	May 1 to July 15, 52 days at 1/2 hour
Increased Radius-MMO Change		105	5.9	14.0	July 15-Oct 105 days estimated 1 hour
		1623.32	91.9	216.4	
			14.4	34.0	MMO Changes/October Equiv Days
			77.5		Delays to 2010

* May/June/July days based on actual estimated unrestricted daylight time available at 17.66 hours per day

**October days based on actual estimated unrestricted daylight time available of 7.5 hours per day

EXHIBIT E

Please see rear binder cover for folded schedule attachement

Note:
White bars indicate original schedule dates
Black bars indicate most recent schedule dates
Dates to the right of bars show early finish dates

EXHIBIT F

Winter 2008/2009		Hourly Cost	200 hr/month	Monthly Cost
Office Overhead				
	Office			$ 1,700.00
	Power			$ 170.00
	Water			$ 120.00
	Gas			$ 100.00
	Trash			$ 155.00
	Portapotty			$ 500.00
	Phone / Internet			$ 240.00
	Intern	$ -	0	$ -
	Secretary	$ -	0	$ -
	Project Engineer	$ 43.05	200	$ 8,610.00
	Pick up	$ 14.81	200	$ 2,962.00
	Foreman	$ -	0	$ -
	Pick up	$ -	0	$ -
	QC Technician	$ -	0	$ -
	Pick up	$ -	0	$ -
	Superintendent	$ 59.69	200	$ 11,938.00
	Pick up	$ 15.16	200	$ 3,032.00
	Project Manager	$ -	0	$ -
	Pick up	$ -	0	$ -
			Total Monthly Cost	**$ 29,527.00**

Summer 2009		Hourly Cost	270 hr/month	Monthly Cost
Office Overhead				
	Office			$ 1,700.00
	Power			$ 170.00
	Water			$ 120.00
	Gas			$ 100.00
	Trash			$ 155.00
	Portapotty			$ 500.00
	Phone / Internet			$ 240.00
	Intern	$ 18.19	270	$ 4,911.30
	Secretary	$ 28.08	270	$ 7,581.60
	Project Engineer	$ 44.92	270	$ 12,128.40
	Pick up	$ 14.81	270	$ 3,998.70
6- 12hr days	Day Foreman	$ 49.62	312	$ 15,481.44
6- 12hr days	Pick up	$ 15.16	312	$ 4,729.92
6- 12hr days	Night Forman	$ 49.62	312	$ 15,481.44
6- 12hr days	Pick up	$ 15.16	312	$ 4,729.92
	QC Technician	$ 44.92	270	$ 12,128.40
	Pick up	$ 14.81	270	$ 3,998.70
	Superintendent	$ 63.62	270	$ 17,177.40
	Pick up	$ 15.16	270	$ 4,093.20
	Project Manager	$ 82.26	270	$ 22,210.20
	Pick up	$ 15.16	270	$ 4,093.20
			Total Monthly Cost	**$ 135,728.82**
	Extra Work			
	Shannon & Wilson	through 8/12/2009		$ 98,299.00
	Assist MKB	through 8/12/2009		$ 44,616.00

EXHIBIT G

QAP
Port of Anchorage Claim
Based on Eichleay Basic Formula

Total POA Contract Billing		**55,048,549**
Total QAP Company Billing		**138,109,000**
		39.9%
QAP Regional G&A		2,676,000
Corporate G&A Alloc		2,315,000
Construction Super		5,468,000
Total Overhead		10,459,000
Total Allocable Overhead	$	4,168,829
Project Days		794
Start Date		5/1/2008
Completion Date		7/15/2010
Allocable Ovhd/Day	**$**	**5,250.41**
Project Claim Days		**60**
Total Allocable Overhead Claim	**$**	**315,025**

Scenario is based on 2009 Contract and Company Billings for the year.

Activity ID	Activity Description	Orig Dur	Rem Dur	%	Early Start	Early Finish
MKB Constructors						
Barge Berth						
D1 170	Wet Barge Berth Vibracomp. 10' spacing OC	70	105	95	22APR09A	07AUG09
D1 590	Complete Cells 36-38	40	165	49	11MAY09A	30OCT09
North Extension						
D1 110	Cells 6-32 to intermediate piles	126	165	55	13APR09A	30OCT09
D1 190	Cells 6-32 Extended Tailwalls	55	165	44	25MAY09A	30OCT09
D1 150	Cells 41-66 to intermediate pile	90	165	54	19APR09A	30OCT09
D1 200	Cells 41-66 Extended Tailwalls	77	165	44	25MAY09A	30OCT09
D1 140	Cells 40-34	22	22	0	11AUG09	09SEP09
D1 360	Cells 40-34 Extended Tailwalls	22	22	0	11AUG09	09SEP09
D1 400	Vibrocompaction Cells 6-32 & 41-66	71	65	0	10AUG09	06NOV09
D1 300	Cells 5-1 Extended Tailwalls	30	30	0	29APR10	09JUN10
D1 100	Cells 5-1 to intermediate piles	30	30	0	29APR10	09JUN10

Activity ID	Activity Description	Orig Dur	Rem Dur	%	Early Start	Early Finish
D1 450	Vibrocompaction Remaining, Cells 1-5	40	40	0	07MAY10	01JUL10
D1 600	Cell 33 Outfall	10	10	0	10JUN10	23JUN10
D1 610	BB Outfall Cell Closure	10	10	0	10JUN10	23JUN10
D1 570	Instrumentation	85	125	76	20APR09A	04SEP09
QAP						
Barge Berth						
D1 280	1st Barge of Sheetpiling	5	0	100	06APR09A	10APR09A
D1 320	2nd Barge of Sheetpiling	5	0	100	20APR09A	24APR09A
D1 270	Backfill Barge Berth	5	0	100	24MAY09A	20MAR09A
D1 540	Barge Berth Interim Completion Date	0	0	0		01JUN09*
D1 330	Concrete Barriers	1	1	0	10AUG09	10AUG09
D1 340	Coir Logs	1	1	0	10AUG09	10AUG09
D1 310	Stormdrain WBB	3	3	0	11AUG09	13AUG09

Activity ID	Activity Description	Orig Dur	Rem Dur	%	Early Start	Early Finish
D1 350	Barge Berth Punch List	5	5	0	14AUG09	20AUG09
D1 290	Ex Digout Rip Rap Placement	5	5	0	21AUG09	27AUG09
North Extension						
D1 500	Granular Fill / Finish	125	165	60	23MAR09A	30OCT09
D1 380	Rip Rap S. End North Extension	5	5	0	02NOV09	06NOV09
D1 130	Outfall Work QAP	11	11	0	10JUN10	24JUN10
D1 370	Rip Rap Outfalls & Stormdrains	5	5	0	25JUN10	01JUL10
D1 640	Granular Fill / Finish	5	5	0	02JUL10	08JUL10
D1 530	Stormdrain	5	5	0	25JUN10	01JUL10
D1 500	Concrete Barriers	3	3	0	25JUN10	29JUN10
D1 490	Coir Logs	2	2	0	30JUN10	01JUL10
D1 410	Sheetpile Splicing	91	114	88	26MAR09A	20AUG09
D1 290	Backfill Crane Pad	10	0	100	27MAR09A	08APR09A

Activity ID	Activity Description	Orig Dur	Rem Dur	%	Early Start	Early Finish
D1 260	Galvanizing Sheetpile Complete	0	0	100		06APR09A
NEBP						
D1 470	NEBP Mobe	5	0	100	16MAR09A	20MAR09A
D1 480	NEBP Reclamation	5	5	0	25JUN10	01JUL10
PJCT						
D1 460	2009 POA Construction Start	0	0	0	16MAR09A	
D1 390	SWPPP	165	335	30	17MAR09A	25JUN10
D1 440	Whale Watchers	136	335	30	17MAR09A	25JUN10
D1 420	Dig Permit	6	0	100	16MAR09A	10APR09A
D1 430	Spring Drainage Issues	6	0	100	27MAR09A	10APR09A
D1 550	Substantial Completion 1 (Cells 8-32 & 41-65)	0	0	0		31AUG09*
D1 560	Substantial Completion 2 Cells1-7,34-40,Outfalls	0	0	0		21SEP09*
D1 620	WINTER	123	123	0	09NOV09*	28APR10

Activity ID	Activity Description	Orig Dur	Rem Dur	%	Early Start	Early Finish
D1 630	Substantial Completion Cells 35-66, 6-32	0	0	0		30NOV09*
D1 510	Demobilization	5	5	0	09JUL10	15JUL10
D1 520	Final Completion	0	0	0		15JUL10*

Delays for cells 35,37,38 are from extremely hard driving. All jetting attempts to date have failed to provide relief.

Delays to North Extension cell completion caused by; changing sequence of work to complete extended tailwall of each cell before starting next cell, extremely hard drving issues, soil movement issues.

ICRC suggested that MKB should focus on the completion of cells 32-66 to mitigate delays to upcoming outside contracts.

Delays to vibracompaction is attributable to unanticipated equipment failures to highly specialized equipment.

Work that is schedule for 2010 is delayed due to not being able to work during a winter shutdown.

These activities cannot be finished until the MKB can finish driving cells 36,37,38 to an acceptable elevation so these activites are delayed until completion of cell 36,37,38.

QAP is delayed in its activities pertaining to the North extension as QAP's work comes after MKB has driven cells to grade. QAP's delays are a direct result of MKB delays. QAP planned durations have not increased but have only been delayed.

SWPPP is an activity required by the contract that continues as long as the project is being actively worked.

Whale watching is an activity that is required under contract that is concurrent with in water (ocean) work.

A winter shutdown results in a period of time in which in water work is physically not able to take place do to contractual reasons. The exact time of winter is only a loose estimation and may be subject to change due to seasonal affects.

Start Date 19NOV08
Finish Date 15JUL10
Data Date 03AUG09
Run Date 25AUG09 12:38

Early Bar
Target Bar
Progress Bar
Critical Activity

POAS — Sheet 5A of 5B

QAP

POA Expansion 2008-2009

Classic Schedule Layout

Date	Revision	Checked	Approved

19NOV08
15JUL10
03AUG09
25AUG09 12:38

Early Bar
Target Bar
Progress Bar
Critical Activity

Primavera Systems, Inc.

POAS — Sheet 5B of 5B

QAP

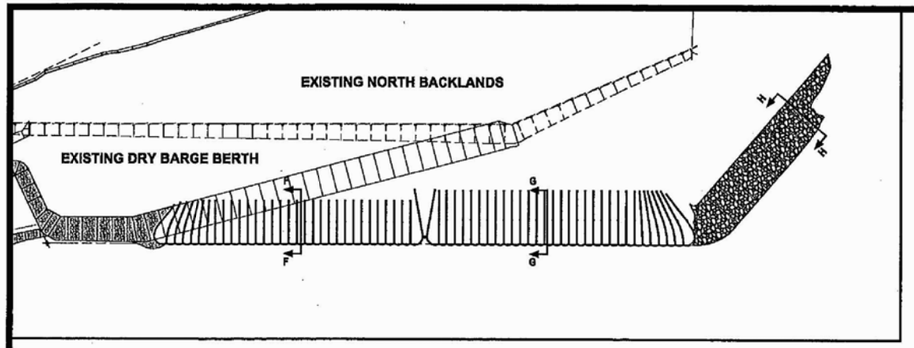
POA Expansion 2008-2009

Classic Schedule Layout

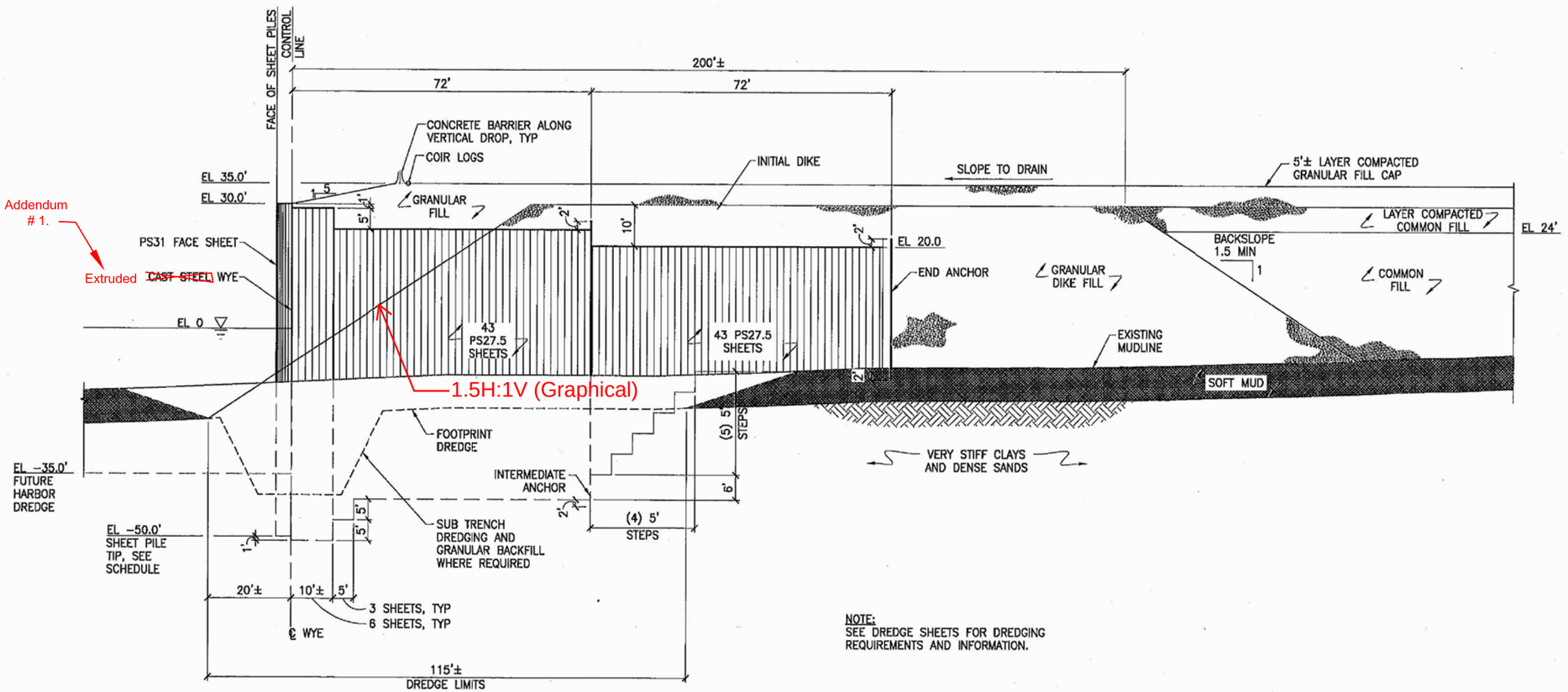
Date	Revision	Checked	Approved

Item H16:

North Extension Cross Section Conformed Drawings



KEY PLAN



NOTE:
SEE DREDGE SHEETS FOR DREDGING REQUIREMENTS AND INFORMATION.

TYPICAL SECTION F-F

OPEN CELL PATENT #6,715,694

100% DRAWINGS
NOVEMBER, 2007

ICRC
421 West First Avenue, Suite 200
Anchorage, Alaska 99501
(907) 561-4272
www.icrcsolutions.com

Anchorage Port Expansion Team

REV	DATE	DESCRIPTION

STATE OF ALASKA — 49TH — No. 1204-CE — REGISTERED PROFESSIONAL ENGINEER

DATE: 11/8/2007

CONFORMED DRAWINGS 09 DEC 08

1506 West 36th Avenue
Anchorage, Alaska 99503
Phone: 907.561.1011
Fax: 907.563.4220
www.pndengineers.com

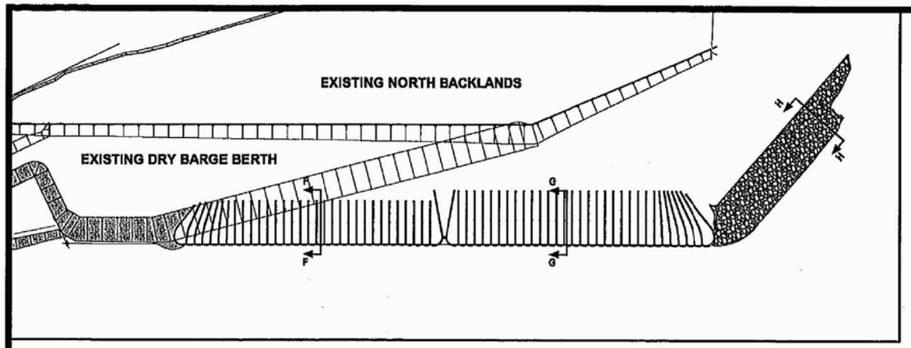
P N D
ENGINEERS, INC.

PROJECT: PORT OF ANCHORAGE EXPANSION PROJECT

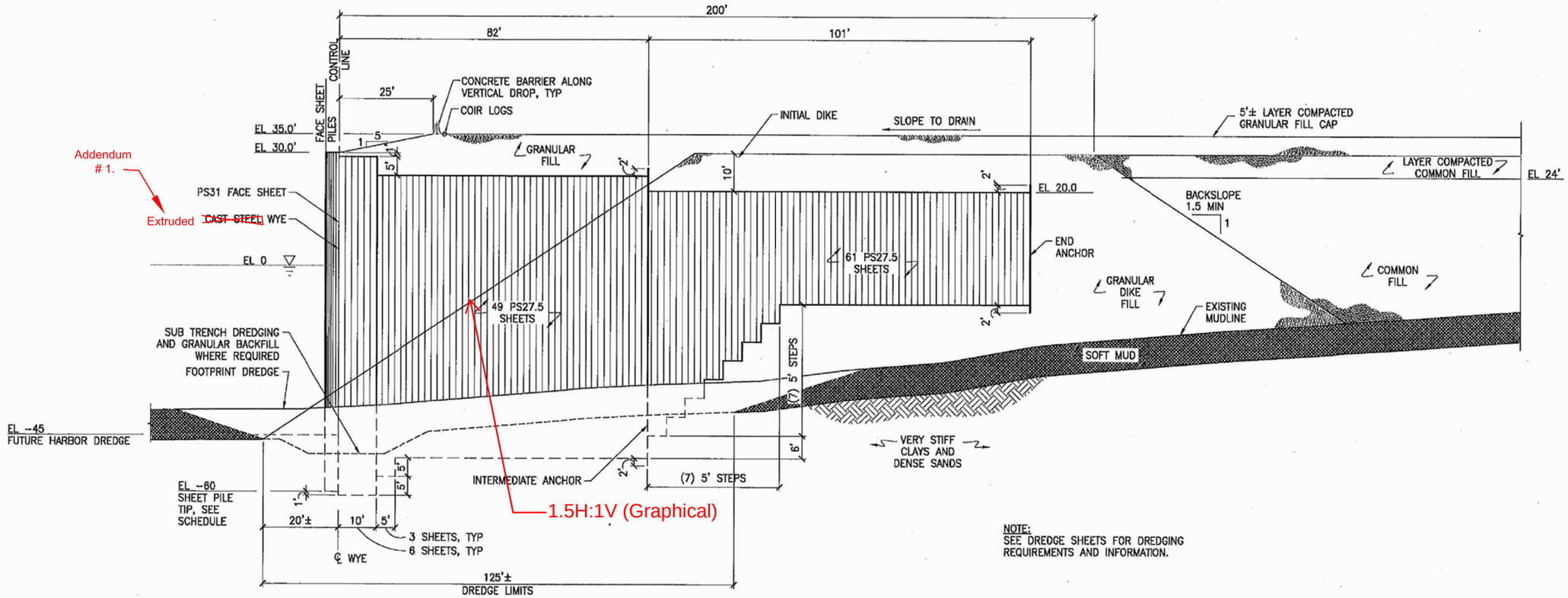
TITLE: NORTH EXTENSION TYPICAL SECTION F-F

DESIGNED BY:	GH	DATE:	11/8/07
CHECKED BY:	DN	PROJECT NO:	61028

SHEET NO: 15 OF 38



KEY PLAN



NOTE:
SEE DREDGE SHEETS FOR DREDGING REQUIREMENTS AND INFORMATION.

TYPICAL SECTION G-G

OPEN CELL PATENT #6,715,594

100% DRAWINGS
NOVEMBER, 2007

ICRC
Anchorage Port Expansion Team
421 West First Avenue, Suite 200
Anchorage, Alaska 99501
(907) 561-4272
www.icrcsolutions.com

REV	DATE	DESCRIPTION

CONFORMED DRAWINGS
09 DEC 08

DATE: 11/8/2007

1506 West 36th Avenue
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www.pndengineers.com
PND ENGINEERS, INC.

PROJECT: PORT OF ANCHORAGE EXPANSION PROJECT

TITLE: NORTH EXTENSION TYPICAL SECTION G-G

DESIGNED BY:	GH	DATE:	11/8/07
CHECKED BY:	DN	PROJECT NO:	61028

SHEET NO: 16 OF 38

Item H17:

Port of Anchorage Expansion Project, Draft Report on Sheet Pile Driving Problems for MKB Constructors

Port of Anchorage, Alaska – Expansion Project

Report on Sheet Pile Driving Problems for MKB Constructors

Anchorage, Alaska

Lachel Reference # 10366008.00
January 11, 2011

SUBJECT TO ER 408

Lachel & Associates
A SCHNABEL ENGINEERING COMPANY

PORT OF ANCHORAGE, ALASKA – EXPANSION PROJECT
REPORT ON SHEET PILE DRIVING PROBLEMS FOR MKB CONSTRUCTORS

TABLE OF CONTENTS

LIST OF FIGURES

Port of Anchorage, Alaska – Expansion Project
Report on Sheet Pile Driving Problems for MKB Constructors

I. INTRODUCTION

A. **Purpose of Report** - The purpose of this report is document a review by Lachel & Associates, Inc. of geotechnical and construction information related to problems experienced with installation of steel sheet piling by MKB Constructors at the Port of Anchorage Marine Terminal Redevelopment Project in Anchorage, Alaska. MKB was a subcontractor to Quality Asphalt Paving (QAP) for installation of an Open Cell Sheet Pile (OSCP) bulkhead at the Port and for vibracompaction of granular cell fill that would be placed in the completed bulkhead cells by QAP. QAP held a contract with ICRC, the design/build prime contractor for earthwork and sheet pile bulkhead portions of the Port expansion. The OSCP design concept is patented by PND Engineers, who served as ICRC's designer for the project. Two specific sets of bid documents describe the construction that is the subject of this review, namely that of the Barge Berth Phase 2 and of the North Extension, together involving installation of more than 100 sheet pile cells.

B. **Background** - MKB experienced extreme difficulties in sheet pile installation due to a combination of causes including hard foundation soils, movement of fill soils during sheet pile driving, undisclosed rock obstructions in the subsurface at locations affecting sheet pile driving, and also due to administrative restrictions related to environmental compliance which imposed various constraints on their work. Ultimately, their contract was terminated and their remaining work was de-scoped. Completion of the sheet pile bulkhead installation was re-bid in April 2010 with a revised set of bid documents. MKB is seeking compensation for their work, including increased costs that they incurred because of the problems.

C. **Scope of Review** - The review documented herein is based on the project documents including the bid documents for the project elements in question, and on design documentation available on the Port of Anchorage. The report contains references to specific portions of the documents that are quoted, and a reference list containing documentation of other material cited in support of the discussion contained herein. Emphasis is given to discussion of potential causes of soil movement and to discussion of various aspects of constructability of the project as presented in the bid documents. This report addresses geotechnical and construction aspects of the problems, and does not address cost or schedule issues. It contains the following sections:

- Assessment of Soil Movement
- Design Configuration and Construction Specifications
- Construction Aspects
- Conclusions

D. **Limitations** - Lachel & Associates, Inc. services are performed, within the limitations imposed by the firm's clients, using the degree of care and skill ordinarily exercised under similar circumstances by reputable engineers and geologists practicing in this or a similar locality. No other warranty or representation, either expressed or implied, is made as to the findings and professional opinions rendered in this report.

The findings and recommendations in this report represent our professional opinion based on a general review of available information. However, it should be recognized that other items may exist that have not been specifically identified. Any changed conditions and additional information should be brought promptly to the attention of Lachel & Associates, Inc. for evaluation. Changes to the opinions, conclusions and findings, presented herein may be needed.

The conclusions and findings presented in this report were developed specifically for this project and do not necessarily apply to any other site or project. This report is intended for the sole use of MKB Constructors and their agents. The scope of services performed in the execution of this effort may not be appropriate to satisfy the needs of other users, and any use of this document or the findings, conclusions, or recommendation presented herein is at the sole risk of the said user. If the nature of the project changes significantly from that described in this report, Lachel & Associates, Inc. should be contacted to confirm the validity of these conclusions and findings.

II. ASSESSMENT OF SOIL MOVEMENT

A. **Global Stability** - The possibility of movement in the underlying soil being a contributor to the down-slope movement of soil material was initially suspected and inclinometers were installed to assess this through monitoring. There were clear indications of movement in the fill soils with breaks in the observed pattern that coincided with the top and bottom elevations of the extended portion of the tail walls (Shannon and Wilson, 2009). There were minor indications of apparent displacements within the native soils, but they were not pervasive and overall, it does not appear that a global stability mode of failure with a failure surface in the in situ soils is the cause of the observed movement.

B. **Silting In** – Sheet 12, General Note C, first paragraph states, “Footprint dreding shall be performed no more than seven days prior to dike fill placement in any given area. All project dredging shall be approved by ICRC prior to sheet pile being driven.” If the area dredged as part of “footprint dredging” silted in following dredging, it is possible that the presence of a loose unconsolidated layer of fines could have contributed to down-slope movement of soils, as such a layer could potentially form a plane of weakness along which down-slope sliding could occur. Considering other mechanisms that will be discussed below, this could contribute, but would not be necessary for the observed slope instability to occur.

C. **Movement Due to Vibratory Pile Driving** – According to MKB’s Project Manager Andy Romine, sheet piles and wyes typically displace downslope to some extent during driving. Mr. Romine indicated that Tom Glenn, the MKB Superintendent, had previously observed about 2 inches of down-slope displacement on other projects and therefore attempted to adjust accordingly in setting the wyes. The outward movement observed on this project was greater than had previously been observed. It is notable that the wyes described in ICRC Letter #38 of May 22, 2009 as unacceptable by virtue of their positions 1.8 feet and 2.7 feet west of their design location were associated with Cells 10, 11, and 12, the precise location where rock was recovered by West during the 2010 construction season. It is highly likely that these excessive movements were caused by undisclosed rock obstructions that affected the driving of the wyes.

Mr. Romine also reported that compaction of soils adjacent to tail wall sheet piles was observed during driving. This would tend to cause these soils to exert more frictional force on the sheet piles following dissipation of excess pore pressures from vibratory driving. With a greater frictional force at the interface, it is possible that subsequent down-slope movement caused by additional driving could

then have tended to cause down-slope movement of the tail walls, giving rise to some of the observed bucking that occurred after driving. With the fill moving, the buckling of some installed tail walls that was observed is easily understandable, as with sloping fill, different portions of the walls can be subject to varying amounts of frictional forces.

Once the fill starts moving, it will exert frictional forces on the sheet piles and tend to cause iron binding, particularly with the piles toed into the hard soils of the Bootlegger Cove Formation (BCF). In this case, it appears that the movement was extensive because of the oversteepened slopes of the anticipated dike configuration and the relatively large depths of fill through which sheet piles were driven on this project. The resulting iron binding was severe.

D. **Feasible Fill Slope Angle** – Typical Sections F-F and G-G, as shown on Drawing Sheets 15 and 16 depict a fill slope for the "initial dike" or work platform that intersects "very stiff clays and dense sands" of the BCF as exposed by footprint dredging, with the toe of the proposed slope shown as 20 feet +/- seaward from the bulkhead control line. The slope angle depicted measures about 33 degrees, a slope of one foot vertical per 1.54 feet horizontal (1 in 1.54). Sections F-F and G-G, as shown in the drawing set are reproduced as Figures 1 and 2 of this report.

ICRC's Letter #38 of May 22, 2008 expresses that ICRC and the designer attribute the driving problems to the slope creeping downslope during construction, causing a ***"…buildup of fill in contact with the sheet piles not anticipated in design. Soil pressure on the back of the face sheet piles may result in iron binding within the pile interlocks resulting in difficult driving."*** ICRC then provided the following suggestion to ease driving difficulties: ***"Re-evaluation of your means and methods for construction of the crane pad and associated slopes appears prudent. Pulling back the slope from the cell face appears prudent. This may be accomplished with the proper equipment including a dragline or hydraulic excavator with sufficient reach or by construction of a bench into the slope to provide equipment access. Physical means such as geobags, geotextile, geogrid or other means may also be considered to stabilize the steepened slopes."*** This is expressed in the overall context of attributing the problems to the contractor's means and methods, and appears to reflect a mistaken understanding of the stable slope angle.

The designed work platform depicted in the bid documents should not have been expected by the designers to be stable during construction. Table 4-3 of the March 2008 Geotechnical Analysis Report by PND presents fill properties for uncompacted and compacted granular fill, with the angle of internal friction, φ, for these two conditions as 32^{o} and 36^{o}, respectively. As vibracompaction was not contemplated in the design as occurring until after cell completion, the value of 32^{o} is taken as representative of conditions during construction. Section 5.4.1 of the same report describes the design phreatic level within the fill as elevation +18 feet. (The term "phreatic level" describes the level at which the pressure in the groundwater is equal to atmospheric pressure, and below which the soil is saturated.)

The stable slope angle is a function of the angle of internal friction of the soil and of the position of the phreatic level. Above the phreatic level, a slope will be stable under static conditions, provided that the slope angle or angle of inclination to the horizontal, β, is less than φ. Below the phreatic level, where the slope is saturated, it can be found in soil mechanics texts that the stable slope angle is approximately half the internal friction angle. Thus, in this case, below elevation +18, the stable slope angle would be approximately half of 32^{o}, or 16^{o} (~1 in 3.5). This is simplified, and a more rigorous analysis would examine the transient flow pattern of the groundwater in response to the tidal cycle, which during some intervals would show an even flatter stable slope angle.

Under natural conditions, an oversteepened slope in granular soil will gradually slough at the surface until the slope angle flattens to its characteristic stable value. This can take a substantial amount of time, particularly if the soil is gravelly because of the greater mass of the individual particles and their interlocking. However, vibration accelerates this process, as is well known and leads to the application of vibratory processes to densify cohesionless soils, particularly when saturated (below the phreatic level).

In this case, since construction involved extensive vibration during sheet pile driving, it should have been recognized that the stable slope angle below elevation +18 is approximately 16^{o} or less. This configuration is shown superimposed on Sections F-F and G-G in Figures 1 and 2, up to elevation +18, with a slope angle of 32^{o} above that level. Had this been shown on the construction drawings, the dike top would have been so far back from the control line that driving from land would have clearly not been feasible and the whole concept of the work platform as expressed in the General Notes would have been meaningless. (This was apparently recognized by the time of issuance of the plans for the North Extension Bulkhead Project on April 9, 2010, as the concept of the work platform is absent from the revised plans and pulling soil back from the slope is required in the revised General Notes.)

That the designer did not take acknowledge the behavior described above is further clearly indicated in the minutes of the May 19, 2009 meeting regarding wye locations. On the first page, Dennis Nottingham of PND described the problem as, ***"…it's loose soil sliding; you need to densify it; put a few vibratory probes down and solid it up."*** Tim Dudley of QAP stated that the slope flattens to between 1 in 3 and 1 in 4 over the winter (which agrees with the analysis presented above). On Page 5, Dennis Nottingham stated with confidence that the slope would stand at 1 on 2 (26.6^{o}), saying, ***"…trust me, we've done it for years."*** He further stated that that the slope at Port Mackenzie had worked at that configuration ***"…in exactly the same conditions."*** The 1 on 2 slope (26.6^{o}) is also shown with the work platform slope configuration form the bid documents and the 16^{o} slope described above for comparative purposes on Figures 1 and 2. Several items are noted from these statements and details of the Port Mackenzie project:

- Densification is here proposed as possibly required for construction preceding cell completion and filling, contrary to the requirements of the bid documents to do it upon completion of cell filling.
- A slope configuration of 1 vertical on 2 horizontal (slope angle of 26.6^{o}), is expressed as being stable based on experience. This is not supportable based on the above analysis.
- It should be noted that Port Mackenzie involved sheets 70 feet in length, and that there was no fill at the dock face. Rather the face sheets were driven directly into in situ soils. The Port Mackenzie configuration is shown as Figure 3, and is also shown superimposed on the Port of Anchorage configuration in Figures 4 and 5. The clear difference in scale between the two applications is apparent, particularly for the portion of the facility represented by Section G-G.
- Port Mackenzie was constructed under icing conditions, as shown below from a slide in PND's May 27, 2008 presentation to the Geotechnical Advisory Committee, as obtained from the Port's web site. It is a matter of record that significant ice formed in the fill and gave rise to settlement the following year when the ice melted. Such icing could certainly help to temporarily hold the slope at an angle steeper than its natural stable angle.

It should also be noted that during meetings and in correspondence, ICRC and PND frequently described ***"…pulling the slope back from the cell face…"*** as something that installation means and methods should incorporate. This is simply another way of saying that MKB should have excavated the design work platform until the slope was stable. This may sound simple, but the soil volume that would be removed in excavating to reach a stable configuration is huge. Two additional handlings of this amount of material (excavate to pull back slope, and then replace) clearly could not have been accommodated within the project schedule, and clearly no prudent contractor would contemplate having to do this to accomplish the work.

It is interesting for comparison purposes that in the John French declaration (French, 2011), it is documented that the U. S. Army Corps of Engineers directed West to reduce the fill slope from 1 on 1.5 (33^{o}) to 1 on 4 (14^{o}) to prevent further migration of fill soils. It had been found that significant and unexpected quantities of materials were found seaward of the bulkhead by the harbor dredging contractor. This is similar to the 16^{o} slope described above and supports the assertion made herein that the 1 on 1.5 and 1 on 2 slopes from the bid documents and PND statements in meeting minutes are fundamentally not stable below elevation +18. The "migration" of fill soils appears to describe the result of the slope progressively failing to reach a stable configuration and flattening in the process.

III. DESIGN CONFIGURATION AND CONSTRUCTION SPECIFICATIONS

This section addresses some features of the design configuration as expressed in the design drawing set, and the construction specifications, as they were expressed as General Notes on Sheets 3-7 of the drawing sets for the Barge Berths Phase 2 and the North Extension projects. Unless described otherwise for a specific case, these comments address the North Extension plans and notes.

A. **Work Platform** - The creation of a "work platform" was clearly anticipated in the project design, as described in General Note 4.A.2 on Sheet 4, and as shown as "Granular Fill Dike" and "Initial Dike" on Sheets 14-16. The seaward slope of the dike is shown at 32 to 33 degrees, representing a slope of 1 vertical to 1.5-1.6 horizontal. This was performed by dumping fill and spreading it downslope with a bulldozer to the extent permitted by tidal fluctuations. Material seaward of the line described by the low tide level was of necessity placed through water. The "work platform" was clearly intended by PND to support a crane used to drive sheet piling, as evidenced by the statement in the meeting notes for the May 21, 2008 project meeting, Item 7.d – Fill plan – What is required – "GH PND

provided clarification stamped plan required primarily due to structural requirements of dike to support pile driving equipment."

B. **Dredging** - Along with the creation of the dike, dredging was performed within a defined footprint below a portion of the work platform, referred to as "soft-soil footprint dredging to bucket refusal" (80,000 pound, 14 cubic yard bucket) in notes on Sheet 12. This dredging work was discussed in the March 2008 Geotechnical Analysis Report by PND, using the terminology "soft estuarine sediments" to describe "looser soil layers" that would be dredged and replaced with granular fill "to improve resistance to sliding."

Sheet 12 also describes "hard soil dredging" or "sub-trench dredging" to elevation -40 ft toward the north end of the facility and -50 ft toward the sound end of the facility, using an 80,000 pound, 7 cubic yard bucket. These elevations are 10 feet above the design tip elevation of the face sheet piles for Section F-F and Section G-G of Sheets 14-16. Further, Sheet 12 of the drawing set does not detail the refilling of the sub-trench with granular material, but it appears from Sections F-F and G-G that the dredged trench would be filled with the granular fill material as described in General Note 3.A.1 on Sheet 3.

The purpose of the sub-trench dredging is not described in the March 2008 Geotechnical Analysis Report, but is addressed by Terracon in their instrumentation and monitoring report of January 2010, in the statement, "Difficult driving was anticipated for some areas along the north extension. In order to reduce difficult driving, a sub-trench was dredged along the alignment of the cell face." Also notable is that the sub-trench did not extend northward through the extent of North Extension cells 1-8. Although the designer's rationale for this is not known, it appears that it may have reflected reluctance to dredge a deep trench too close to the existing slope of the Dry Barge Berth Dike. If dredging was required to mitigate difficult driving conditions for the cells from this point southward, then not dredging here would potentially set up extremely difficult and potentially unachievable driving conditions in this interval.

C. **Sheet Pile Penetration** - Based on the design configuration of the sheet pile cells and tail walls, and the dike slope associated with the "work platform" as shown on the design drawings, the driving of sheet piling through substantial thicknesses of granular fill soils and well into the overconsolidated silt and clay with numerous interbedded layers of sand, silty sand, and gravel of the Bootlegger Cover Formation (BCF) was required. Penetration into the BCF soils is generally 10 to 20 feet, after first penetrating fill thicknesses of 20 to 30 feet at the dock face, and increasing to 40 feet or more at the top height of the work platform dike.

D. **Obstructions** - The drawings clearly contemplated the possibility of obstructions causing difficulties with sheet pile installation. Sheet 12, Note 4.D, second paragraph, states, "Contractor shall remove rock or other obstructions under the footprint prior to driving sheets. Contractor shall not place anything in the sheet pile footprint that sheet pile cannot be driven through. Contractor's fill in the sheet pile footprint shall be acceptable to ICRC prior to driving sheet piles." No equivalent note was included in the General Notes for the Barge Berth drawing set.

The bid documents including the results of geotechnical explorations were reviewed seeking indications of obstructions within the construction area for the North Extension. This included Terracon Borings TB-56, TB-25, and TB-28 inland of the dock face, and TB-56 at the dock face, as well as Terracon CPT's along the dock face including TB-54. TB-55, TB-57, TB-01, TB-02, and TB-03. Also, pile probing using H-pile sections advanced by means of a vibratory pile hammer was

performed in 2007 and presented on Sheet 36 of the drawing set at 29 locations, designated A through Z and AA through CC. The probes were advanced to elevation -60 or to refusal, and only 3 probes (N, O, and R) were described to have encountered rock causing refusal. Of the borings, none included description of any rock materials larger than gravel ½" to ¾" in dimension within the driving elevation ranges for proposed sheet piling. For the CPT's, some intervals were drilled out because the CPT could not advance. This is not uncommon and considering the small size of the CPT probe, can be caused by gravelly zones. Thus, it cannot be claimed as indicative of boulder obstructions. Thus, the bid documents do not present any information that suggests that encountering obstructions during sheet pile driving should be anything other than a random and occasional occurrence.

E. **Densification of Fill** - Densification of cell fill to improve the state of compaction and thereby the resistance to liquefaction due to shaking from earthquakes was not planned until after cell construction and filling. General Note 4.A.2 on Sheet 12 states in part, "Upon completion of the open cell sheet pile bulkhead and filling, the fill will be deep compacted by vibracompaction." The logical consequence of this construction sequence is that at least portions of the fill would be in a relatively loose state of compaction at the time of sheet pile installation. This would apply particularly to the granular fill that would have been placed through water to fill the trench created by sub-trench dredging. Settlement of this zone of fill due to vibrations from pile driving would tend to oversteepen the slope immediately landward from it. This would, in turn, contribute to the tendency of the fill above this point to move down slope when vibrated and impose a load on the face sheet piles.

IV. CONSTRUCTION ASPECTS

A. **Vibratory Pile Hammers** - Vibratory hammers became popular because when applied under the proper conditions, they can advance piles more rapidly than can conventional impact hammers. As vibratory pile driving involves localized liquefaction of the soil, permitting pile penetration, it is most effectively applied in soils that are liquefiable, i.e., loose, sandy materials (Swatek, 1970). These hammers are less effective in dense, gravelly soils containing cobbles and in stiff clays. Clay soils tend to dampen vibration of the hammer and retard penetration (EM 1110-2-2906, page 5-11). If vibratory driving is persistently applied under hard driving conditions, the sheet pile interlocks can actually melt (EM 1110-2-2504, page 8-1); thus it is important to shift to impact driving when hard driving is required.

   Another effect of vibratory driving is soil densification, particularly for cohesionless soils that are submerged. When soil on a slope is vibrated, particularly if submerged or partially saturated as would frequently be the case at the Port of Anchorage between high tides, it tends to move down slope and seek a flatter slope angle. This is precisely what was observed, as documented in MKB's May 22, 2009 request for additional utilization of the impact hammer.

B. **Jetting and Spudding** – Jetting and spudding were mentioned in the General Notes, only relative to submittal of pile driving equipment details in support of statements made relative to potential difficult driving conditions and measures that might have to be employed to overcome them. Jetting is the use of water jets attached to advancing piles to liquefy soils and facilitate penetration. Spudding is the driving of a short and stout section of pile-like material into the ground to punch through or break up a hard-ground strata to permit pile driving. When difficulties were encountered, there was discussion and project correspondence related to attempting use of such methods to improve pile driving effectiveness.

Notable among these is the PND letter of December 11, 2008 that was transmitted to QAP by means of ICRC's Letter #021 of December 12, 2008. This letter states in an introductory paragraph that difficult pile driving had been anticipated and that ***"The contractor has been performing pile installation with pile driving alone and is consequently encountering a myriad of problems working out on the edge of what is reasonable with pile driving equipment driving flat sheets. We have recommended that the contractor provide additional means to ease the pile driving."*** The letter concludes with the following statement, ***"Substantively, the problems the contractor is facing is (sic) not improper driving data, the wrong hammer, the wrong analysis, local or Euler buckling of the sheets, the wrong pants, iron binding, or splice problems. All of these problems are the outgrowth of driving piles in hard materials that should probably be weakened by dredging, spudding, drilling, jetting, etc., prior to driving. Tuning up the pile plan could mitigate some of the problems but will not be a cure for all pile installation."***

These statements completely ignore the soil movement that is clearly a significant portion of the problem. Jetting and spudding are sometimes necessary, but they come with large caveats: "When driving is difficult, jetting and spudding may be attempted to facilitate driving or remove obstructions. However, this should be done sparingly because there is a danger that the sheet piles will follow the spudded or jetted holes and will split out of interlock. Jetting is usually not efficient in clay." (LaCroix et al, 1970) Further, "Jetting is normally used when displacement-type piles are required to penetrate strata of dense, cohesionless soils… Piles in some cases, have been successfully jetted in cohesive soils, but clay particles tend to plug the jets" (EM 1110-2-2906, page 5-3).

These processes are costly and time consuming unless used only occasionally to deal with an obstruction. Overall, it would not be reasonable to expect a contractor to bid a sheet pile installation project and plan to employ jetting or spudding as a part of normal production on more than a very small percentage of sheets on a large project such as this. Should such extensive application of these processes be required, it should be stated in the bid documents with the understanding that it would involve a cost increase of significant magnitude.

Apparently, even PND personnel did not agree on the potential efficacy of jetting, as evidenced by Dennis Nottingham's repudiation of the methodology as having any benefit in the dense silt and clay soils of the BCF. This is documented in the minutes of the May 19, 2009 meeting regarding wye locations, ***"DN: Jetting won't work in this soil – Jetting works in sands – that's what jetting is for. Does not work in hard soils like this."*** Thus, there is agreement that the soils are hard, but no agreement that the measures PND proposed would actually be worth the time spent trying to apply them. In the same meeting, Nottingham repeatedly attributed the installation problems to loose soil sliding, a different interpretation of the problem from that described above from the Howlett's December 11, 2008 letter.

C. **Length and Penetration of Sheet Piling** – The sheet piling for the Port of Anchorage (by design) is long, requiring many sheets 80 and 90 feet long to achieve the proposed configuration. As described in Section II.C of this report, the design requires penetrations of 10 to 20 feet into the BCF after penetrating 20 to 40 or more feet of granular fill (or total penetrations of 30 to 60 feet. These are long penetrations considering that the fill and in situ materials are not soft. Penetrations greater than 20 feet are considered to be large (Swatek, 1970), and this is consistent with information presented in a recent ASCE seminar on steel sheet piling sponsored by L. B. Foster, the supplier of sheet piles for this project. It was stated that for flat sheets (such as were used at the Port of Anchorage), driving through more than 20 feet of soil should be avoided because of potential for friction buildup, sheets wandering from design position, and the possibility of encountering obstructions. PND's letter of December 11, 2008, transmitted to QAP by ICRC's letter of December 12, 2008 characterized MKB

as ***"…encountering a myriad of problems working out on the edge of what is reasonable with pile driving equipment driving flat sheets. We have recommended that the contractor provide additional means to ease the pile driving."*** Indeed, the required sheet pile penetrations were out on the edge of what is reasonable, but it was the design that required this, and the difficulties in pile installation cannot be written off to contractor's means and methods.

The specifications (General Note 3.C, 5th paragraph) require a minimum swing angle of +/- 10 degrees at the interlocks. It should be noted that on the L. B. Foster web site, catalogue information for the PS 31 sheet piles used for this project indicate this to be true for sheet piles up to 70 feet in length, with a loss of +/- 1.5 degrees for each additional 10 feet of length. Thus, the 80 and 90 foot long sheet piles required for this project cannot meet the specified value. This reduced swing angle would have the effect of contributing to the iron binding that the moving fill caused.

D. **Obstructions** – As described in Section II.D. above, the bid documents do not contain information that would lead to expectation of significant amounts of hard driving due to obstructions. There is also the clear expectation of removal of man-placed obstructions such as slope protection rock prior to sheet pile driving. As is now known, significant rock remained in the subsurface, and caused MKB to have to spend great amounts of time attempting to drive sheet piling into obstruction-laced ground in spite of their expressed concerns about the conditions. The location of rock removed by West during the 2010 construction season was shown on Attachment G to the Richard Marsh declaration of November 1, 2010, and is attached as Figure 6. This clearly shows that rock was found at the locations of the most difficult driving, i.e., the south end of the Barge Berth and the north end of the North Extension project, and that rock is probable and possible over an even larger area. The attribution by ICRC and PND of MKB's driving difficulties in these zones to the ineffectiveness of their own means and methods was clearly in error.

E. **Remedial Measures Proposed by ICRC and Designers** – During various meetings, and in various items of correspondence, a number of potential remedial measures were proposed by ICRC and the designers to deal with the problems being experienced by MKB. These could all be discussed and analyzed as to their effectiveness, but that is beyond the scope of this report. In general, had the problems been periodic and isolated, and the proposed measures been effective, they would have been reasonable to employ to deal with occasional problems. However, most of the remedial measures involved significant alterations to planned construction sequence and significant expenditure of resources and time. It was not reasonable to expect that such measures could have been applied on a large scale to the production operation for the bid cost. Further, many of them were advanced without recognition of the inherently unstable slope angle of the work platform dike and proved to be ineffective, or to require substantially greater time when implemented.

One specific point regarding proposed remedial measures is that vibracompaction was proposed by PND as a means of stabilizing the fill. Fill densification could be a stabilizing measure if it was sliding due to lack of compaction. However, in this case, it was sliding because the slope angle was steeper than the stable slope angle. Compaction would have increased the angle of internal friction, but that would have had only a small stabilizing effect (increasing the stable slope angle to 18^{o}, from 16^{o}).

F. **Bid Document Differences** – A full analysis of the differences between the original bid documents for the North Extension and the Barge Berth and those for the 2010 RFP for the North Extension Project is beyond the scope of this report. Nevertheless, some comparative comments are warranted.

- The concept of the work platform has been removed from the new bid documents.

- Extensive sections regarding construction sequence have been added to the General Notes.
- The term “obstacle” has been added with the requirement to remove or drill through encountered obstacles for face sheets and the potential to realign tail walls around them.
- A full-time drill rig is required by the new bid documents – capable of drilling to a deoth of 5 feet below sheet pile tip elevations at a minimum diameter of 8 inches.
- It is stated in the new bid documents that drilling is anticipated at wyes, face sheet interlocks, and alternate interlocks on tailwall sheets, and the contractor will be paid for mobilization, and monthly rental, and a per-hole cost. No additional time would be allowed.
- There is a significant section on iron binding, with a statement that it may be increased because of pile coatings. (This should also be considered in conjunction with the reduction in swing angle at the interlocks for piles longer than 70 feet, relative to the basic feasibility of installing piles to the original specification.)
- Flattening of the slope angle during driving is acknowledged and pulling the material back is made a requirement of the specifications.
- Deposition of silt within driven or partially driven cells during high tidal cycles is acknowledged and dredging of any accumulation exceeding one foot is made a requirement of the specifications.
- The requirement to splice piles after full depth driving was added to the new bid documents.
- The requirement in the new bid documents that sheets slide to grade under their own weight when interlocked requires vertical assembly. It further requires that the sheets “shall not bind during driving.” Unless the fill slope is flattened to a stable configuration, this is not likely to be achieved.

In general, the new bid documents describe a different project and a different standard, basically transferring much of the risk for the problems observed during sheet pile driving in 2008 and 2009 to the contractor. Compensation not provided in the original project is available for some items – e.g., drilling at wyes and interlocks.

Regarding pre-drilling, the means of pre-drilling at wye locations and many interlock locations is not clear. A drill rig must be stable to provide down-pressure and and a reaction to the torsional force being applied to drill. This would require some additional fairly extensive infrastructure to permit this to be safely done in the tidal environment. Drills do not necessarily drill straight holes. Considering the normal wander that can occur when drilling in soils that can contain cobbles (small rocks that will pass a 12-inch grid and be retained on a 3-inch grid), predrilling wye locations still might not enable tolerances to be met. If a drill hole does wander, the element driven at the location will likely follow it, which can be problematic in its own right. It is notable that in Paul French’s declaration (French, 2011), he expresses similar concerns regarding feasibility and stated that West did not perform such drilling work. Rather, they excavated down to the native material to shorten the driving penetration, excavating significant quantities of material.

Although the details of the 2010 construction season work have not been made available as of this date, we understand based on anecdotal information that the work did not go well, that there were significant problems in driving sheet piles even after excavating, that progress was very much less than scheduled, and that the contract was changed to a time and materials contract. The Marsh and French declarations both support the assertion that the design slope of the work platform dike was not workable. Page 6 of Marsh’s declaration states that design ***“…provided for the face sheets to be driven through the seaward slope of the fill dike and that proved unworkable. Howlett readily admitted the mistake. Thus the design intent in 2010 was for the dike fill on the North Extension to be pulled back so that***

the seaward slope would be well behind the sheets." MKB's claim is based on that fact that in spite of this situation, they were pressed to continue, and to accelerate to meet project schedule milestones.

G. **Construction Sequence** – The original bid documents did not specify installation sequence. We understand that MKB planned to drive tail wall extensions as a separate operation that could be performed at night and on-land, with less administrative restrictions relative to tidal fluctuations and marine mammals. MKB indicated that PND took no exception to this, expressing that the tail wall extension were there for seismic resistance and were not required for stability during construction. When the fill movement became apparent, the use of tail walls as anchors to hold previously installed sheets against movement was proposed. MKB responded and did this, but it impacted the efficiency of their installation operations.

H. **Tides and Phreatic Water** – General Note A.1 on Sheet 4 of the drawing set contains the statements, "Tides and phreatic water can cause fill instability during construction. The contractor's work plan must address these conditions." This statement is clearly an attempt to transfer risks for such occurrences to the contractor. However, it is not a sufficient defense for depicting a slope that is fundamentally not stable as a work platform. Although phreatic water affects the stability of the slope, the design also needed to take account of that and depict a stable dike configuration since driving from the land side was envisioned by the design and likely required to achieve schedule milestones.

I. **Iron Binding** – There is much discussion of iron binding that interfered with sheet pile installation in meeting minutes and correspondence. It should be pointed out that iron binding can occur solely due to improper sequencing and installation practices on the part of the contractor. That could be mitigated by revision of the installation sequence. In this case, it appears that iron binding was caused by movement of sheet piling that had been driven into hard BCF materials, activated by friction from fill movement that was accelerated and exacerbated by the action of vibratory pile driving. MKB did not design the slope of the work platform, and did not install the fill. MKB diligently tried to alter installation practices to mitigate the observed problems, at great expense. Ineffective and sometimes conflicting guidance was provided by ICRC and their engineers.

V. CONCLUSIONS

The following conclusions summarize the findings of the report:

- Movement in the in situ soils of the nature that would lead to a failure in the mode of global stability is not believed to have been a significant contributor to the observed sheet pile installation problems.
- The greatest contributor to the observed sheet pile installation problems was that the seaward slope of the work platform required by the bid documents was too steep to be stable during construction. The natural tendency of a 26^{o} to 33^{o} slope as contemplated by the bid documents and PND's interactions during May 2009 meetings would be to flatten to the expected stable slope angle of about 16^{o}, and this flattening would be accelerated by vibratory pile driving.
- Although Port Mackenzie is cited as a model for this project, the conditions are in fact somewhat different in that there was no thickness of fill at the dock face of Port Mackenzie to drive sheet piles through. The scale of the Port of Anchorage project is also dramatically greater, as can be seen from the overlays provided in Figures 4 and 5 of the report. It must be considered as a significant step-out in magnitude for application of the OSCP design concept, considering the hard foundation soils and substantial fill thicknesses through which sheet piles were designed to be driven.

- The estimated stable slope angle of 16^{o} (1 on 3.5 slope) is generally consistent with observed information from the natural angle assumed by the fill over a winter season (1 on 3 to 1 on 4), and by the 1 on 4 slope of the Corps of Engineers directive to West during the 2010 construction season.
- The design clearly anticipated land side pile driving from a work platform or "Initial Fill Dike" as it is called on the construction drawings. This was apparently based on the anticipation that the seaward slope shown in the bid documents (1 on 1.54 or 33^{o}) would be stable during construction.
- Dredging was required to remove soft soils from the dike footprint, and to reduce the lengths of required sheet pile driving into the hard foundation soils. There was an important section (Cells 1-8 of the North Extension) that was not dredged, but should have been, based on the undisclosed subsurface rock that was removed by West during the 2010 construction season.
- The sheet pile lengths and penetrations required by the design for this project are very high based on industry standards. This is of particular concern with the hard foundation materials and the great thicknesses of granular fill to also be penetrated by sheet pile driving. This coupled with fill movement, set the project up for problems with iron binding.
- Boulder obstructions were expected to affect sheet pile driving, but based on the subsurface information in the bid documents, this should not have been a major problem. Very hard driving was encountered in the precise areas where rock (apparently man-placed slope protection rock) undisclosed by the bid documents was subsequently found and removed. This is a changed condition that clearly affected MKB's work.
- The slope instability was attributed to loose soil. Actually, the stable slope angle for compacted fill is not much different, and thus ICRC and PND's suggestion to advance implementation of vibracompaction to facilitate sheet pile installation could not have been ineffective.
- Jetting was proposed by ICRC and PND in December 2008 as a solution to installing sheet piles into the hard foundation soils when actually, the foundation soils at the site are poorly suited to jetting. This was attempted, but was ineffective, as was expected by Dennis Nottingham of PND as stated in May 2009 meetings.
- The direction given by ICRC and PND in response to MKB's difficulties and requests for direction consisted of proposed remedial measures that were largely ineffective in facilitating installation. This was primarily because they did not address the actual problem, which was the inherent instability of the seaward slope of the work platform dike under construction conditions.
- The revised bid documents of April 2010 for the North Extension Bulkhead Project described a completely different project than was originally bid, with much more of the risk for the same inherent problem transferred to the contractor.
- Iron binding due to sheet movement from frictional forces applied to the steel sheet piles by fill movement certainly occurred. This is not the form of iron binding that contractors can inflict on themselves through improper driving sequence and related poor practices. In this case, the fill was moving, the foundation soils were hard and not moving, vibratory pile driving was required, and the penetrations through fill and foundation soils were large. MKB did not cause these contributing factors, and in fact tried many combinations of alterations to their planned sequence in attempting to deliver the project they had bid.

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FIGURES

REVISION			
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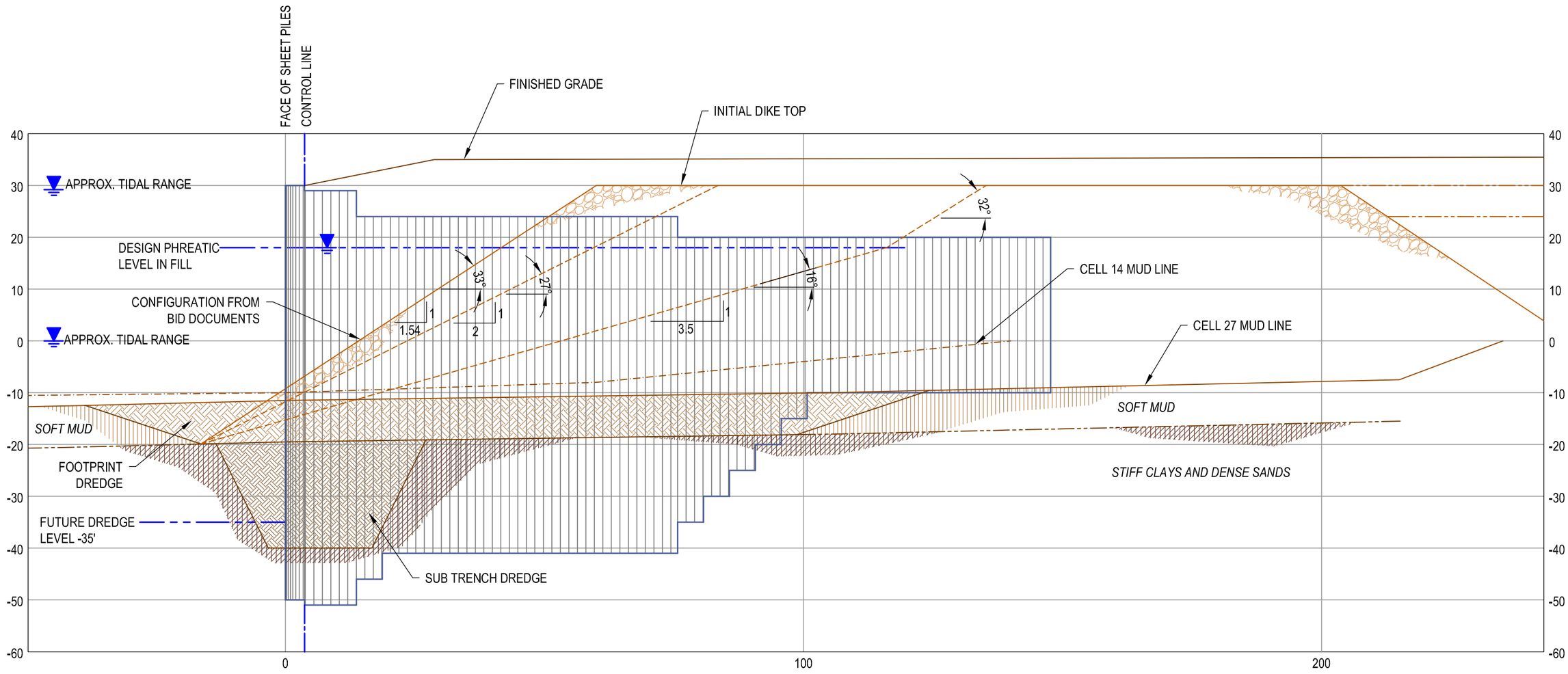

TYPICAL SECTION F-F (SHOWN AT CELL 29± TAKEN
FROM DRAWING SHEET 14, NORTH EXTENSION)

SUBJECT TO ER 408

Lachel & Associates
A SCHNABEL ENGINEERING COMPANY
240 Cedar Knolls Rd, Ste 101
Cedar Knolls, NJ 07927-1621
973-734-0200

Jan 10, 2011
Issue date

Design: DC	Dwg: KJC
Ch'k:	Review:

PORT OF ANCHORAGE

CROSS-SECTION F-F

Project No: 10366008.00	Figure 1	0

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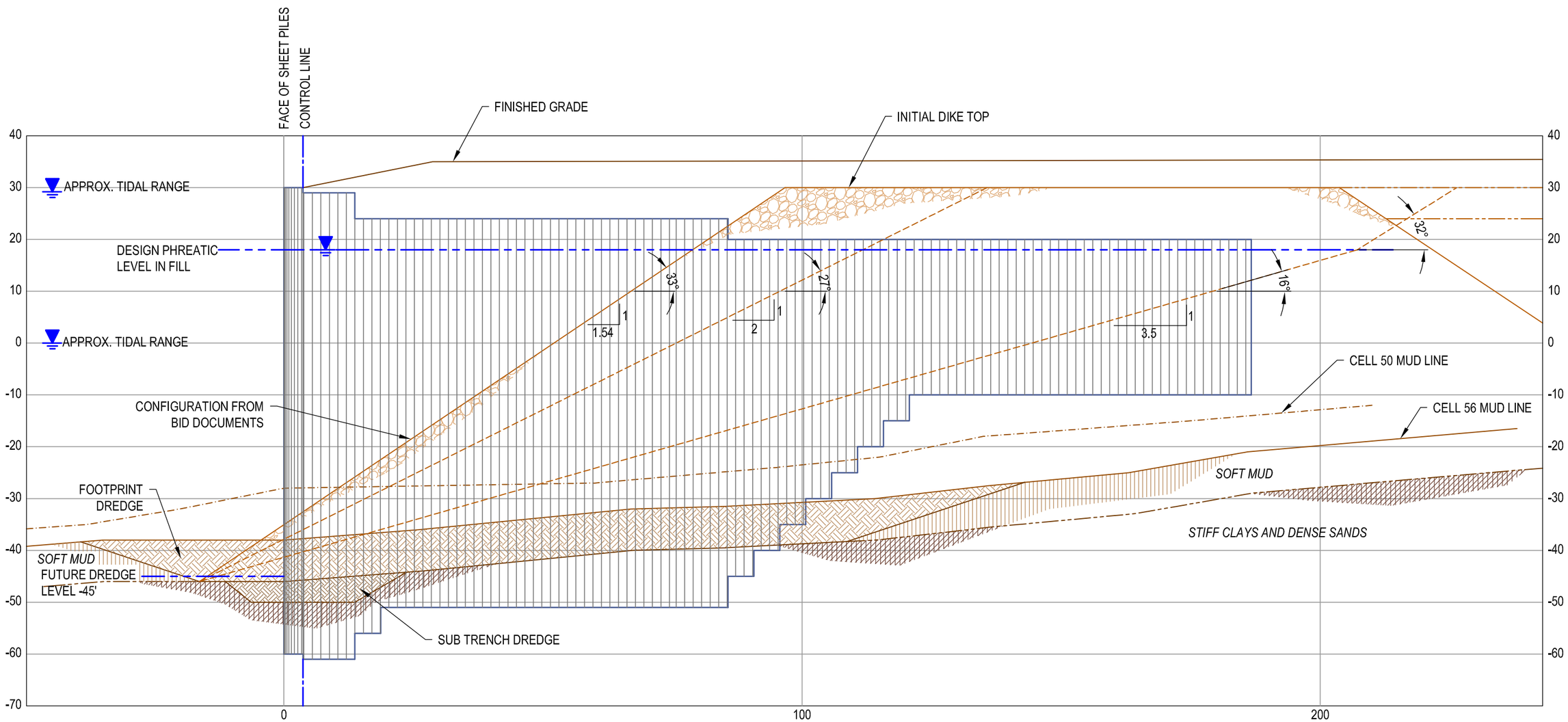

TYPICAL SECTION G-G (SHOWN AT CELL 56± TAKEN FROM DRAWING SHEET 14, NORTH EXTENSION)

SUBJECT TO ER 408

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Jan 10, 2011
Issue date

Design: DC	Dwg: KJC
Ch'k:	Review:

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CROSS-SECTION G-G

Project No: 10366008.00	Figure 2	0

REVISION			
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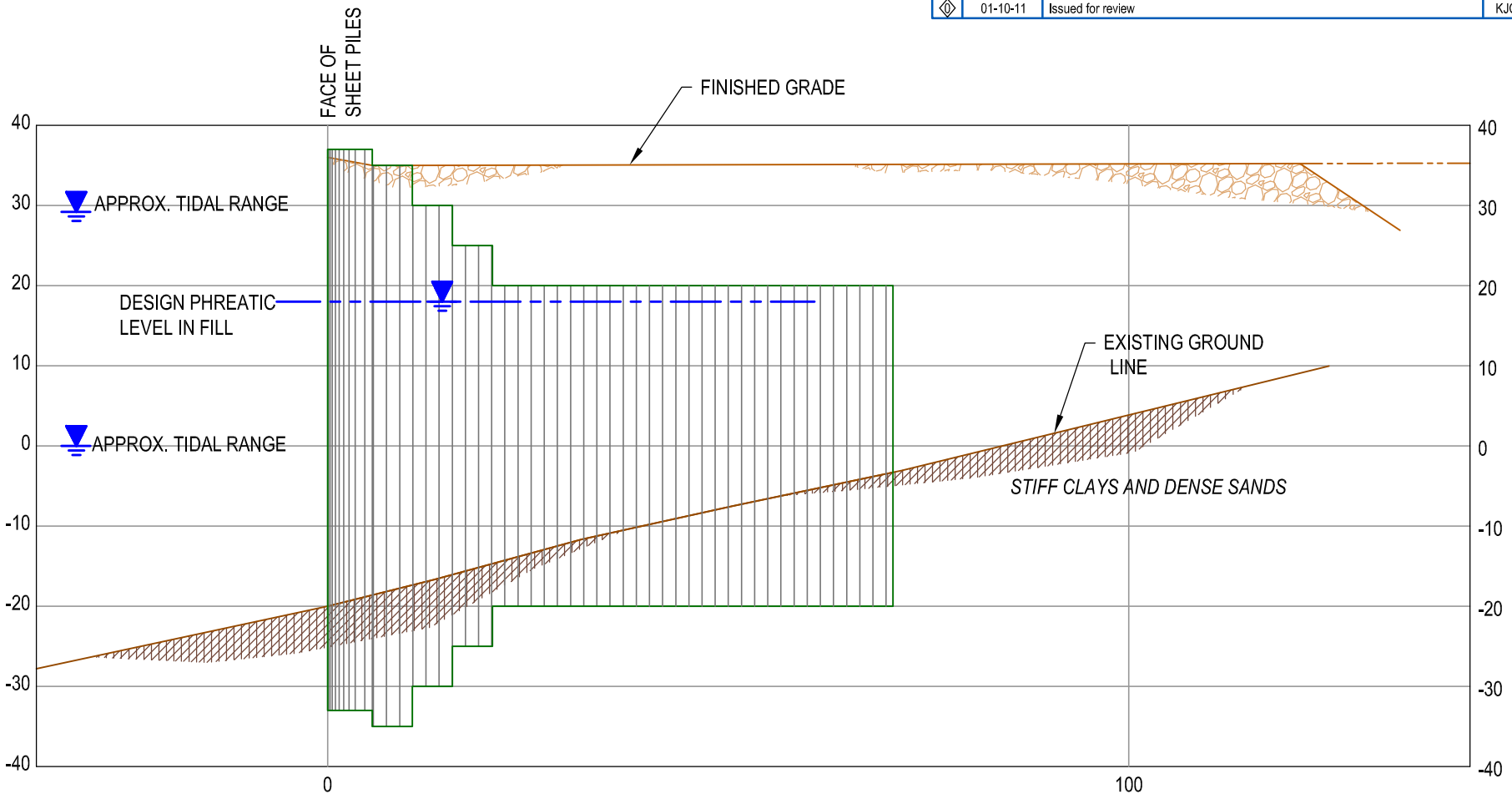
0	01-10-11	Issued for review	KJC



TYPICAL SECTION PORT MACKENZIE (FROM PND DESIGN DRAWINGS)

SUBJECT TO ER 408

Lachel & Associates
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240 Cedar Knolls Rd. Ste 101
Cedar Knolls, NJ 07927-1621
973-734-0200
Jan 10, 2011

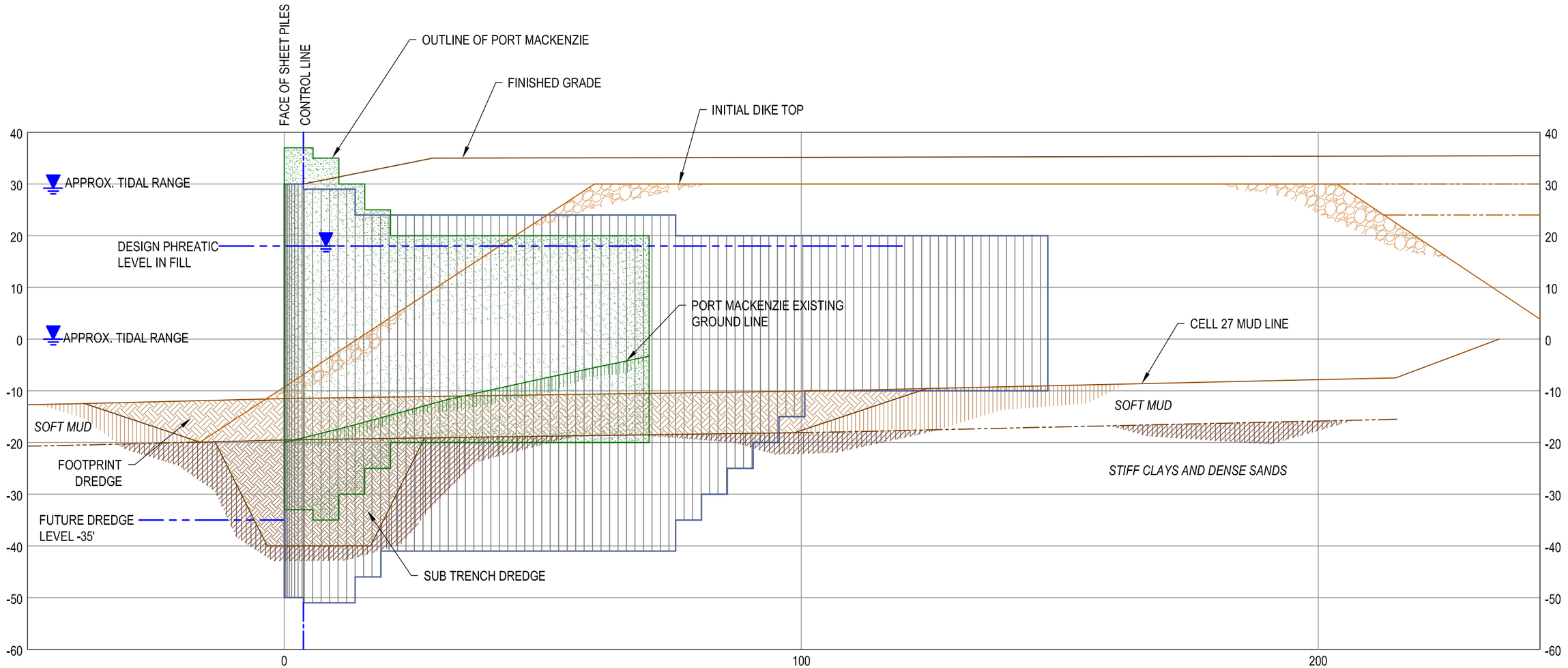
Design: DC	Dwg: KJC
Ch'k:	Review:

PORT OF ANCHORAGE

CROSS-SECTION PORT MACKENZIE

Project No: 10366008.00	Figure 3	0

REVISION			
No.	Date	Description	By
1	01-10-11	Issued for review	KJC



SECTION F-F (SHOWN AT CELL 29±) WITH
OVERLAY OF PORT MACKENZIE

SUBJECT TO ER 408

Lachel & Associates
A SCHNABEL ENGINEERING COMPANY
240 Cedar Knolls Rd, Ste 101
Cedar Knolls, NJ 07927-1621
973-734-0200

Jan 10, 2011
Issue date

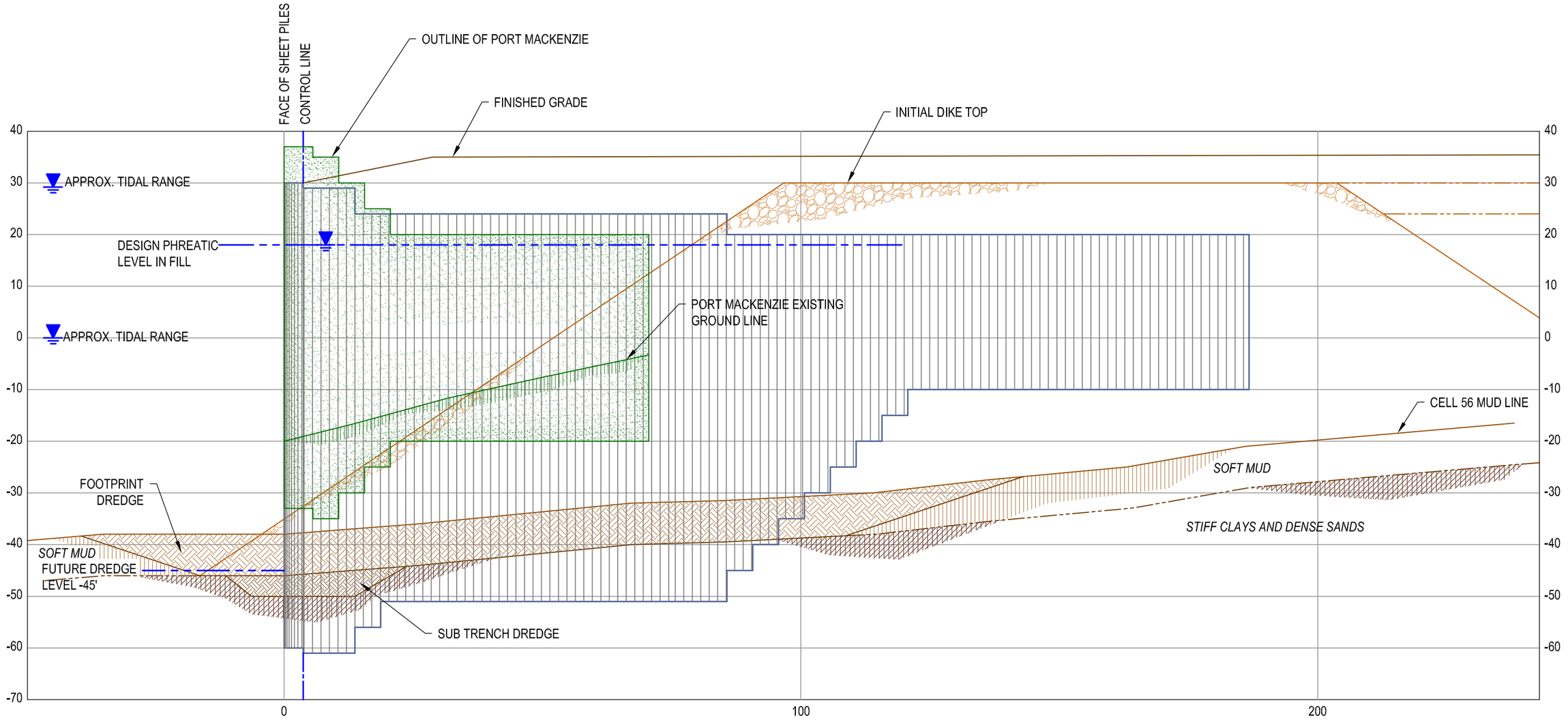
Design: DC	Dwg: KJC
Ch'k:	Review:

PORT OF ANCHORAGE

CROSS-SECTION F-F WITH OVERLAY

Project No: 10366008.00	Figure 4	0

REVISION			
No.	Date	Description	By
0	01-10-11	Issued for review	KJC



SECTION G-G (SHOWN AT CELL 56±) WITH
OVERLAY OF PORT MACKENZIE

SUBJECT TO ER 408

Lachel & Associates
A SCHNABEL ENGINEERING COMPANY
240 Cedar Knolls Rd, Ste 101
Cedar Knolls, NJ 07927-1621
973-734-0200

Jan 10, 2011
Issue date

Design: DC	Dwg: KJC
Ch'k:	Review:

PORT OF ANCHORAGE

CROSS-SECTION G-G WITH OVERLAY

Project No: 10366008.00	Figure 5	0

Item H18:

Summary Report by ICRC Citing 34% Damaged Piles

SUMMARIZED INVENTORY OF SHEET PILE REMOVAL BY CATEGORY

Current as of: 10/4/2011 By: Rob Del Rosario, ICRC

SHEET PILE PULLED PER YEAR

2010			2011		
Categories	**Pulled sheet pile**	**%**	**Categories**	**Pulled sheet pile**	**%**
(**DO**)= DAMAGE OBSERVED	562	36%	(**DO**)= DAMAGE OBSERVED	65	22%
(**NMDO**)= NO MAJOR DAMAGE OBSERVED	100	6%	(**NMDO**)= NO MAJOR DAMAGE OBSERVED	0	0%
(**NOD**)= NO OBSERVED DAMAGE	897	58%	(**NOD**)= NO OBSERVED DAMAGE	231	78%
TOTAL PULLED:	1559	100%	**TOTAL PULLED:**	296	100%

TOTAL OF SHEET PILE PULLED FOR 2010 AND 2011

Categories	Pulled sheet pile	%
(**DO**)= DAMAGE OBSERVED	627	34%
(**NMDO**)= NO MAJOR DAMAGE OBSERVED	103	6%
(**NOD**)= NO OBSERVED DAMAGE	1128	60%
TOTAL PULLED:	1858	100%

NOTES
The no-damage/damage categories in this report reflect the visual obervation conducted by ICRC's Quality Assurance personnel.