WARD LAKE DAM OUTLET REHABILITATION Construction File No. C-0888A Dam ID No. 400533

Final Construction Report December 22, 2020

This report has been prepared for the Ward Lake Dam Outlet Rehabilitation in Delta County, Colorado per Section 8.3.1.4 of the Rules and Regulations for Dam Safety and Dam Construction, effective date January 1, 2020.

Project Description

The Ward Lake Outlet Replacement project was jointly funded by Colorado Water Conservancy Board (CWCB) and Surface Creek Ditch and Reservoir Company (SCDRC). The project was necessitated by a zero-fill decree from the State Engineer's Office (SEO) in 2017 due to continuing seepage issues from repairs made in 1958 to the outlet (Construction file C-888). The dam was breached in June 2018 and design completed by DOWL and approved by the SEO in April 2020.

8.31.1 Notification of Completion

As required by Rule 8.3.1.1, this report serves as notification that the project is complete and ready for acceptance by the State Engineer upon review and approval of the Asconstructed drawings and this completion certification report.

10.2.3 Construction Report

A. Summary of significant construction milestones

- June 11, 2020 Bids were received and opened from eight regional contractors. Con-Sy, Inc. from Grand Junction was the apparent low bidder and was awarded a contract for construction for \$332,952.00 by consensus of the SCDRC board on June 17, 202. Notice of award was sent to Con-Sy on June 19, 2020.
- July 1, 2020 A preconstruction conference with SEO engineers, Con-Sy staff, the SCDRC board and DOWL staff was held in the Grand Mesa Water Users Association office in Cedaredge. (See Appendix A for the meeting agenda provided by the SEO)
- July 13, 2020 A field kickoff meeting was held on site with representatives of the SEO, DOWL, Con-Sy and SCDRC. An initial project schedule was distributed by Con-Sy staff.
- July 22, 2020 Site meeting with Jason Ward (SEO), Keith Waibel (SCDRC), Dustin Roehm (Con-Sy) and Dan Quigley (DOWL) to discuss dewatering, excavation progress and surface preparation of the breach benches prior to embankment. (See SEO report in Appendix A for more details)

- August 5, 2020 Site meeting of Jackie Blumberg (SEO) and Dan Quigley (DOWL) to examine the existing outlet pipe after exposure by Con-Sy staff and prior to subgrade preparation. (See SEO report in Appendix A for more details)
- August 11, 2020 Due to reports of standing water in the outlet foundation excavation by Con-Sy staff, Jason Ward (SEO) and Dan Quigley (DOWL) met with Con-Sy staff on site to discuss dewatering options. Based on our observations, Con-SY installed three temporary dewatering wells and pumped water out of the excavation and into the 12-inch HDPE bypass pipe that was part of the dewatering plan for the outlet construction to prevent flooding of the excavation. (See SEO report in Appendix A for more details)
- August 14, 2020 SEO, DOWL and Con-Sy met on site to observe proof-rolling of the outlet foundation and approve the foundation to start the replacement outlet pipe construction. Foundation was approved. (See SEO report in Appendix A for more details)
- August 19, 2020 Sand diaphragm installation demonstration observation with Jackie Blumberg (SEO) and Dan Quigley (DOWL) as required by SEO construction inspection schedule. Test was repeated to determine an acceptable methodology for the contractor to use in constructing the sand diaphragm. (See SEO report in Appendix A for more details)
- August 26, 2020 Formwork and reinforcing steel inspection of the outlet pipe encasement with Jackie Blumberg and Jason Ward (SEO) and Dan Quigley (DOWL) as required by the SEO construction inspection schedule. Formwork was approved and concrete encasement for the pipe was placed on August 28, 20-20.
- September 16, 2020 Formwork and reinforcing steel inspection of inlet structure with Jackie Blumberg (SEO). Formwork was approved and concrete for the inlet structure was placed on September 18th.
- September 28, 2020 An embankment methodology observation meeting was held on site with Jason Ward (SEO) and Dan Quigley (DOWL) in attendance. Con-Sy moistened the previously excavated 1-foot "benches" on the sides of the excavation to "stitch" in new soil using a D-5 dozer. That material was then compacted using a single drum sheepsfoot compactor to achieve required density of the embankment fill. Methodology was accepted as being adequate to comply with approved plans and specifications.
- November 5, 2020 Jason Ward (SEO) conducted an inspection of the project to develop a punchlist for the contractor and because a winter storm was forecast for November 7-8 so that the site could be observed in generally dry conditions. Due to COVID-19 quarantine requirements, Dan Quigley (DOWL) could not attend the meeting.

- November 17, 2020 Final site inspection was held with Jackie Blumberg and Jason Ward (SEO), Dan Quigley (DOWL), Keith Waibel (SCDRC) and Con-Sy staff in attendance. Approximately 12-18 inches of snow covered the site. Outstanding items were the last two anchors for the gate stem and air vent pipes and seeding the downstream face of the embankment. Dan Quigley subsequently visited the site on November and confirmed that these items had been completed.
- November 23, 2020 Approval to temporarily fill the reservoir to a gage height of 11.0 feet was is issued as requested in DOWL's letter of November 17, 2020.

B. Problems Encountered and Their Solutions

Dewatering of Foundation

Upon completion of the excavation to plan depth of 10096.0 feet, Con-Sy reported standing water on the foundation. Inspection by both SEO and the Engineer resulted in the construction of three dewatering wells on the west side of the foundation excavation. Those dewatering wells consisted of a 1/2 H.P. pump in each 12-inch diameter PVC pipe well that pumped excess water to the existing 12-inch HDPE bypass pipeline on the west side of the excavation. Con-Sy pumped intermittently for 3 days to dewater the foundation in preparation of the foundation inspection and proof-roll test on August 14th as described above. No further groundwater issues were encountered during construction of the outlet works and dam embankment.

Initial Breach Excavation and Enlargement

The initial effort by Con-Sy to excavate the existing breach and enlarge it per plans and specifications was limited since only one employee using a track hoe was on site for the first 3 weeks of the project. The first scheduled foundation inspection on August 7, 2020 was unsuccessful because Con-Sy had not excavated to the foundation limits shown on the approved plans. This was quickly corrected and the second inspection for the foundation preparation on August 14, 2020 was conducted by Engineer Dan Quigley and SEO Division 4 dam safety engineer Jason Ward and the foundation approved to begin placement of the outlet pipe and embankment material.

Winter Conditions - Western Colorado experienced unusually dry weather conditions during the summer and fall of 2020, however snowfalls on September 8-9 and November 7-8 hampered Con-Sy's productivity and the ability to complete the dam construction sooner than expected. The remaining items that were impacted included rip-rap placement on the embankment, final installation of the gate stem and final grading and re-seeding of the dam crest. These items were completed on or before November 20,2020.

C. Summary of Construction Materials Testing.

Appendix D presents all of the Quality Control testing performed by Huddleston-Berry and Quality Assurance testing performed by DOWL for the project. Summaries of the contractor's Quality Control and the owner's Quality Assurance testing are presented in Tables 1 and 2 below.

Feature	Section	Test	Required # of Tests	Actual # of Tests
		Moisture Density (Nuclear Method)	42	68
Embankment	31 24 00 -C	Gradation/Atterberg/Classification	6	3
		Moisture-Density (1 point)	6	3
Sand Filter	31 24 00 -C	Gradation	1	1
Drain Gravel	31 24 00 -C	Gradation	1	1

Table 1 – Summary of Quality Control Testing

Table 2 - Summary of Quality Assurance Testing

Foaturo	Soction	Tost	Required	Actual #
reature	Section	1651	# of Tests	of Tests
		Moisture Density (Nuclear Method)	-	34
Embookmont	21 24 00 0	Gradation/Atterberg/Classification	-	4
EIIIDalikiileili	51 24 00 -0	Moisture-Density (1 point)	-	3
Sand Filter	31 24 00 -C	Gradation	-	1
Drain Gravel	31 24 00 -C	Gradation	-	1

8.3.1.2 - Schedule of First Fill

On November 23, 2020, a Temporary Approval to Fill Deep Ward Lake to a gage height of 11.0 feet was issued by the State Engineer's Office. That approval is presented in Appendix A of this report. SCDRC began filling on that date.

8.3.1.3 - As-Constructed Plans

As-constructed plans are included as a separate transmittal with this completion report.

8.3.1.5 - Permanent Monuments. There were no permanent monuments required or installed for this project.

8.3.1.6 - Long-Term Monitoring Plan

Surface Creek Ditch and Reservoir Company will be responsible for providing periodic monitoring of the dam and associated infrastructure. They will contact the SEO to determine an appropriate frequency of inspection and format for reporting their observations.

8.3.1.7 - Emergency Action Plan

SCDRC will update their Emergency Action Plan (EAP) as necessary for the new outlet works. Since the project replaced existing outlet pipe and components and the embankment height remained the same, no significant revisions to the existing EAP are anticipated.

The construction of the dam and related infrastructure is complete and is in general conformance to the construction plans and specifications approved by the State Engineer's Officve for the project.

DOWL

Daniel C. Quigley, PE Engineer





Appendix A - SEO Inspection Reports, Correspondences

- Appendix B Weekly Construction Summary Reports with Progress Photos
- Appendix C Materials Testing Results

Appendix D - DOWL Field Observation Reports

APPENDIX A

SEO INSPECTION REPORTS

AND

CORRESPONDENCES



CONSTRUCTION INSPECTION REPORT

PROJECT INFORMATION			
Dam Name:	WARD LAKE	Inspector:	Jason Ward
DAMID:	400533	Date:	July 22, 2020
C-#:	C-0888A	Time on Site:	1400 - 1500
Dam Owner:	Surface Creek Ditch & Reservoir Company (SCDRC)	Contact:	Keith Waibel, 907-201-6481
Engineer:	DOWL	Contact:	Dan Quigley 970-596-4923 (c) Russ Reed (406) 656-6399
Contractor:	Con-Sy, Inc.	Contact:	Wayne Balderston, 970-683-1604 Tanner Lee, 970-644-1678 Tom Lee, 970-379-5729 Dustin Roehm, 970-712-4890
Material QC	Huddleston-Berry	Contact:	
Approved Plans & Specifications On-site? 🗹 Yes 🗌 No Engineer Following Const. Obs. Plan? 🗹 Yes 🗌 No			

INSPECTION PARTICIPANTS

	Jason Ward (SEO)
Inspection	Dan Quigley (DOWL)
Participants:	Keith Waibel, SCDRC
·	Dustin Roehm (Con-Sy)

	CONDITIONS
Reservoir:	Empty; 0.8 cfs flow through existing outlet pipe
Weather:	Partly cloudy
Equipment:	Link 235x track excavator
	John Deere 350D articulated dump truck
	John Deer 225C track excavator

	CONSTRUCTION STATUS
Work Completed to Date:	 Potholing adjacent to existing outlet pipe (7/16/20) Expansion of existing breach per Sheet 8 Outlet Works Excavation Plan
Work in Progress:	Cut of left breach slope to construction staking.Blending of stockpile material.
Work Planned and	1-week look ahead:
cst. finiendine.	 Install dewatering per plan



	UBSERVATIONS AND DISCUSSION
Purpose of Inspection:	The purpose of the inspection was to observe work progress on the outlet works excavation plan.
Items Inspected:	 Left bank of breach excavation. The left bank of the breach has been excavated to construction staking per Sheet 8 Outlet Works Excavation Plan of the approved plans. The contractor has pre-formed benches into the side slope to meet the intent of the Drawings Sheet 11 (and others), and Specifications Section 31 24 00, Section 3.02.E. The bench geometry appears in general conformance with the plans and specifications. A pocket of blue clay was encountered in the lower portion of the breach left side slope. While different in color, the consistency appeared similar to the embankment fill lean clay CL material.
Items not in conformance with approved plans and specs:	None.
Problems/Concerns:	 There is concern that additional surface preparation, above and beyond Specifications Section 31 24 00 Section 3.02, made be needed prior to placing embankment fill, including, but no limited to: Removal of large particles encountered in the bench cuts that leave voids, i.e. 6-12 inch rock leaving a void in the cut (see photo). Degradation of the subgrade after weeks of exposure. Moisture conditioning of the exposed slope prior to backfill placement. Additional field evaluation should be conducted to determine if the blue clay encountered in the left breach sideslope is acceptable subgrade material.
Design Change Orders:	None.
Minor Changes:	None.
Conclusions:	Current work appears to be in conformance with the approved plans and specifications.
Action Items:	 Breach backfill: Prepare and submit a plan for preparation of pre-formed and exposed benches in breach cut, prior to placement of embankment fill above the elevation of the outlet works. Determine if blue clay is acceptable subgrade material. Water Diversion Plan:
Next Inspection	A Water Diversion Plan must be submitted in accordance with Rule 8.1.1.

ODOEDI ATIONO AND DIGOLIOOION

ec: Dan Quigley, DOWL, <u>dquigley@dowl.com</u> Loree Gutierrez, Surface Creek Ditch and Reservoir Company, <u>Gutierrez646@hotmail.com</u> Grand Mesa Water Users Association, <u>admin@gmwua.com</u> Wayne Balderston, Con-Sy, <u>wayne.consy@gmail.com</u> Tanner Lee, Con-Sy, <u>tannerllcsi@gmail.com</u> Tom Lee, Con-Sy, <u>csitomlee@aol.com</u> Rachel Pittinger, Colorado Water Conservation Board James Holiman, WD 40 Water Commissioner Scott Frost, WD 40 Water Commissioner Bill McCormick, Chief, Dam Safety Branch Jackie Blumberg, Dam Safety Engineer Expansion of existing breach per Excavation Plan.





View looking downstream along left sideslope of breach with pre-formed benches. Blue clay can be seen in foreground.



Close-up of benched sideslope.



Example of oversized particle in bench that should be removed prior to fill placement. Void needs treatment prior to backfill.



CONSTRUCTION INSPECTION REPORT

PROJECT INFORMATION			
Dam Name:	Ward Lake	Inspectors:	Jackie Blumberg
DAMID:	40033	Date:	5Aug2020
C-#:	C-0888A	Time on Site:	10:00 to 10:40am
Dam Owner:	Surface Creek Ditch & Reservoir Co.	Contact:	Keith Waibel (970-856-3165)
Engineer:	DOWL	Contact:	Dan Quigley (970-497-8852)
			Russ Reed (406-656-6399)
	Con-Sy	Contact:	Wayne Balderton (970-683-1604)
			Tanner Lee (970-644-1678)
Contractor:			Tom Lee (970-379-5729)
			Dustin Roehm (on-site foreman) (970-
			712-4890)
Approved Plans & Specifications On-site? 🗹 Yes 🗌 No		Engineer Followi	ng Const. Obs. Plan? 🗹 Yes 🗌 No

INSPECTION PARTICIPANTS

Inspection Participants:	Dan Quigley (DOWL) Dustin Roehm (Con-Sy) Jackie Blumberg (SEO)
Participants:	Dustin Roehm (Con-Sy Jackie Blumberg (SEO)

	CONDITIONS		
Reservoir:	Empty; <0.5-inch of flow through bypass pipe		
Weather:	Sunny and clear, mid 60s		
Equipment:	CAT 350D loader - active		
	Link Belt 235 excavator - active		
	350G excavator - inactive		
	225C excavator - inactive		

	CONSTRUCTION STATUS
Work Completed	Potholing adjacent to existing outlet pipe
to Date:	Breach excavation (sides)
Work in Progress:	Removal of old pipe
	Excavate to subgrade
Work Planned and	Foundation subgrade proof roll (8/7/2020)
est. Timeframe:	Pipe encasement (begin 8/3/2020)
	Outlet structure (begin 8/11/2020)

OBSERVATIONS AND DISCUSSION		
Purpose of	Forensic inspection of historic pipe (not an SEO defined construction milestone)	
Inspection:	Verify dewatering system installation, per Plan approved 7/31/2020	
Items Inspected:	Old pipe prior to removal	
	 Pothole directly adjacent to old pipe - preview of subgrade 	
	New pipe	
	Old and new breach material stockpiles	
	Dewatering system	
	Benching of breach side slopes	



OBSERVATIONS AND DISCUSSION			
Items not in compliance with approved plans/specs:	None		
Problems/Concerns:	Blue clay in the left breach side slope has been verbally resolved between DOWL and the SEO. Material may have been a discrete volume from off-site during original construction and appears to generally conform with suitable embankment criteria.		
Design Change Orders:	none		
Minor Changes:	none		
Conclusions:	Current work appears to be in conformance with approved plans and specifications		
Action Items:	 Action Item: Plan for preparation and pre-forming of exposed benches in breach cut, prior to placement of embankment materials will be resolved by field directive provided by DOWL to Con-Sy. 		
Next Inspection:	Foundation subgrade proof roll on 8/7/2020.		



Photo 1. Exposed area beneath old pipe - note woody debris from forms left in place during concrete collar construction



Photo 2. Old pipe joint





Photo 3. Pipe is desribed as ¼-inch thick, asbestos wrapped welded steel pipe with arc weld joints (reference C-0590 specfications) - photo shows outer material scraped away, revealing steel beneath



Photo 5. Interior view of old pipe - surprisingly good condition



Photo 4. Close-up view of old pipe exterior - seam along side of pipe appeared discontinuous - the section of pipe upstream likely was turned over, with the seam located beneath



Photo 6. Formwork left in place from original construction

PHOTOGRAPHS



Photo 7. Stilling basin - terminal end of pipe (area to be dewatered)



Photo 9. Flow depth of less than 0.5-inch conveyed by bypass pipe



Photo 8. View of the old, exposed pipe, prior to removal



Photo 10. Bypass pipe inlet - old trash rack is visible in center right of photo

PHOTOGRAPHS



Photo 11. Access over bypass - photo is taken upstream from Photo 10



Photo 12. Newly excavated stockpiled material - Con-Sy plans to transport a shaker/screener to the site to facilitate removal of large D-50 elements





ec: Dan Quigley, DOWL, <u>dquigley@dowl.com</u> Russell Reed, DOWL, <u>rreed@dowl.com</u> Loree Gutierrez, Surface Creek Ditch and Reservoir Company, <u>Gutierrez646@hotmail.com</u> Grand Mesa Water Users Association, <u>admin@gmwua.com</u> Wayne Balderston, Con-Sy, <u>wayne.consy@gmail.com</u> Tanner Lee, Con-Sy, <u>tannerllcsi@gmail.com</u> Tom Lee, Con-Sy, <u>csitomlee@aol.com</u> Rachel Pittinger, Colorado Water Conservation Board James Holiman, WD 40 Water Commissioner Scott Frost, WD 40 Water Commissioner Bill McCormick, Chief, Dam Safety Branch Jason Ward, Dam Safety Engineer



CONSTRUCTION INSPECTION REPORT

PROJECT INFORMATION			
Dam Name:	WARD LAKE	Inspector:	Jason Ward
DAMID:	400533	Date:	August 11, 2020
C-#:	C-0888A	Time on Site:	0900-1000
Dam Owner:	Surface Creek Ditch & Reservoir Company (SCDRC)	Contact:	Keith Waibel, 907-201-6481
Engineer:	DOWL	Contact:	Dan Quigley 970-596-4923 (c)
Contractor:	Con-Sy, Inc.	Contact:	Russ Reed (406) 656-6399 Wayne Balderston, 970-683-1604 Tanner Lee, 970-644-1678 Tom Lee, 970-379-5729 Dustin Roehm, 970-712-4890
Material QC	Huddleston-Berry	Contact:	
Approved Plans & Specifications On-site? 🗹 Yes 🗌 No		Engineer Followi	ng Const. Obs. Plan? 🗹 Yes 🔲 No

INSPECTION PARTICIPANTS

Inspection Participants: Jason Ward (SEO) Dan Quigley (DOWL) Wayne Balderston (Con-Sy)

CONDITIONS			
Reservoir:	Empty		
Weather:	Partly cloudy, warm		
Equipment:	Link 235x track excavator		
John Deere 350D articulated dump truck			
John Deer 225C track excavator			

CONSTRUCTION STATUS				
Work Completed	Breach of embankment to outlet works foundation elevation.			
to Date:				
Work in Progress:	Dewatering			
	Embankment fill processing and blending.			
Work Planned and	Foundation proof rolling dependent on dewatering			
est. Timeframe:				

	OBSERVATIONS AND DISCUSSION
Purpose of Inspection:	The purpose of the inspection was to observe uncontrolled water in the excavated outlet works foundation and to discuss alternatives with the engineer and contractor.



Items Inspected:	 <u>"Floor of Outlet Works" Excavation (per Sheet 8, Profile View)</u> The outlet works foundation was reportedly excavated to elevation 10,096.0 as shown on the Excavation Plan, Sheet 8 Saturated soils and areas of standing water 2-4 inches deep were observed along the entire length of the outlet works foundation. The base of cut slopes on either side of the excavation were saturated with a few areas showing evidence of recent seepage flow. No flow was observed in the foundation or along the base of the cut slopes. Mild sloughing had occurred on both adjacent cut slopes. Most areas probed to a firm foundation within 1-6 inches. Access with a loader and trackhoe were reported with no problems. 	
Items not in conformance with approved plans and specs:	Dewatering of the outlet works foundation in accordance with Specification Section 31 24 00, 3.02.1 Preparation.	
Problems/Concerns:	 There is concern that a water source (reservoir, spring, etc) is continually recharging the foundation excavation such that suitable moisture conditions for proof rolling cannot be achieved. The contractor indicated that pumping of accumulated water was successful, but only for a short period of time; less than 24 hours. Flow and amount of water did not seem to be increasing, but no permanent drainage or pumping solution has been implemented. 	
Design Change Orders:	None.	
Minor Changes:	None.	
Conclusions:	Dewatering of the foundation to achieve suitable conditions will not be achieved without intervention.	
Action Items:	 Several potential dewatering solutions were discussed with the engineer and contractor including, but not limited to: Installing well points along the edge of the foundation (both sides?) in order to promote drawdown of the water source(s) and prevent pooling at the excavation level. Ideas for well points included: Three well points proposed by constractor; 8-12 inch diameter slotted pvc pipe buried vertically 2-4 feet at strategic locations; Possible gravel or free-draining material placed in and around the wells; Sump pumps installed into each well; Pumping into the existing dewatering pipe (not preferred) or installing a new dedicated drain line for the well points (preferred). A trench excavation for gravity draining was discussed, but is not preferred at this time. Moving the reservoir bypass to a more upstream location further away from the excavation to reduce any influence it may have. The engineer and contractor were advised that any dewatering solution that modifies the outlet works foundation (i.e. wells, trenches, etc) will be required to be properly abandoned by a method acceptable to the Engineer and Dam Safety prior to backfilling. 	
Next Inspection:	Outlet works foundation proof rolling	

ec: Dan Quigley, DOWL, <u>dquigley@dowl.com</u> Loree Gutierrez, Surface Creek Ditch and Reservoir Company, <u>Gutierrez646@hotmail.com</u> Grand Mesa Water Users Association, <u>admin@gmwua.com</u> Wayne Balderston, Con-Sy, <u>wayne.consy@gmail.com</u> Tanner Lee, Con-Sy, <u>tannerllcsi@gmail.com</u> Tom Lee, Con-Sy, <u>csitomlee@aol.com</u> Rachel Pittinger, Colorado Water Conservation Board James Holiman, WD 40 Water Commissioner Scott Frost, WD 40 Water Commissioner Bill McCormick, Chief, Dam Safety Branch Jackie Blumberg, Dam Safety Engineer



Overall view of outlet works foundation looking in downstream direction.



View looking downstream along outlet works foundation.

Close-up of typical area of standing water; location is near Sta 1+20 for the outlet sand diaphragm.





Upstream end of outlet works foundation; estimated Sta. 0+40.



CONSTRUCTION INSPECTION REPORT

PROJECT INFORMATION			
Dam Name:	Ward Lake	Inspectors:	Jackie Blumberg
DAMID:	40033	Date:	14Aug2020
C-#:	C-0888A	Time on Site:	11:00 - 13:30
Dam Owner:	Surface Creek Ditch & Reservoir Co.	Contact:	Keith Waibel (970-856-3165)
Engineer:	DOWL	Contact:	Dan Quigley (970-497-8852)
			Russ Reed (406-656-6399)
Contractor:	Con-Sy	Contact:	Wayne Balderton (970-683-1604)
			Tanner Lee (970-644-1678)
			Tom Lee (970-379-5729)
			Dustin Roehm (on-site foreman) (970-
			712-4890)
Approved Plans & Specifications On-site? 🗹 Yes 🗌 No		Engineer Following Const. Obs. Plan? 🗹 Yes 🗌 No	

INSPECTION PARTICIPANTS

Inspection Participants: Dan Quigley (DOWL) Tom Lee, Wayne Balderton, Dustin Roehm (Con-Sy) Jackie Blumberg (SEO)

CONDITIONS			
Reservoir:	Empty		
Weather:	Sunny and clear, mid 70s		
Equipment:	quipment: Kenworth Dump truck (rubber tires, used for proof rolling) CAT 350D loader - active Link Belt 235 excavator - active Sheepsfoot roller - active		

CONSTRUCTION STATUS			
Work Completed	Potholing adjacent to existing outlet pipe		
to Date:	Breach excavation (sides)		
	Removal of old pipe		
	Excavate to subgrade		
Work in Progress:	Compacting subgrade to non-yielding surface		
	Filtering embankment material stockpile		
Work Planned and	Estimated timeframes pending look-ahead schedule update:		
est. Timeframe:			
	Backfill and compact beneath pipe (early next week)		
	Test section for filter material (end of next week)		
	New pipe installation		
Formwork, reinforcement and encasement			

OBSERVATIONS AND DISCUSSION					
Purpose of	Observe dewatered subgrade and proof roll				
Inspection:					
Items Inspected:	Subgrade				
	Three dewatering wells were in place and subgrade appeared generally dewatered. Con-Sy reports				
	that elevation was approximately 10,095.5 (0.5-feet lower than shown on Sheet 805 Proof rolling				
	was achieved commensurate with specification 31 24 00.3.02 (Preparation) using a loader				



	OBSERVATIONS AND DISCUSSION
	Kenworth dump truck with rubber tires making four passes. The proof roll revealed two soft spots about 15-feet long, aligned with the center and downstream wells. Both spots were marked with paint and DOWL directed Con-Sy to excavate an additional 2-feet, backfill with filtered embankment materials and compact. Backfilling occurred by three lifts, each compacted using a sheepsfoot roller making 5 passes. A second proof roll of the subgrade yielded acceptable results.
	The location of the intake structure was not included within the proof roll as it will undergo additional excavation and treatment and is also the grade break/base of access road into outlet trench. Equipment entering the outlet trench has torn the ground up a bit locally.
	Con-Sy expects Huddleston-Berry to visit the site later in the day to test moisture content of filtered embankment material before backfilling and compaction.
Items not in compliance with approved plans/specs:	None
Problems/Concerns/ Discussion:	The SEO recommended the dewatering wells remain in place over the weekend. DOWL, SEO and Con-Sy to discuss proper abandonment of the dewatering wells next week.
Design Change Orders:	none
Minor Changes:	none
Conclusions:	Current work appears to be in conformance with approved plans and specifications. Con-Sy to begin placing and compacting lifts pending moisture testing of stockpile from Huddleston-Berry.
Action Items:	 (resolved) Action Item: Plan for preparation and pre-forming of exposed benches in breach cut, prior to placement of embankment materials will be resolved by field directive provided by DOWL to Con-Sy.
Next Inspection:	Observe method spec for filter materials, likely end of next week (August 20 th or 21 st)



Photo 1. First proof roll, end of second pass.

Photo 2. End of third pass. Soft spots were idetified in the vicinity of the center and downstream wells.

DSE





Photo 4. Two spots identified as yielding during proof roll were overexcavated by two additional feet, then backfilled with embankment materials and compacted. We Bell



Photo 6. The excavator spreads embankment material into the 2-foot overexcavated areas.

DSE



Photo 7. Backfilling: three lifts of embankment materials, each compacted by five passes with a sheepsfoot roller.



Photo 9. Kenworth loaded dump truck exits the outlet trench (looking upstream), following second proof roll.



Photo 8. Second proof roll. Looking downstream.



Photo 10. Foreground is the location of dump truck in previous photo, the approximate location of the intake structure (additional excavation needed) and the grade break/base of the equipment access into the outlet trench.

ec: Dan Quigley, DOWL, <u>dquigley@dowl.com</u> Russell Reed, DOWL, <u>rreed@dowl.com</u> Loree Gutierrez, Surface Creek Ditch and Reservoir Company, <u>Gutierrez646@hotmail.com</u> Grand Mesa Water Users Association, <u>admin@gmwua.com</u> Wayne Balderston, Con-Sy, <u>wayne.consy@gmail.com</u> Tanner Lee, Con-Sy, <u>tannerllcsi@gmail.com</u> Tom Lee, Con-Sy, <u>csitomlee@aol.com</u> Rachel Pittinger, Colorado Water Conservation Board James Holiman, WD 40 Water Commissioner Scott Frost, WD 40 Water Commissioner Bill McCormick, Chief, Dam Safety Branch Jason Ward, Dam Safety Engineer



CONSTRUCTION INSPECTION REPORT

PROJECT INFORMATION			
Dam Name:	Ward Lake	Inspectors:	Jackie Blumberg
DAMID:	40033	Date:	19Aug2020
C-#:	C-0888A	Time on Site:	14:00 - 15:30
Dam Owner:	Surface Creek Ditch & Reservoir Co.	Contact:	Keith Waibel (970-856-3165)
Engineer:	DOWL	Contact:	Dan Quigley (970-497-8852)
			Russ Reed (406-656-6399)
Contractor:	Con-Sy	Contact:	Wayne Balderton (970-683-1604)
			Tanner Lee (970-644-1678)
			Tom Lee (970-379-5729)
			Dustin Roehm (on-site foreman) (970-
			712-4890)
Approved Plans & Specifications On-site? 🗹 Yes 🗌 No		Engineer Following Const. Obs. Plan? 🗹 Yes 🗌 No	

INSPECTION PARTICIPANTS

InspectionDan Quigley (DOWL)InspectionWayne Balderton and crew (Con-Sy)Participants:Keith Waibel (SCDR)Jackie Blumberg (SEO)

CONDITIONS			
Reservoir:	Empty		
Weather:	Hazy, smoky, mid 70s		
Equipment:	Kenworth Dump truck (to be used to store filter material, to minimize contamination) CAT 85C mini-excavator Wacker Packer VP 1550 vibratory compactor		

CONSTRUCTION STATUS			
Work Completed	Potholing adjacent to existing outlet pipe		
to Date:	Breach excavation (sides)		
	Removal of old pipe		
	Excavate to subgrade		
	Dewatering and compacting subgrade to non-yielding surface		
	Fill placement to bring subgrade surface up to grade		
Work in Progress:	Filtering embankment material stockpile (ongoing)		
Work Planned and	New pipe installation (8/19/2020)		
est. Timeframe:	Formwork, reinforcement and encasement (8/19/2020 - 8/28/2020)		
	Form and pour inlet & outlet (8/28/2020 - 9/9/2020)		

OBSERVATIONS AND DISCUSSION			
Purpose of	Filter material test section (per specification 31 24 00.3.02.C.10)		
Inspection:			
Items Inspected:	Filter material test section		
	Specification 31 24 00.3.02.C.8 and 9 states that each thoroughly wetted 8-inch lift of material shall be compacted by two passes with a vibratory compactor for a target compaction of between		



OBSERVATIONS AND DISCUSSION						
	65 and 75 percent relative density. Material shall also not be over-compacted, as evidenced by increased fines following compaction.					
	The sides of the trench appeared clean, vertical and competent. One-foot marks were painted on the sides of the trench. The elevation of the trench floor was 10,094, consistent with the approved plans.					
	The filter material appeared visually acceptable; did not leave a fines residual on the hand. DOWL reported that the material was tested and the distribution was within spec.					
	Material was scooped from the dump truck by excavator and placed into the trench in one motion, extending the bucket away from the cab while tilting it to empty. The material was spread within the trench by hand tools to a uniform elevation. The material was then moisture conditioned using a garden hose and potable water from the water truck. DOWL collected nuclear gauge measurements for the first loose lift, then for each pass (one forward, one back) with the vibratory compactor. Based on measurements below, the two-pass specification appeared acceptable to DOWL and the SEO - suitable compaction was achieved in two passes. DOWL concluded the test section by collecting a grab sample to test for particle degradation (increase in fines).					
			dry dens	wet dens	% moist	
		loose	93.1	103.5	11.2	•
		1st pass	100.1	109.5	9.4	-
		2nd pass	101.8	109.9	7 9	
		3rd pass	102.1	110.1	7.8	
	The vibratory compactor was wider than the trench; turning it around for the return half of ear pass was accomplished by affixing a strap and raising from the trench.					
Items not in	None					
compliance with approved plans/specs:						
Problems/Concerns/ Discussion:	At the conclusion of the test section, Con-Sy, DOWL and the SEO discussed Good Housekeeping: keeping dirt clods from entering the trench (the mini-ex was positioned on the bench above the left side of the trench) and keeping the wheels of the vibratory compactor from encountering the walls of the trench during the process of turning around with excavator assist.					
Design Change	none					
Orders:						
Conclusions:	None					
Action Items:	1. (resolved, retained	for tracking	purposes	Action Ite	m: Plan for	r preparation and pre-
	forming of exposed benches in breach cut, prior to placement of embankment materials will be resolved by field directive provided by DOWL to Con-Sy.2. DOWL, SEO and Con-Sy to discuss proper abandonment of the dewatering well and					
Next Inspection:	Installed pipe, formwork and reinforcement prior to pouring concrete structures (8/19/2020 -					
the map cerom	8/28/2020). DOWL to coordinate with the SEO.					





Photo 4. Moisture conditioning the filter material. Con-Sy may opt to apply water while material is in the truck.

PHOTOGRAPHS



Photo 5. Nuclear guage testing.



Photo 6. The Wacker Packer. Following one half of the pass, a strap was affixed to the compactor, which was raised by the excavator and turned around to complete the second half of the pass. The Wacker Packer was slightly wider than the trench.



Photo 7. Grab sample collection following completion of test section, to evaluate for over-compaction and increased fines.

ec: Dan Quigley, DOWL, <u>dquigley@dowl.com</u> Russell Reed, DOWL, <u>rreed@dowl.com</u> Loree Gutierrez, Surface Creek Ditch and Reservoir Company, <u>Gutierrez646@hotmail.com</u> Grand Mesa Water Users Association, <u>admin@gmwua.com</u> Wayne Balderston, Con-Sy, <u>wayne.consy@gmail.com</u> Tanner Lee, Con-Sy, <u>tannerllcsi@gmail.com</u> Tom Lee, Con-Sy, <u>csitomlee@aol.com</u> Rachel Pittinger, Colorado Water Conservation Board James Holiman, WD 40 Water Commissioner Scott Frost, WD 40 Water Commissioner Bill McCormick, Chief, Dam Safety Branch Jason Ward, Dam Safety Engineer



CONSTRUCTION INSPECTION REPORT

PROJECT INFORMATION				
Dam Name:	Ward Lake	Inspectors:	Jackie Blumberg	
DAMID:	40033	Date:	26Aug2020	
C-#:	C-0888A	Time on Site:		
Dam Owner:	Surface Creek Ditch & Reservoir Co.	Contact:	Keith Waibel (970-856-3165)	
Enginoor		Contact	Dan Quigley (970-497-8852)	
Engineer.	DOWL	contact.	Russ Reed (406-656-6399)	
			Wayne Balderton (970-683-1604) Tanner Lee (970-644-1678)	
Contractor:	Con-Sy	Contact:	Tom Lee (970-379-5729)	
			Dustin Roehm (on-site foreman) (970-	
			712-4890)	
Approved Plans	& Specifications On-site? 🗹 Yes 🗌 No	n-site? 🗹 Yes 🗌 No Engineer Following Const. Obs. Plan? 🔽 Yes 🗌 N		

INSPECTION PARTICIPANTS

Inspection Participants: Dan Quigley (DOWL) Wayne Balderton and crew (Con-Sy) Jason Ward, Jackie Blumberg (SEO)

CONDITIONS			
Reservoir:	Empty		
Weather:	Overcast, upper 60s		
Equipment:	Various equipment actively stockpiling, filtering and sorting		

CONSTRUCTION STATUS				
Work Completed	Potholing adjacent to existing outlet pipe			
to Date:	Breach excavation (sides)			
	Removal of old pipe			
	Excavate to subgrade			
	Dewatering and compacting subgrade to non-yielding surface			
	Fill placement to bring subgrade surface up to grade			
	Filter material test section and placement of filter material into trench per method specification			
	New pipe installation			
Work in Progress:	Filtering embankment material stockpile (ongoing)			
	Formwork and steel reinforcement for outlet encasement			
Work Planned and	Pipe encasement			
est. Timeframe:	Structural steel and forms for inlet and outlet structures			
	Form and pour inlet & outlet			

OBSERVATIONS AND DISCUSSION			
Purpose of	Formwork and steel reinforcement per sheets 10 and 11 of the approved plans for conduit		
Inspection:	structural steel (sheet 12, inlet structural steel, to be referenced at a later construction visit).		
Items Inspected:	Formwork and steel reinforcement		
	Steel clearance and overlap was measured and found to be generally commensurate with the approved plans. The angle of sidewall forms was measured at 7 degrees, which agrees well with the approved plans that show 5 degrees (12H:1V).		



	OBSERVATIONS AND DISCUSSION
	To ensure minimum clearance of structural steel above bare ground, Con-Sy has installed a workaround by suspending the structural steel cage from ties located every 6-feet. Chairs are to be installed along the forms to ensure 3-inch clearance, per the details on Sheets 10 and 11.
	Given the lack of available plugs for a 24-inch pipe, Con-Sy proposes to use an inflatable exercise ball to close the terminal end of the pipe, so that it may hold water and minimize buoyancy during concrete placement.
	DOWL discussed trimming the edge where the top of encasement meets the wall while concrete cures, to avoid a ridge that forms against the form that must be sanded off once the forms are removed.
	The first concrete pour is scheduled for 11:00am on Friday, 25 yards is expected to be delivered. Con-Sy to have backup generators and backup vibrators on site. Huddleston-Berry expected to be on site to collect cylinders for testing.
	The SEO discussed roughening of the surface, per specification 03 30 00.3.03.D.4.b, with Con-Sy. Sand-blasting will likely be used. The seven day requirement between pouring sections, per specification 03 30 00.3.03.D.3 was also discussed.
	Con-Sy plans to pour the intake structure and first section of pipe encasement as a monolith.
	The sand filter at station 1+20 was also observed. Con-Sy has protected the sand by overlying with a temporary blanket.
Items not in compliance with approved plans/specs:	None
Problems/Concerns/ Discussion:	Some flex of the HDPE pipe has occurred, due to variable temperatures on site, resulting in a slight horizontal bend to the right. Con-Sy proposes covering the pipe overnight with concrete blankets to minimize temperature impacts to the pipe and plans to pour concrete early in the day.
	The 4-inch blocks supporting the pipe may not offer sufficient resistance to pipe movement due to thermal expansion/contraction and a small belly was noticed by DOWL during an earlier inspection, which has since flattened out.
Design Change Orders:	none
Minor Changes:	none
Conclusions:	Current work appears to be in conformance with approved plans and specifications.
Action Items:	 (revisited) Plan for preparation and pre-forming of exposed benches in breach cut, prior to placement of embankment materials will be resolved by field directive provided by DOWL to Con-Sy. Revisited due to weathered appearance pre-formed benches exhibit and the wetting-drying cycle the material has undergone since benching was conducted one month ago (see CIR from 22JUL2020). There is concern that simply moisture conditioning the exposed material may not be sufficient to promote bonding with new embankment fill. At a minimum, the SEO would like to discuss the plan with DOWL's geotechnical engineer (reference specification sections 31 24 00.3.02.A and E) (resolved) DOWL, SEO and Con-Sy to discuss proper abandonment of the dewatering well and formulate a plan. One of two plans will occur: a. If access allows, apply lean concrete to well void, leaving HDPE pipe in place while curing begins, remove pipe prior to full curing; or b. Follow process outlined above using Sakrete rather than lean concrete. DOWL to coordinate with Con-Sy on removing in-place forms at station 1+60 to allow access for placing electrofusion flex restraints at 2, 6 and 10 o' clock positions, per detail C on sheet 11 of the plans.
	 Con-Sy to install wall chairs prior to concrete pour, to ensure 3-inch clearance between form wall and structural steel, per details shown on sheets 10 and 11 of the plans. Con-Sy to clean pipe prior to concrete pour.

chairs to be placed to ensure 3-inch clearance from wall

forms.

DSE

OBSERVATIONS AND DISCUSSION			
	6. Con-Sy to abandon the wells, per discussion with DOWL and the SEO.7. Abandoned well locations to be surveyed for inclusion on the as-constructed plans.		
Next Inspection:	Structural steel and formwork for inlet and outlet structures		

PHOTOGRAPHS Photo 1. Looking downstream into the HDPE pipe, a slight bend to the right is noted. Temperatures range from mid-Photo 2. Inlet side. Con-Sy is awaiting an appropriately sized gasket to be delivered to the site. to-low 40s in the evening to upper 60s during the day. Photo 3. Ties every 6-feet to suspend the structural steel cage a minimum of 3-inches above the ground. Sidewall Photo 4. Placing steel at the terminal end of the pipe.

ec: Dan Quigley, DOWL, <u>dquigley@dowl.com</u> Russell Reed, DOWL, <u>rreed@dowl.com</u> Loree Gutierrez, Surface Creek Ditch and Reservoir Company, <u>Gutierrez646@hotmail.com</u> Grand Mesa Water Users Association, <u>admin@gmwua.com</u> Wayne Balderston, Con-Sy, <u>wayne.consy@gmail.com</u> Tanner Lee, Con-Sy, <u>tannerllcsi@gmail.com</u> Tom Lee, Con-Sy, <u>csitomlee@aol.com</u> Rachel Pittinger, Colorado Water Conservation Board James Holiman, WD 40 Water Commissioner Scott Frost, WD 40 Water Commissioner Bill McCormick, Chief, Dam Safety Branch Jason Ward, Dam Safety Engineer



CONSTRUCTION INSPECTION REPORT

PROJECT INFORMATION				
Dam Name:	Ward Lake	Inspectors:	Jackie Blumberg	
DAMID:	40033	Date:	18Sept2020	
C-#:	C-0888A	Time on Site:	10:00 - 11:00	
Dam Owner:	Surface Creek Ditch & Reservoir Co.	Contact:	Keith Waibel (970-856-3165)	
Enginoor	DOWL	Contact	Dan Quigley (970-497-8852)	
Engineer:		CUITACT.	Russ Reed (406-656-6399)	
			Wayne Balderton (970-683-1604)	
Contractor:	Con-Sy	Contact:	Tanner Lee (970-644-1678)	
			Tom Lee (970-379-5729)	
			Dustin Roehm (on-site foreman) (970-	
			712-4890)	
Approved Plans & Specifications On-site? 🗹 Yes 🗌 No Engineer Following Const. Obs. Plan		ng Const. Obs. Plan? 🗹 Yes 🗌 No		

	DARTI	CIPAI	NTS

	Dan Quigley (DOWL)
Inspection	Dustin Roehm, Wayne Balderton and crew (Con-Sy)
Participants:	Keith Waibel (Surface Creek Ditch & Reservoir Co.)
	Jackie Blumberg (SEO)

CONDITIONS		
Reservoir:	Empty	
Weather:	Hazy, low 60s	
Equipment:	Wacker Nueson RTSC3 – embankment compaction	
	Deere 85G excavator and 350D loader – excavating stilling basin area	
	Various equipment for stockpiling, filtering and sorting - inactive	

CONSTRUCTION STATUS		
Work Completed	Potholing adjacent to existing outlet pipe	
to Date:	Breach excavation (sides)	
	Removal of old pipe	
	Excavate to subgrade	
	Dewatering and compacting subgrade to non-yielding surface	
	Fill placement to bring subgrade surface up to grade	
	Filter material test section and placement of filter material into trench per method specification	
	New pipe installation	
	Formwork and steel reinforcement for outlet encasement	
	Pipe encasement	
Work in Progress:	Filtering embankment material stockpile (ongoing)	
	Structural steel and forms - inlet structure	
Work Planned and	Form and pour inlet (tentatively 9/18/2020)	
est. Timeframe:	Begin backfill placement (start 9/21/2020)	





CONSTRUCTION INSPECTION REPORT

	OBSERVATIONS AND DISCUSSION
Purpose of	Formwork and steel reinforcement – inlet structure
Inspection:	
Items Inspected:	Formwork and steel reinforcement Confirmed structural steel has been placed per detail B on Sheet 12 of the approved plans. Number and spacing appear commensurate with the plans. During inspection, several dobies were placed to ensure 2-inch spacing between bottom steel and underlying gravel.
	Two #5 horizontal bars on the top of the concrete structure, reservoir side of the HDPE inlet are yet to be placed. DOWL agreed to take additional photographs before the concrete pour, tentatively scheduled for September 18.
	Embankment Placement DOWL and Con-Sy each collected several material density and moisture readings using a nuclear gauge, on both sides of the outlet and generally spaced throughout the work area. Testing indicated that four to five passes with the Wacker were sufficient to attain Proctor target values.
	Well Abandonment The dewatering wells appear properly abandoned, using excess concrete material from outlet encasement pour.
Items not in compliance with approved plans/specs:	None
Concerns/ Discussion:	Detail B on sheet 14 of the approved plans shows a rectangular void to be filled with filter sand. Given the sequencing of construction, suitable compaction of the sand within the void will be difficult to achieve. Con-Sy plans to block one side and then tamp the filter sand in using a square plate hand tamper.
	DOWL, Con-Sy and the SEO discussed favorable strength testing outcomes for the outlet encasement concrete. Strengths up to 75 percent were noted from 3-day tests and nearing 100 percent from 5-day tests.
	DOWL and SEO also discussed the field directive to encourage knitting between benched/breach material and new embankment (more detail below).
Design Change Orders:	none
Minor Changes:	none
Conclusions:	Current work appears to be in conformance with approved plans and specifications.
Action Items:	 DOWL to confirm two #5 horizontal bars on the top of the concrete structure, reservoir- side of the HDPE inlet, prior to concrete pour tentatively scheduled for Friday, September 18, at 11am. (retained, discussion continues) Plan for preparation and pre-forming of exposed benches in breach cut, prior to placement of embankment materials will be resolved by field directive provided by DOWL to Con-Sy. Revisited due to brief winter conditions (week of Sept 7th) and weathered appearance pre-formed benches exhibit and the wetting-drying cycle the material has undergone since benching was conducted one month ago (see CIR from 22JUL2020). There is concern that simply moisture conditioning the exposed material may not be sufficient to promote bonding with new embankment fill. At concern, the



OBSERVATIONS AND DISCUSSION		
	specification sections 31 24 00.3.02.A and E). Adequate disking, scarifying and moisture conditioning must occur at the interface to encourage proper knitting of the new and existing materials. DOWL indicated that material appeared to bond well when wetted, as was observed during the recent snowstorm event.	
Next Inspection:	TBD. DOWL to coordinate with the SEO.	

DSE


DSE



Photo 5. Overhead view of intake structure steel



Photo 7. Exterior view of formwork.



Photo 9. View of the outlet terminal headwall.



Photo 6. View into right sidewall



Photo 8. Rectangular void for filter sand, just upstream of outlet headwall (reference detail B on sheet 14).



Photo 10. DOWL and Con-Sy collect nuclear gauge readings of the embankment material.

ec: Dan Quigley, DOWL, <u>dquigley@dowl.com</u> Russell Reed, DOWL, <u>rreed@dowl.com</u> Loree Gutierrez, Surface Creek Ditch and Reservoir Company, <u>Gutierrez646@hotmail.com</u> Grand Mesa Water Users Association, <u>admin@gmwua.com</u> Wayne Balderston, Con-Sy, <u>wayne.consy@gmail.com</u> Tanner Lee, Con-Sy, <u>tannerllcsi@gmail.com</u> Tom Lee, Con-Sy, <u>csitomlee@aol.com</u> Rachel Pittinger, Colorado Water Conservation Board James Holiman, WD 40 Water Commissioner Scott Frost, WD 40 Water Commissioner Bill McCormick, Chief, Dam Safety Branch Jason Ward, Dam Safety Engineer



CONSTRUCTION INSPECTION REPORT

PROJECT INFORMATION			
Dam Name:	WARD LAKE	Inspector:	Jason Ward
DAMID:	400533	Date:	November 5, 2020
C-#:	C-0888A	Time on Site:	1100-1300
Dam Owner:	Surface Creek Ditch & Reservoir Company (SCDRC)	Contact:	Keith Waibel, 907-201-6481
Engineer:	DOWL	Contact:	Dan Quigley 970-596-4923 (c) Russ Reed (406) 656-6399
Contractor:	Con-Sy, Inc.	Contact:	Wayne Balderston, 970-683-1604 Tanner Lee, 970-644-1678 Tom Lee, 970-379-5729
Material QC	Huddleston-Berry	Contact:	
Approved Plans & Specifications On-site? 🗹 Yes 🗌 No		Engineer Follow	ing Const. Obs. Plan? 🗹 Yes 🔲 No

INSPECTION PARTICIPANTS

InspectionJason Ward (SEO)Participants:Wayne Balderston (Con-Sy)

CONDITIONS			
Reservoir:	Empty		
Weather:	Sunny, Cool		
Equipment:	Link 235x track excavator		
	John Deere 350D articulated dump truck		
	John Deer 225C track excavator		
	Yanmar Mini-Ex		

	CONSTRUCTION STATUS		
Work Completed	Breach Excavation		
to Date:	Foundation Prep		
	Outlet pipe installation and encasement		
	Filter Collar and Other filter construction		
	Upstream Intake Structure		
	Gate Placement		
	Air Vent and Gate Stem Casing		
	Downstream Outlet Structure		
	Stilling Basin		
	Embankment Fill		
	Gate Stem Support Piers		
	•		
Work in Progress:	Upstream Slope Riprap Placement		
	Gate Operator Support Block		
	Gate Stem and Air Vent clamp installation and attachment to Support Piers		



Work Planned and Gate Operator concrete placement - Friday Nov 6, 2020					
est. Timeframe: • Remaining site work and project completion - approx. 2 week look ahead					
	OBSERVATIONS AND DISCUSSION				
Purpose of Inspection	n: The purpose of the inspection was to observe reinforcement and formwork for the outlet gate				
	control support structure prior to concrete placement.				
	Due to impending weather, an overall pre-final site inspection of the site was also conducted.				
	Action items related to this portion of the inspection are listed below.				
Itoms Inspected:	"Cate Control Hand Wheel Support Structure" - Sheet 15				
nems inspected.	Reinforcement type geometry offsets etc. field verified according to Plans				
	 Dimensions of structure (formwork) field verified according to Plans 				
	 Sleeve for gate stem provided as 2" Schedule 40 PVC. 				
	• No material specification on Plans or Specs.				
	• Appears acceptable.				
	• Field adjustment of gate stem casing was made during the inspection by running a string				
	line along the stem casing from the intake structure to the downstream face of the				
	support structure. Elevations were adjusted by shimming the casing above the support				
	piers. After acceptable alignment was made, shims were added to centralize the PVC				
	sleeve about the gate stem.				
	Gate support structure forms and reinforcement judged in conformance with the				
	approved plans and acceptable for concrete placement.				
	Unstream Slope				
	Ongoing riprap placement during inspection appears acceptable				
	• The contractor asked if large boulders could line the toe of the slope (i.e "grandfather				
	boulders").				
	 Judgement and decision made to not allow large boulders and to terminate 				
	riprap at the toe of the dam uniformly with the remainder of the slope (no				
	"grandfather rocks").				
	 Large boulders acceptable to be used for access deterrents, protection around 				
	structures, etc.				
	Unstream Intake Structure / Outlet Cate:				
	 Intake structure inspection previously as acceptable 				
	Gate installation yet to be finalized: loosely bolted in place during inspection				
	Air Vent / Gate Stem Casing / Support Piers:				
	 All components in place and appear in conformance with Plans and Specs. 				
	 Stem Housing Clamps (Sheet 15) yet to be installed. 				
	<u>Crest</u> :				
	Uniform and appears and in general conformance with Plans and Specs				
	• Backfill and grading around Gate support structure yet to be completed.				
	Downstream Slone:				
	Uniformly graded: Field verified approx 2 5H-1V slope				
	 Slope vet to be seeded 				
	 Minor clean-up items listed below under Action Items. 				
	Downstream Outlet Structure:				
	Previously inspected as acceptable.				
	Minor clean-up items listed below under Action Items.				

	 <u>Stilling Basin:</u> Appears in general conformance with the Plans and Specs Minor clean-up and finishing items listed below under Action Items.
Items not in conformance with approved plans and specs:	None.
Problems/Concerns:	Impending weather and concern that remaining items cannot be completed prior to winter shutdown.
Design Change Orders:	None.
Minor Changes:	None.
Conclusions:	Reinforcement and formwork for the Gate Control Handwheel Support Structure appear in general conformance with the approved plans and specifications. Concrete placement should proceed as planned.An overall inspection of the project revealed only minor items that need cleanup or finishing prior to final acceptance. The Action Items listed below were reviewed with the contractor at the end of the inspection.
Action Items:	 Items identified during the inspection in need of clean-up or finishing in addition to remaining work yet to be completed: <u>Downstream slope:</u>
Next Inspection:	Final Construction Inspection

ec: Dan Quigley, DOWL, <u>dquigley@dowl.com</u> Loree Gutierrez, Surface Creek Ditch and Reservoir Company, <u>Gutierrez646@hotmail.com</u> Grand Mesa Water Users Association, <u>admin@gmwua.com</u> Wayne Balderston, Con-Sy, <u>wayne.consy@gmail.com</u> Tanner Lee, Con-Sy, <u>tannerllcsi@gmail.com</u> Tom Lee, Con-Sy, <u>csitomlee@aol.com</u> Rachel Pittinger, Colorado Water Conservation Board James Holiman, WD 40 Water Commissioner Scott Frost, WD 40 Water Commissioner Bill McCormick, Chief, Dam Safety Branch Jackie Blumberg, Dam Safety Engineer Overall view of breach repair section and upstream outlet works.





Gate Control Hand Wheel Support Structure concrete reinforcement and formwork.





Overall view of outlet structure and stilling basin. Notes included for contractor clean-up and finish items.



CONSTRUCTION INSPECTION REPORT

PROJECT INFORMATION Jason Ward Dam Name: WARD LAKE Inspector: Jackie Blumberg DAMID: 400533 Date: November 17, 2020 C-#: Time on Site: 1100-1300 C-0888A Surface Creek Ditch & Reservoir Company Dam Owner: Contact: Keith Waibel, 907-201-6481 (SCDRC) Dan Quigley 970-596-4923 (c) DOWL Engineer: Contact: Russ Reed (406) 656-6399 Wayne Balderston, 970-683-1604 Tanner Lee, 970-644-1678 Contractor: Con-Sy, Inc. Contact: Tom Lee, 970-379-5729 Material QC Huddleston-Berry Contact: Approved Plans & Specifications On-site? 🗹 Yes 🗌 No Engineer Following Const. Obs. Plan? 🗹 Yes 🗌 No

INSPECTION PARTICIPANTS

Inspection Participants: Jason Ward (Dam Safety Branch) Jackie Blumberg (Dam Safety Branch) James Holiman (Water Commissioner) Dan Quigley (DOWL) Keith Waibel (Owner) John Walker (Owner) Wayne Balderston (Con-Sy)

COLORADO Division of Water Resources Department of Natural Resources

Dam Safety

CONDITIONS

	CONDITION
Reservoir:	Empty
Weather:	Sunny, Cool, upper 40s
Equipment:	Link 235x track excavator (inactive)

CONSTRUCTION STATUS			
Work Completed	Substantial completion.		
to Date:			
Work in Progress:	Gate Stem and Air Vent clamp installation and attachment to Support Piers		
Work Planned	Final construction items and demobilization within next 2-days.		
and est.			
Timeframe:			



	OBSERVATIONS AND DISCUSSION
Purpose of Inspection:	Dam Safety Branch project final inspection in accordance with Rule 8.2.6
Items Inspected:	All components of the project were inspected for completion and conformance with the approved Plans and Specifications. Inspection limited to conformation of remaining items from November 11, 2020 Construction Inspection Report.
	<u>Outlet Works - Upstream Structure and Gate</u> Complete and in general conformance with the approved Plans and Specifications. The gate was operated through the full range with no issues noted. Further, the Owner mentioned Core and Main (gate vendor) viewed the gate and provided verbal approval following installation.
	<u>Outlet Works - Gate stem, Air Vent, Staff Gage</u> Complete and in general conformance with the approved Plans and Specifications. Owner to cover exposed gate stem segment (see punch list below). Con-Sy mentioned the bio-oil for the gate stem has been ordered. Numbered metal plates are positioned on the staff gauge so that the center of the number equals the reservoir level. Tenth marks are scribed into the galvanized air vent pipe in accordance with the Plans.
	Outlet Works - Gate Control Support Structure Complete and in general conformance with the approved Plans and Specifications.
	Outlet Works - Downstream Headwall Complete and in general conformance with the approved Plans and Specifications.
	<u>Outlet Works - Stilling Basin</u> Complete and in general conformance with the approved Plans and Specifications. The team discussed blending the corners/ends of the basin to the natural channel downstream. However, it was decided that natural processes from relatively low normal operational flows (5-10 cfs max.) will likely shape the terminal end of the basin.
	<u>Dam Crest:</u> Complete and in general conformance with the approved Plans and Specifications. The DSB requested a small volume of acceptable fill to be placed left of the outlet operator, which appeared locally low, and graded to allow adverse drainage toward the downstream slope (see punch list below).
	Upstream Slope: Complete and in general conformance with the approved Plans and Specifications.
	Downstream Slope: Complete and in general conformance with the approved Plans and Specifications.
	<u>Spillway:</u> Restored to original condition.
Items not in conformance with approved plans and specs:	None.
Problems/Concerns/ Discussion:	The team discussed stage-storage information and concluded the curve based on 2016 Delta County LiDAR would be shown in the completion plan set if the Owner elects to not conduct a drone survey during near-empty conditions.

	 The team also discussed allowing temporary storage within the reservoir. Subsequent to the inspection, our office received a formal request from the Engineer to allow temporary storage up to gage height of 11 ft. The Owner intends to provide a cover for the small segment of exposed gate stem just below the thrust block, to prohibit tampering. Con-Sy provided video inspection of the outlet to the DSB via thumb drive. A punch list of minor items was developed. The Engineer anticipates conducting a site visit on Friday, November 20, 2020, to confirm resolution of: Installation of remaining six of seven gate stem clamps; Minor grading of the crest left of the outlet thrust block, which appeared locally low during closeout inspection; Removal of the cofferdam(s); Application of approved seed mix; Pulling stakes and wattles, general site cleanup
Design Change Orders:	None.
Minor Changes:	None.
Conclusions:	Results of the inspection show the project complete and in general conformance with the approved plans and specifications. A request for temporary approval in accordance with Rule 8.3.3 is anticipated from the Engineer on behalf of the Owner. Conversations during the inspection resulted in an agreed upon partial fill level request to gage height 11-ft. It is anticipated that the reservoir will fill to less than gage height 21 ft (normal high water line) in Spring 2021 given the current drought conditions and historic runoff from the drainage basin. Therefore, a partial fill to gage height 11 ft is in conformance with Rule 8.3.3 as well as within the reasonably expected fill elevation for the reservoir given current conditions. Based on results of the inspection, it is recommended that the request be granted upon receipt from the Engineer.
Action Items:	Completion documents by the deadline promised in the anticipated temporary approval to store water request.
Next Inspection:	2021 annual safety inspection or by request from the Owner.

ec: Dan Quigley, DOWL, <u>dquigley@dowl.com</u> Loree Gutierrez, Surface Creek Ditch and Reservoir Company, <u>Gutierrez646@hotmail.com</u> Grand Mesa Water Users Association, <u>admin@gmwua.com</u> Wayne Balderston, Con-Sy, <u>wayne.consy@gmail.com</u> Tanner Lee, Con-Sy, <u>tannerllcsi@gmail.com</u> Tom Lee, Con-Sy, <u>tannerllcsi@gmail.com</u> Rachel Pittinger, Colorado Water Conservation Board James Holiman, WD 40 Water Commissioner Scott Frost, WD 40 Water Commissioner Bill McCormick, Chief, Dam Safety Branch Jackie Blumberg, Dam Safety Engineer



View looking down upstream slope along gate stem and air vent alignment.



Outlet gate intake structure and trashrack.







Close-up of typical 1-foot interval number plates and air vent scribes for staff gage tenths of feet.

Typical support pier with air vent and gate stem clamps.





Dam crest area just left gate operator support structure in need of minor grading to fill in low spot and correct drainage.

APPENDIX B

WEEKLY CONSTRUCTION SUMMARY REPORTS

Ward Lake Dam Outlet Rehabilitation Final Construction Report Page 7 of 12



Page	1	of 2	
	-		

Client:	Surface Creek Ditch & Reservoir Company	W.O: 7122.74844.01
Project:	Ward Lake Dam Outlet Replacement	Week of: 7/13-7/17
Contact:	Keith Waibel	

Inspector: D. Quigley	PE	Submitted:
Signature:		9/10/20
		Reviewed by/Date:

Summary of Weekly Activities

Monday, July 13th: 2:00 p.m. Site kickoff meeting with the following attendees: Dan Quigley (DOWL), Jackie Blumberg and Jason Ward (CDWR), Keith Waibel and John Walker (SCDRC), Loren Paulson (USFS), Tom Lee, Dustin Roehm, Wayne Balderson (ConSy). Reviewed the proposed schedule and discussed the importance of a water control plan for the excavation. ConSy has engaged an engineer to develop the plan and will submit when ready. Excavation is expected to take 2 weeks and Dustin Roehm will be ConSy's employee on site for security.

Wednesday, July 15th: 1:45 p.m. Field meeting at the dam site with Jason Ward (CDWR) and Dustin Roehm (ConSy, Inc.). Discussed schedule for excavating the existing breach to plan limits. Dustin will be sole ConSy employee performing this work. He anticipates 2 weeks to complete excavation to subgrade elevation. Water control plan is still pending and will be required prior to beginning work on the outlet replacement. Only equipment on site was LinkBelt Trackhoe. East side of breach was being excavated by Dustin prior to our visit. Dustin excavated a small test pit on the east side of the outlet pipe at approximately STA 1+00 to observe site soils and anticipated conditions. Weather was generally clear, 75 degrees F with no precipitation.

Thursday, July 16th: 9:30 a.m. Dan Quigley on site to observe excavation progress. Dustin Roehm (ConSy) was actively excavating east side of the existing breach per plan sheet OW1. Weather was generally clear, 75 degrees F with no precipitation. LinkBelt Trackhoe was the only equipment in use during our visit.



Page 2 of 2

Client:	Surface Creek Ditch & Reservoir Company	W.O: 7122.74844.01
Project:	Ward Lake Dam Outlet Replacement	Week of: 7/13-7/17
Contact:	Keith Waibel	



Photo 1. View looking east at existing breach excavation on July 16, 2020.



Photo 2. View looking northeast at erosion control measures of inlet channel and HDPE pipe for the outlet.



Photo 3. View of breach and outlet prior to start of project. Photo taken on July 13, 2020.



Photo 4. View of test pit excavated on the east side of the existing steel outlet pipe to observe site soils.



Page 1 of 2

Client:	Surface Creek Ditch & Reservoir Company	W.O: 7122.74844.01
Project:	Ward Lake Dam Outlet Replacement	Week of: 7/20-7/24
Contact:	Keith Waibel	

Inspector: D. Quigley	PE	Submitted:
Signature:		9/10/20
		Reviewed by/Date:

Summary of Weekly Activities

Wednesday, July 22nd: 1:00 to 3:00 p.m. Field meeting at the dam site with Jason Ward (CDWR) Dustin Roehm (ConSy, Inc.) and Keith Waibel (SCDRC). East side of breach was being excavated by Dustin prior to our visit. Pocket of blue clay observed approximately 15 below the crest on the east side. Appears to be an isolated pocket of lean clay that is consistent with specified embankment fill material. Contractor has excavated the east side in 1-foot benches per Sheet OW4 of the approved project plans. Jason was concerned about surface prep and removal of obvious rocks and properly filling the voids prior to embankment fill. ConSy to develop embankment fill plan that includes dealing with rocks and surface voids. We also discussed the need for moisture conditioning prior to placing each lift of embankment to "seal" the clay of any desiccation cracks created between excavation and backfill. Weather was partially cloudy, 75 degrees F with no precipitation. Equipment in use on site was: LinkBelt 235 trackhoe, John Deere 225C trackhoe and John Deere 350D Haul truck

Friday, July 25th: 9:30 a.m. Dan Quigley on site to observe excavation progress. Dustin Roehm (ConSy) was actively excavating east side of the existing breach per plan sheet OW1. Weather was overcast, 65 degrees F with threatening precipitation. Equipment in use on site was: LinkBelt 235 trackhoe, John Deere 225C trackhoe and John Deere 350D Haul truck



Page 2 of 2

Client:	Surface Creek Ditch & Reservoir Company	W.O: 7122.74844.01
Project:	Ward Lake Dam Outlet Replacement	Week of: 7/20-7/24
Contact:	Keith Waibel	





Page 1 of 2

Client:	Surface Creek Ditch & Reservoir Company	W.O: 7122.74844.01
Project:	Ward Lake Dam Outlet Replacement	Week of: 8/3/20 to 8/7/20
Contact:	Keith Waibel	

Inspector: D. Quigley	PE	Submitted:
Signature:		9/10/20
		Reviewed by/Date:

Summary of Weekly Activities

NOTE: No report for the week of July 27 to July 31. Phone conversations with ConSy superintendent, Wayne Balderston, indicted that ConSy was still actively excavating the west side of the breach and the outlet channel in anticipation of a subgrade prof-roll test around August 7th.

Monday, August 3rd: **1:00 to 1:30 p.m.** Field meeting at the dam site with Jason Ward (CDWR) and Dustin Roehm (ConSy) for excavation progress observation. Weather was sunny, 75 degrees F with no precipitation. Equipment in use on site was: LinkBelt 235 trackhoe, John Deere 225C trackhoe and John Deere 350D Haul truck.

Wednesday, August 5th: 10:00 to 10:45 a.m Field meeting at the dam site with Jackie Blumberg (CDWR) and Dustin Roehm for forensic observation of the existing outlet pipe and excavation progress. We observed the condition of the existing steel outlet pipe and the surrounding soils. Planned for subgrade proof-roll test on August 7th. Weather was sunny and 75 degrees F with threatening precipitation. Equipment on site was: LinkBelt 235 trackhoe, John Deere 225C trackhoe, Cat 350D loader and John Deere 350D Haul truck.

Friday, August 7th: 10:00 to 10:45 a.m Field meeting at the dam site with Jackie Blumberg (CDWR) and Dustin Roehm for planned subgrade proof-roll test. Contractor had not excavated down to subgrade elevation of 10,094.0 feet and was not ready for test. We observed the condition of the existing steel outlet pipe and the surrounding soils. Planned for subgrade prof-rool test on August 7th. Weather was sunny and 75 degrees F with threatening precipitation. Equipment on site was: LinkBelt 235 trackhoe, John Deere 225C trackhoe, Cat 350D loader and John Deere 350D Haul truck. ConSy plans to have subgrade exposed and ready for proof-roll test on 8/10/20.



Page 1 of 2

Client:	Surface Creek Ditch & Reservoir Company	W.O: 7122.74844.01
Project:	Ward Lake Dam Outlet Replacement	Week of: 8/10/20 to 8/14/20
Contact:	Keith Waibel	

Inspector: D. Quigley	PE	Submitted:
Signature:		9/10/20
		Reviewed by/Date:

Summary of Weekly Activities

Tuesday, August 11th: **19:00 to 10:00 a.m.** Field meeting at the dam site with Jason Ward (CDWR) and Wayne Balderston (ConSy) to observe groundwater issue at subgrade elevation and discuss proposed dewatering plan. 3-6 inches of standing water was observed on the subgrade with sloughing of excavation sidewalls visible. Parties agreed that 3-4 vertical dewatering wells placed on the outside edges of the outlet channel would be an appropriate solution. ConSy subsequently installed three (3) vertical 12-inch perforated PVC pipes with 3/4 crushed aggregate and electric sump pumps with outlet connected to the existing bypass pipe. Weather was overcast and 75 degrees F with no precipitation. Equipment in use on site was: LinkBelt 235 trackhoe, John Deere 225C trackhoe and John Deere 350D Haul truck.

Friday, August 14th: 10:00 to 10:45 a.m Field meeting at the dam site with Jackie Blumberg (CDWR) and Tom Lee, Wayne Balderston and Dustin Roehm for subgrade proof-roll test. Subgrade had been dewatered using the wells mentioned above and passed proof-roll test after 5 passes of a loaded 3-axle Kenworth dump truck. Subgrade was approved after two soft areas were removed and recompacted using suitable embankment material and a sheepsfoot compactor. Final subgrade surface appeared to be unyielding and was approved for construction of the outlet pipe and associated outlet works. Weather was sunny and 75 degrees F with threatening precipitation. Equipment on site was: LinkBelt 235 trackhoe, John Deere 225C trackhoe, Cat 350D loader and John Deere 350D Haul truck. ConSy plans to have subgrade exposed and ready for proof-roll test on 8/10/20.



Page	2	of	2

Client:	Surface Creek Ditch & Reservoir Company	W.O: 7122.74844.01
Project:	Ward Lake Dam Outlet Replacement	Week of: 8/10/20 to 8/14/20
Contact:	Keith Waibel	



Photo 1. View looking north at outlet channel prior to subgrade proof-roll test on August 14, 2020.



Photo 2. Close-up one of three dewatering wells installed by ConSy. PVC and PureCore pipe connects to the outlet bypass pipe..



Photo 3. View looking north at subgrade prior to proof-roll test.



Photo 4. View looking south towards outlet of subgrade after proof-roll test.



Page 1 of 2

Client:	Surface Creek Ditch & Reservoir Company	W.O: 7122.74844.01
Project:	Ward Lake Dam Outlet Replacement	Week of: 8/17/20 to 8/21/20
Contact:	Keith Waibel	

Inspector: D. Quigley	PE	Submitted:
Signature:		9/10/20
		Reviewed by/Date:

Summary of Weekly Activities

Wednesday, August 19th: **9:00 to 10:00 a.m.** Field meeting at the dam site with Jackie Blumberg (CDWR) and Wayne Balderston (ConSy) to observe placement of sand diaphragm test section and to establish a method control for placing and compacting the diaphragm sand per Section 31 24 00C of the approved technical specifications. Con-Sy excavated a 3-foot wide trench at STA 1+20 and approximately 6 inches of standing water was observed. Approximately 1 foot of filter sand was placed by excavator bucket into the trench and the material was moistened prior to testing. Dan Quigley performed nuclear density gauge testing for the test section placement. The first test was halted since the material was at 20.4% moisture content and was too wet to process. That material was removed and replaced with new, clean, dry sand. This was moisture conditioned using a garden hose from a water truck of potable water prior to compacting with a Wacker plate compactor. It was determined that 2 passes with the plate compactor provided adequate density without overcompacting the material. Weather was overcast and 75 degrees F with no precipitation. Equipment in use on site was: Wacker plate compactor, water truck and John Deere 225C trackhoe.

	Wet density (pcf)	Dry Density (pcf)	% Moisture
Base Conditions	103.5	93.1	11.2
Pass #1	109.5	100.1	9.4
Pass #2	109.9	101.8	7.9
Pass #3	110.1	102.1	7.8



Page	2	of	2
- "5"	_	U 1	_

Client:	Surface Creek Ditch & Reservoir Company	W.O: 7122.74844.01
Project:	Ward Lake Dam Outlet Replacement	Week of: 8/17/20 to 8/21/20
Contact:	Keith Waibel	



Photo 1. View looking east at sand diaphragm trench at STA 1+20 on 8/19/20. Note water truck dump truck of clean sand and excavator used to place the sand material.



Photo 2. Moisture conditioning filter sand for Test #2. Note color variation between wet and dry sand.



Photo 3. View looking east at sand diaphragm test section.



Photo 4. View looking east at initial test section which was too wet for compliant filter sand installation and which was subsequently removed prior to Test #2.



Page 1 of 3

Client:	Surface Creek Ditch & Reservoir Company	W.O: 7122.74844.01
Project:	Ward Lake Dam Outlet Replacement	Week of: 8/24/20 to 8/21820
Contact:	Keith Waibel	

Inspector: D. Quigley	PE	Submitted:
Signature:		9/10/20
		Reviewed by/Date:

Summary of Weekly Activities

Wednesday, August 26th: **1:30 to 3:00 p.m.** Field meeting at the dam site with Jackie Blumberg and Jason Ward (CDWR) and Wayne Balderston (ConSy) to inspect formwork and reinforcing steel for the 24-inch diameter DR-11 HDPE outlet pipe encasement. Reinforcing steel and formwork was in general conformance to the project plans and specifications with the exception that the HDPE flex restraint at STA 1+60 was missing. This was subsequently installed by fusion prior to the concrete placement on August 28th. (See 8/28/20 notes below). Formwork walls were measured to be approximately 7 degrees which is close to the design angle of 5 degrees and determined to be acceptable. ConSy plans on placing concrete for the first three sections of pipe encasement on 8/28/20. Weather was overcast and 65 degrees F with no precipitation. Equipment in use on site was: John Deere 225C trackhoe excavator. John Deer 350D dump truck and LinkBelt 235 trackhoe.

Friday, August 28th: 10:00 a.m.to 12:00 p.m. DOWL staff were on site to observe placement of concrete and provide Quality Assurance testing of ready-mix concrete places in the formwork approved on August 26th. Confirmed installation of HDPE flex restraint at STA 1+60. Observed placement of approximately 27 yards of concrete provided by Whitewater Materials in Grand Junction. (See separate construction materials testing results). Concrete appeared to meet project specifications for field quality and placement. Quality Control (QC) was provided by Huddleston-Berry (H-B) on behalf of the contractor. Both DOWL and H-B molded ten 4"x8" concrete cylinders for compressive strength testing. 5 cylinders will be field cured and 5 will be laboratory cured per Specification Section 03 30 00.



Page 2 of 3

Client:	Surface Creek Ditch & Reservoir Company	W.O: 7122.74844.01
Project:	Ward Lake Dam Outlet Replacement	Week of: 8/24/20 to 8/21820
Contact:	Keith Waibel	



Photo 1. View looking north at HDPE outlet pipe encasement formwork and reinforcing steel.



Photo 3. Concrete placement of truck 2 of 3 on August 28, 2020.



Photo 2. Closeup of fused HDPE flex restraint installed at STA 1+60 per plans.



Photo 4. View of typical plywood bulkhead between 20-foot segments of encasement. 2"x4" wood crossbeam at top of photo is typical of 6-foot spacing for wire ties to provide required 5-inch spacing of rebar above the pipe during concrete placement



Page 3 of 3

Client:	Surface Creek Ditch & Reservoir Company	W.O: 7122.74844.01
Project:	Ward Lake Dam Outlet Replacement	Week of: 8/24/20 to 8/21820
Contact:	Keith Waibel	



Page 1 of 2

Client:	Surface Creek Ditch & Reservoir Company	W.O: 7122.74844.01
Project:	Ward Lake Dam Outlet Replacement	Week of: 9/7 to 9/11
Contact:	Keith Waibel	
T		

Inspector: D. Quigley	PE	Submitted:
Signature:		9/21/20
		Reviewed by/Date:

Summary of Weekly Activities

Note: No site visit the week of August 31st to September 4th due to Labor Day holiday and snow/rain on site. ConSy performed minimal work that week including beginning to form outlet structure. Additional snow and rain fell on site on 9/9 and 9/10.

Friday, September 10:30 a.m. to 12:15 p.m. Site visit to observe concrete placement at outlet structure by ConSy crew. Concrete provided by Whitewater Materials and was tested by both Huddleston-Berry (QC) and DOWL (QA) staff members. All field tests met project specifications. (See separate CMT documents for field and laboratory concrete test results) Weather was mostly sunny and 65 degrees F with no precipitation. In addition to concrete placement equipment, other equipment in use on site was: John Deere 225C trackhoe excavator. John Deer 350D dump truck and LinkBelt 235 trackhoe.



Page 2 of 2

Client:	Surface Creek Ditch & Reservoir Company	W.O: 7122.74844.01
Project:	Ward Lake Dam Outlet Replacement	Week of: 9/7 to 9/11
Contact:	Keith Waibel	



Photo 1. View looking south at concrete placement for the outlet structure.



Photo 2. Closeup of fused HDPE inlet pipe prior to forming inlet structure.



Photo 3. ConSy crew grouting in the dewatering wells with concrete.



Photo 4. View of concrete blankets used to protect outlet formwork from rain and snow. Note dark areas of the embankment from precipitation events on 9/9 and 9/10.



Page 1 of 3

Client:	Surface Creek Ditch & Reservoir Company	W.O: 7122.74844.01
Project:	Ward Lake Dam Outlet Replacement	Week of: 9/14 to 9/18
Contact:	Keith Waibel	

Inspector: D. Quigley	PE	Submitted:
Signature:		9/21/20
		Reviewed by/Date:

Summary of Weekly Activities

Wednesday, September 16th: 10:00 to 11:00 a.m. Field meeting at the dam site with Jackie Blumberg (CDWR) and Wayne Balderston (ConSy) to inspect formwork and reinforcing steel for the inlet structure. Reinforcing steel and formwork was in general conformance to the project plans and specifications with the exception that the three #5 horizontal bars at the upstream end of the structure were missing since a ConSy crew member was still tying rebar inside the structure. This was subsequently installed prior to the concrete placement on September 18th. ConSy plans on placing concrete for the inlet structure on September 18th. Dan Quigley (DOWL) also took three density test in the backfill on both sides of the outlet pipe encasement with Huddleston-Berry staff performing QC testing in the same locations. One test did not meet project specifications for density so area was reworked by ConSy and subsequently was tested and met project specifications for moisture and density.Weather was overcast and 65 degrees F with no precipitation. Equipment in use on site was: John Deere 225C trackhoe excavator. John Deer 350D dump truck and LinkBelt 235 trackhoe

Friday, September 10:30 a.m. to 12:15 p.m. Site visit to observe concrete placement at outlet structure by ConSy crew. Concrete provided by Whitewater Materials and was tested by both Huddleston-Berry (QC) and DOWL (QA) staff members. All field tests met project specifications. (See separate CMT documents for field and laboratory concrete test results) Weather was mostly sunny and 65 degrees F with no precipitation. In addition to concrete placement equipment, other equipment in use on site was: John Deere 225C trackhoe excavator. John Deer 350D dump truck and LinkBelt 235 trackhoe.



Page 2 of 3

Client:	Surface Creek Ditch & Reservoir Company	W.O: 7122.74844.01
Project:	Ward Lake Dam Outlet Replacement	Week of: 9/14 to 9/18
Contact:	Keith Waibel	



Photo 1. Close-up view of inlet structure reinforcing steel. Note gap in horizontal bars above the ConSy staff member.



Photo 2. Closeup of inlet reinforcing steel placement.



Photo 3. Close-up of inlet wall reinforcement. 2inch wall chairs were installed prior to placement on the 18th to provide required separation



Photo 4. View of remotely operated compactor used to compact the first 3-feet of embankment adjacent to the outlet pipe encasement section.



Page 3 of 3

Client:	Surface Creek Ditch & Reservoir Company	W.O: 7122.74844.01
Project:	Ward Lake Dam Outlet Replacement	Week of: 9/14 to 9/18
Contact:	Keith Waibel	



Photo 1. Rip-Rap placement at outlet spillway taking place concurrently with the inlet structure concrete placement on 9/18/20



Photo 2. Concrete placement at inlet structure using conveyor belt and tremie.



Photo 3. Close-up of inlet wall reinforcement during concrete placement on 9/18/20.



Photo 4. View looking south at the outlet channel on 9/18/20. Backfill is approximately at the top of eh outlet pipe concrete encasement.



Page 1 of 3

Client:	Surface Creek Ditch & Reservoir Company	W.O: 7122.74844.01
Project:	Ward Lake Dam Outlet Replacement	Week of: 9/21 to 9/25
Contact:	Keith Waibel	

Inspector: D. Quigley	PE	Submitted:
Signature:		9/30/20
		Reviewed by/Date:

Summary of Weekly Activities

Friday, September 25th, 11:45 a.m. to 12:15 p.m. Site visit to observe progress of dam construction. Trash rack had been installed on the inlet structure. Con-Sy crew was on lunch break and not working at the time of our visit. Embankment had been placed to approximately 3 feet above the concrete encasement of the outlet pipe. Con-Sy was planning on screening material for he remainder of the day and wait to begin placing embankment fill on the first bench until after a scheduled visit by Dan Quigley (DOWL) and Jason Ward (CDWR-Dam Safety) on Monday, September 28th. Keith Waibel (SCDRC president) also visited the site during our visit. No equipment operating during our visit, Weather was sunny, clear and 65 degrees.



Page 2 of 3

Client:	Surface Creek Ditch & Reservoir Company	W.O: 7122.74844.01
Project:	Ward Lake Dam Outlet Replacement	Week of: 9/21 to 9/25
Contact:	Keith Waibel	-



Photo 1. Close-up of inlet structure looking downstream.



Photo 2. View looking south (Downstream) at embankment fill above the outlet pipe encasement. Note inlet structure on the lower left of the photo.



Photo 3. Close-up of the outlet structure and stilling basin rip-rap



Photo 4. View looking west across the outlet channel embankment.



Page 1 of 3

Client:	Surface Creek Ditch & Reservoir Company	W.O: 7122.74844.01
Project:	Ward Lake Dam Outlet Replacement	Week of: 9/28 to 10/2
Contact:	Keith Waibel	

Inspector: D. Quigley	PE	Submitted:
Signature:		9/30/20
		Reviewed by/Date:

Summary of Weekly Activities

Monday, September 28th, 9:30 a.m. to 10:30 a.m. Site visit to observe embankment methodology by Dan Quigley (DOWL) and Jason Ward (CDWR-Dam Safety). Observed Con-Sy crew water subgrade and first 4 feet of the benches on both sides of the outlet channel. Con-Sy placed stockpiled embankment material in approximate 8-9-inch loose lift using a Cat dump truck and Cat D5 dozer with curved blade. Operator mixed loose material at the base of the first bench with the new material. Jason and I suggested that additional water be placed on the subgrade since the windy dry conditions were wicking away the previously placed water prior to backfill material being placed on the subgrade. First lift was not complete or compacted at the time of my departure. Keith Waibel (SCDRC) was also present to observe the methodology demonstration. Keith Waibel (SCDRC president) also visited the site during our visit. Weather was sunny, clear, breezy and 36 degrees.



Page 2 of 3

Client:	Surface Creek Ditch & Reservoir Company	W.O: 7122.74844.01
Project:	Ward Lake Dam Outlet Replacement	Week of: 9/28 to 10/2
Contact:	Keith Waibel	



Photo 1. View looking south (downstream) at water truck wetting subgrade prior to embankment material placement. Note previously moistened benches to the left of the water truck



Photo 2. View looking south (downstream) at water truck moisture conditioning the subgrade prior to material placement.



Photo 3. Close-up Cat D5 dozer used to mix and spread embankment material. Note curved blade.



Photo 4. View looking south (downstream) at D5 Cat dozer spreading embankment soil on the first benched lift.


Page 1 of 2

Client:	Surface Creek Ditch & Reservoir Company	W.O: 7122.74844.01
Project:	Ward Lake Dam Outlet Replacement	Week of: 10/5 to 10/9
Contact:	Keith Waibel	

Inspector: D. Quigley	PE	Submitted:
Signature:		9/30/20
		Reviewed by/Date:

Summary of Weekly Activities

Wednesday, October 7th, 10:00 a.m. to 11:30 a.m. Site visit to observe embankment methodology by Dan Quigley, who also performed Quality Assurance density testing by nuclear method during his visit. Con-Sy placed stockpiled embankment material in approximate 8-9-inch loose lift using a Cat dump truck and Cat D5 dozer with curved blade. Operator mixed loose material at the base of each bench with the new material prior to compaction using an Ingersoll-Ran single drum sheepsfoot compactor to achieve required density. Weather was sunny, clear and 45 degrees.



Page 2 of 2

Client:	Surface Creek Ditch & Reservoir Company	W.O: 7122.74844.01
Project:	Ward Lake Dam Outlet Replacement	Week of: 10/5 to 10/9
Contact:	Keith Waibel	



Photo 1. View looking east completed embankment lifts. Note previously moistened benches to the left of the water truck



Photo 2. View looking south (downstream) at single drum sheepsfoot compactor during lift compaction on the east side of the breach.



Photo 3. View of embankment material screening plant processing embankment materials prior to placement.



Photo 4. View looking west across breach at typical test location for nuclear moisture-density testing.



Page 1 of 2

Client:	Surface Creek Ditch & Reservoir Company	W.O: 7122.74844.01
Project:	Ward Lake Dam Outlet Replacement	Week of: 10/12 to 10/16
Contact:	Keith Waibel	

Inspector: D. Quigley	PE	Submitted:
Signature:		9/30/20
		Reviewed by/Date:

Summary of Weekly Activities

Monday, October 12th, 10:00 a.m. to 11:30 a.m. Site visit to observe embankment methodology by Dan Quigley, who also performed Quality Assurance density testing by nuclear method during his visit. Con-Sy placed stockpiled embankment material in approximate 8-9-inch loose lift using a Cat dump truck and Cat D5 dozer with curved blade. Operator mixed loose material at the base of each bench with the new material prior to compaction using an Ingersoll-Rand single drum sheepsfoot compactor to achieve required density. Weather was sunny, clear and 45 degrees. (See separate field density test results from DOWL and Huddleston-Berry in Appendix C)

Friday, October 16th, 11:00 a.m. to 12:00 p.m. Site visit by Dan Quigley (DOWL) and Jason Ward (SEO) for unofficial visit to observe embankment progress. Dan Quigley also took nuclear moisture-density tests for Quality Assurance. Tests met project specifications for moisture and density. (See separate daily density test results in Appendix C). Weather was clear, sunny and 40 degrees. Equipment in use included D5 dozer, Ingersoll-Rand sheepsfoot compactor and CAT haul truck.



Page 2 of 2

Client:	Surface Creek Ditch & Reservoir Company	W.O: 7122.74844.01
Project:	Ward Lake Dam Outlet Replacement	Week of: 10/12 to 10/16
Contact:	Keith Waibel	



Photo 1. View of loading operation of screened embankment material for placement of on the next embankment lift.



Photo 2. View looking south (downstream) at inlet structure with trash rack installed. Fresno gate was delivered to site that date.



Photo 3. View of embankment material being dumped prior to spreading by D5 dozer



Photo 4. View of compaction of material spread in 8-9 inch lifts. Dump truck is in the background preparing to deliver more screened embankment material



Page 1 of 2

Client:	Surface Creek Ditch & Reservoir Company	W.O: 7122.74844.01
Project:	Ward Lake Dam Outlet Replacement	Week of: 11/16 to 11/20
Contact:	Keith Waibel	

Inspector: D. Quigley	PE	Submitted:
Signature:		11/30/20
		Reviewed by/Date:

Summary of Weekly Activities

Tuesday, November 17th, 11:00 a.m. to 1:00 p.m. Site visit for final inspection. Attendees included Dan Quigley (DOWL), Jason Ward and Jackie Blumberg (SEO), Keith Waibel and John Walker (SCDRC), Jim Holiman (CDWR- Water Commissioner) and Wayne Balderston (Con-Sy). Approximately 12 inches of snow covered the site and we inspected and operated the Fresno outlet gate. Outstanding items to complete were:

- Final grading of dam crest to promote surface drainage back towards the reservoir
- Two (2) missing anchor brackets for gate stem piping and elevation markers for 5 and 6-foot levels
- Seeding of downstream face
- Upstream coffer dam required to be removed

Dam was approved for limited filling to the 11.0-foot elevation until completion report is approved by SEO. Inlet gate was closed during our visit.

Friday, November 20th, 11:00 to 11:30 a.m. Site visit by Dan Quigley (DOWL) to confirm outstanding items from 11/17/2020 final inspection were completed. Confirmed that anchors and elevation plates had been installed, coffer dam removed and Con-Sy staff was on site hand broadcasting seed on required revegetation areas. Weather was overcast, breezy and 30 degrees.



Page 2 of 2

Client:	Surface Creek Ditch & Reservoir Company	W.O: 7122.74844.01
Project:	Ward Lake Dam Outlet Replacement	Week of: 11/16 to 11/20
Contact:	Keith Waibel	-



Photo 1. View of inlet structure looking up the upstream dam face. Gate stem is visible in the upper portion of the photo



Photo 2. Detail of typical gate stem support pier at the 23-foot level marker.



Photo 3. Close-up view of outlet gate control wheel block. Photo taken on 11/20/2020.



Photo 4. View looking north at Deep Ward Lake. Note inlet structure at bottom of photo. Photo taken on 11/20/2020.

APPENDIX C

MATERIALS TESTING RESULTS

Ward Lake Dam Outlet Rehabilitation Final Construction Report Page 8 of 12

APPENDIX C.1

QUALITY CONTROL TESTS BY HUDDELSTON-BERRY

Ward Lake Dam Outlet Rehabilitation Final Construction Report Page 9 of 12





(-) 200 WASH & SIEVE ANALYSIS CP- 31

Project #: 01594-0009

Sample #: 20-0576

Sampled By: KC

Sample Date: 8/17/20

Project Name: Con-Sy Ward Lake

Sample Location: New Screened Stockpile

Type of Material: Native

Comments: -

Sieve				Cumulative		
Size		Weight		Percent	Specification	
#	mm	Retai	Retained (g)		Min.	Max.
6"	150.0	0.0	Ind. Wt.	100%	-	
3"	75.0	0.0	Ind. Wt.	100%	-	
2"	50.0	0.0	Ind. Wt.	100%		(m)
1.5"	37.5	459.8	Ind. Wt.	97%		
1.0	25.0	903.9	Ind. Wt.	92%		-
3/4"	19.0	327.1	Ind. Wt.	89%	-	
1/2"	12.5	15.7	Cum. Wt.	87%	3	
3/8"	9.5	26.7	Cum. Wt.	86%	-	
#4	4.75	53.8	Cum. Wt.	82%	÷	+
#8	2.36	73.9	Cum. Wt.	79%	-	-
#10	2.00	79.7	Cum. Wt.	78%		-
#16	1.180	96.0	Cum. Wt.	76%	-	-
#30	0.600	123.1	Cum. Wt.	72%	. +	4
#40	0.425	141.2	Cum. Wt.	70%	-	2.1
#50	0.300	160.5	Cum. Wt.	67%	÷	-
#100	0.150	210.4	Cum. Wt.	60%	-	-
#200	0.075	277.0	Cum. Wt.	51%	*	•
Pan 291.4		Cum. Wt.			1	

Moisture of Roc	k		Lic	Pla
Tare #:	21		luid	stici
Tare Wt. (g)	4		Lim	ty Ir
Wet & Tare Wt. (g)	1		it:	ıdex
Dry & Tare Wt. (g)		Sample:	42	18
Moisture (%):		Specification:		-

Washed By: LAB

Gradation Tested By: LAb

Split Sieve (mm):	19.00	
	Wet	Dry
Wt. Retained (g):	1691	1691
Wt. Passing (g):	15495	14397
Total Sample Wt. (g):	17186	16087

	Wash:	Moisture:
Tare #:	-	-
Tare Wt. (g):	533.0	243.4
Wet & Tare Wt. (g):	1228.4	876.8
Dry & Tare Wt. (g):		831.9
Dry Weight (g):	646.1	588.5
Moisture (%):	7.63%	7.63%
Post Wash & TareWt. (g):	824.5	









LAB.GDT GINT US GPJ LAKE WARD | 594-0009 5 SIZE GRAIN

8/10/20

	Huddles 2789 Ri Grand J 970, 255	ton-Berry Engine verside Parkway unction, CO 8150	ering & 7	Festing, [LC		ATTERBERG	G LIMITS' RESUL
CLIE	970-255	2					PROJECT NAME Ward lake	
PRC	JECT NUMBER	01594-0009				_	PROJECT LOCATION Mesa County, Co	olorado
	50					CL	CH	
PLAST - C	40							
I T Y	30							
	10				/	/		
	0 0	20	_		40	ML	MH 60 80	100
S	specimen Ider	tification	LL	PL	PI	#200	QUID LIMIT Classification	
2	0-0546	8/6/2020	33	21	12	56	SANDY LEAN CLAY(CL)	
			_	_				





GRAIN SIZE 01594-0009 WARD LAKE GPJ GINT US LAB GDT

8/10/20

H	Huddlest 2789 Riv Grand Ju 970-255-	on-Berry Engined verside Parkway inction, CO 8150 8005	ering & T	esting, L	LC			A	TTER	BERG	G LIMI	rs' re	ESUL
CLIENT	Con-Sy, Inc.			_			PROJEC		ard lake			_	
PROJE		01594-0009		1			PROJEC	LOCATIO	N Mesa C	ounty, Co	lorado	12	_
P	50					CL	CH			/	/		_
	40												
TY INDEX	20					/							
	O O	20			40	ML	MH 60 LIQUID LIMIT		80		1	00	
Spe	ecimen Iden	tification	LL	PL	PI ;	#200	Classificati	on					



Project No.: 01594 - 0009

Project Name: Ward Lake Reconstruction

Client Name: Con-Sy Inc.

Placement Contractor: Con-Sy Inc

Contractor Representative:

Wayne Balderston

No.	Test Location / Observation Area	Elevation (ft)*	Lab No.	Max. Dry Density (pcf)	Optimum Moisture (%)	Number of Passes / Dry Density (pcf)	Moisture Content (%)	Relative Comp. (%)	Meets Spec.	Remarks Deflection / Pumping Noted
1	Center Most Section of Dam Sta. ~ 0+80 to 1+20 and 2+80 and 3+	-20 ~10127	20-0576	109.1	16.7	106.8	18.2	98	Y	
2	Center Most Section of Dam Sta. ~ 0+80 to 1+20 and 2+80 and 3+	-20 ~10128. 5	20-0576	109.1	16.7	107.9	18.6	99	Y	
3	Center Most Section of Dam Sta. ~ 0+80 to 1+20 and 2+80 and 3+	-20 ~10129	20-0576	109.1	16.7	106.6	18.7	98	Y	
Com	paction / Proof Equipment: sheeps foo	t				Remarks:	10% rock	correction,	Locatio	ns and Elevations are approximate
Μ	Material Type: native Minimum Density:					97 %	Within -	2 and +	2 %	of Optimum Moisture Content
Gauge	Number: <u>12122</u> D	ensity Counts: 14	18		Μ	loisture Cou	nts: <u>522</u>			Record No. 23 S

Tested By: JAL	Date: 10/23/20
Work Order No:	69708
Authorized By: Client	Date: 10/23/20
Reviewed By: JAL	Date: 10/23/20



Project No.: 01594 - 0009

Project Name: Ward Lake Reconstruction

Client Name: Con-Sy Inc.

Gauge Number: 12122

Placement Contractor: Con-Sy Inc

Contractor Representative:

Wayne Balderston

Density Counts: 1418

SOIL	COMPA	CTION	TEST	REPOR	Γ

Tested By: Dm	Date: 10/22/20
Work Order No:	69657
Authorized By: Client	Date: 10/22/20
Reviewed By: JAL	Date: 10/23/20

No.	Test Location / Observation Area	Elevation (ft)*	Lab No.	Max. Dry Density (pcf)	Optimum Moisture (%)	Number of Passes / Dry Density (pcf)	Moisture Content (%)	Relative Comp. (%)	Meets Spec.	Remarks Deflection / Pumping Noted	
1	Center Most Section of Dam Sta. ~ 0+80 to 1+20 and 2+80 and 3+20	~10126	20-0576	109.1	16.7	108.3	18.4	99	Y	16% RC	
Com	paction / Proof Equipment: sheeps foot					Remarks: 10% rock correction, Locations and Elevations are approximate					
Μ	aterial Type: native		Mini	mum Dens	ity:	97 %	Within -	2 and +	2 %	of Optimum Moisture Content	

Moisture Counts: 522



Task: dam

Project No.: 01594 - 0009

Project Name: Ward Lake Reconstruction

Client Name: Con-Sy Inc.

Placement Contractor: Con-Sy Inc

Work Order No: 69627 Authorized By: Client **Date:** 10/21/20 Reviewed By: JAL Date: 10/22/20

	SOIL COMPACTION TEST REPORT	
backfill		

Tested By: Dm

Date: 10/21/20

Contra	Contractor Representative: Wayne Balderston									
No.	Test Location / Observation Area	Elevation (ft)*	Lab No.	Max. Dry Density (pcf)	Optimum Moisture (%)	Number of Passes / Dry Density (pcf)	Moisture Content (%)	Relative Comp. (%)	Meets Spec.	Remarks Deflection / Pumping Noted
1	Center Most Section of Dam Sta. ~ 0+80 to 1+20 and 2+80 and 3+20	~10123	20-0576	109.1	16.7	107.2	17.4	98	Y	16% RC
2	Center Most Section of Dam Sta. ~ 0+80 to 1+20 and 2+80 and 3+20	~10124	20-0576	109.1	16.7	107.9	17.8	99	Y	16% RC
3	Center Most Section of Dam Sta. ~ 0+80 to 1+20 and 2+80 and 3+20	~10125	20-0576	109.1	16.7	108.6	18.3	100	Y	16% Rc
Com	Compaction / Proof Equipment: sheeps foot						10% rock	correction,	Locatio	ns and Elevations are approximate
Μ	Iaterial Type: native		Mini	mum Dens	ity:	97 %	Within -	2 and +	2 %	of Optimum Moisture Content
Gauge	Number: 12122 Density C	Counts: 142	21		M	loisture Cou	nts: 524			Record No. 21 21 S



Project No.: 01594 - 0009

Project Name: Ward Lake Reconstruction

Wayne Balderston

Client Name: Con-Sy Inc.

Placement Contractor: Con-Sy Inc

Contractor Representative:

Tested By: KC **Date:** 10/20/20

- · · · · · · - · J · <u>· · · · · · · · · · · · · · · · </u>	
Work Order No:	69610
Authorized By: Client	Date: 10/20/20
Reviewed By: JAL	Date: 10/21/20

No.	Test Location / Observation Area	Elevation (ft)*	Lab No.	Max. Dry Density (pcf)	Optimum Moisture (%)	Number of Passes / Dry Density (pcf)	Moisture Content (%)	Relative Comp. (%)	Meets Spec.	Remarks Deflection / Pumping Noted
1	Center Most Section of Dam Sta. ~ 0+80 to 1+20 and 2+80 and 3+20	~10121	20-0576	109.1	16.7	108.7	17.1	100	Y	16% RC
2	Center Most Section of Dam Sta. ~ 0+80 to 1+20 and 2+80 and 3+20	~10122	20-0576	109.1	16.7	107.5	15.7	99	Y	16% RC
Com	paction / Proof Equipment: sheeps foot					Remarks:	10% rock	correction,	Locatio	ns and Elevations are approximate
Μ	Iaterial Type: native		Mini	mum Dens	ity:	97 %	Within -	2 and +	2 %	of Optimum Moisture Content
Gauge	Number: 15541 Density	Counts: 17	70		Μ	loisture Cou	nts: 661			Record No. 20 S



Project No.: 01594 - 0009

Project Name: Ward Lake Reconstruction

Client Name: Con-Sy Inc.

Placement Contractor: Con-Sy Inc

Contractor Representative:

Material Type:

Gauge Number: 12122

Wayne Balderston

native

Density Counts: 1418

No.	Test Location / Observation Area	Elevation (ft)*	Lab No.	Max. Dry Density (pcf)	Optimum Moisture (%)	Number of Passes / Dry Density (pcf)	Moisture Content (%)	Relative Comp. (%)	Meets Spec.	Remarks Deflection / Pumping Noted
1	Center Most Section of Dam Sta. ~ 0+80 to 1+20 and 2+80 and 3+20	~10118	20-0576	109.1	16.7	108.1	18.4	99	Y	16% RC
2	Center Most Section of Dam Sta. ~ 0+80 to 1+20 and 2+80 and 3+20	~10118. 5	20-0576	109.1	16.7	108.0	18.1	99	Y	16% RC
3	Center Most Section of Dam Sta. ~ 0+80 to 1+20 and 2+80 and 3+20	~10119	20-0576	109.1	16.7	107.5	18.3	99	Y	16% Rc
Com	Compaction / Proof Equipment: sheeps foot Remarks: 10% rock correction, Locations and Elevations are approximate									

Minimum Density:

Moisture Counts: 521

SOIL COMPACTION TEST REPORT

Tested By: Dm	Date: 10/16/20	
Work Order No:	69531	
Authorized By: Client	Date: 10/16/20	
Reviewed By: JAL	Date: 10/19/20	

97 % Within - 2 and + 2 % of Optimum Moisture Content



Project No.: 01594 - 0009 Project Name: Ward Lake Reconstruction

Client Name: Con-Sy Inc.

Placement Contractor: Con-Sy Inc

Contractor Representative:

Wayne Balderston

SOIL	COMPA	CTION	TEST	REPORT
------	-------	-------	------	--------

Tested By: Dm	Date: 10/15/20
Work Order No:	69501
Authorized By: Client	Date: 10/15/20
Reviewed By: JAL	Date: 10/16/20

No.	Test Location / Observation Area	Elevation (ft)*	Lab No.	Max. Dry Density (pcf)	Optimum Moisture (%)	Number of Passes / Dry Density (pcf)	Moisture Content (%)	Relative Comp. (%)	Meets Spec.	Remarks Deflection / Pumping Noted
1	Center Most Section of Dam Sta. ~ 0+80 to 1+20 and 2+80 and 3+20	~10117. 5	20-0576	106.2	17.8	108.3	18.8	100+	Y	
Compaction / Proof Equipment: sheeps foot Remarks: 10% rock correction, Locations and Elev.							ns and Elevations are approximate			
Μ	laterial Type: native		Mini	mum Dens	ity:	97 %	Within -	2 and +	2 %	of Optimum Moisture Content



Project No.: 01594 - 0009

Project Name: Ward Lake Reconstruction

Client Name: Con-Sy Inc.

Placement Contractor: Con-Sy Inc

Contractor Representative:

Wayne Balderston

SOIL COMPA	CTION 1	[EST R]	EPORT

Tested By: Dm	Date: 10/14/20
Work Order No:	69491
Authorized By: Client	Date: 10/14/20
Reviewed By: JAL	Date: 10/15/20

No.	Test Location / Observati	ion Area	Elevation (ft)*	Lab No.	Max. Dry Density (pcf)	Optimum Moisture (%)	Number of Passes / Dry Density (pcf)	Moisture Content (%)	Relative Comp. (%)	Meets Spec.	Remarks Deflection / Pumping Noted
1	Center Most Section of Sta. ~ 0+80 to 1+20 and 2+80	Dam 0 and 3+20	~10117	20-0576	106.2	17.8	108.3	17.9	100+	Y	
Com	paction / Proof Equipment: she	eeps foot					Remarks:	10% rock	correction,	Locatio	ns and Elevations are approximate
Μ	laterial Type:	native		Mini	mum Dens	ity:	97 %	Within -	2 and +	2 %	of Optimum Moisture Content
Gauge 1	Number: 12122	Density C	ounts: 140)5		Μ	loisture Cou	nts: 518			Record No. 17 17 S



Project No.: 01594 - 0009 Project Name: Ward Lake Reconstruction

Wayne Balderston

Client Name: Con-Sy Inc.

Placement Contractor: Con-Sy Inc

Contractor Representative:

......

Tested By: Dm	Date: 10/13/20
Work Order No:	69460
Authorized By: Client	Date: 10/13/20
Reviewed By: JAL	Date: 10/14/20

SOIL COMPACTION TEST REPORT

No.	Test Location / Obser	vation Area	Elevation (ft)*	Lab No.	Max. Dry Density (pcf)	Optimum Moisture (%)	Number of Passes / Dry Density (pcf)	Moisture Content (%)	Relative Comp. (%)	Meets Spec.	Remarks Deflection / Pumping Noted
1	Center Most Section Sta. ~ 0+80 to 1+20 and 2	n of Dam 2+80 and 3+20	~10116. 5	20-0576	106.2	17.8	108.4	18.1	100+	Y	
Com	paction / Proof Equipment:	sheeps foot					Remarks:	10% rock	correction,	Locatio	ns and Elevations are approximate
Μ	laterial Type:	native		Mini	mum Dens	ity:	97 %	Within -	2 and +	2 %	of Optimum Moisture Content
Gauge	Number: 12122	Density C	ounts: 141	12		Μ	loisture Cou	nts: 518			Record No. 16 S

Record No. 16 S



Project No.: 01594 - 0009

Project Name: Ward Lake Reconstruction

Client Name: Con-Sy Inc.

Placement Contractor: Con-Sy Inc

Contractor Representative:

Wayne Balderston

SOIL COMPACTION	TEST REPORT
 Tostad By: Dm	Data: $10/12/20$

Tested By: Dm	Date: 10	J/12/20
Work Order No:		69428
Authorized By: Client	Date: 10	0/12/20
Reviewed By: JAL	Date: 10	0/13/20

No.	Test Location / Obser	vation Area	Elevation (ft)*	Lab No.	Max. Dry Density (pcf)	Optimum Moisture (%)	Number of Passes / Dry Density (pcf)	Moisture Content (%)	Relative Comp. (%)	Meets Spec.	Remarks Deflection / Pumping Noted
1	Center Most Section Sta. ~ 0+80 to 1+20 and 2	n of Dam 2+80 and 3+20	~10115	20-0576	106.2	17.8	107.8	17.8	100+	Y	
2	Center Most Section Sta. ~ 0+80 to 1+20 and 2	n of Dam 2+80 and 3+20	~10116	20-0576	106.2	17.8	109.4	18.0	100+	Y	
Com	paction / Proof Equipment:	sheeps foot					Remarks:	10% rock	correction,	Locatio	ns and Elevations are approximate
Μ	aterial Type:	native		Mini	mum Dens	ity:	97 %	Within -	2 and +	2 %	of Optimum Moisture Content
Gauge	Number: 12122	Density C	ounts: 141	12		Μ	loisture Cou	nts: 518			Record No. 15 S



Project No.: 01594 - 0009

Project Name: Ward Lake Reconstruction

Wayne Balderston

Client Name: Con-Sy Inc.

Placement Contractor: Con-Sy Inc

Contractor Representative:

Tested By: Dm	Date: 10/8/20
Work Order No:	69387
Authorized By: Client	Date: 10/8/20
Reviewed By: JAL	Date: 10/9/20

No.	Test Location / Observation Area	Elevation (ft)*	Lab No.	Max. Dry Density (pcf)	Optimum Moisture (%)	Number of Passes / Dry Density (pcf)	Moisture Content (%)	Relative Comp. (%)	Meets Spec.	Remarks Deflection / Pumping Noted		
1	Center Most Section of Dam Sta. ~ 0+80 to 1+20 and 2+80 and 3+20	~10113. 5	20-0576	106.2	17.8	108.5	18.6	100+	Y			
2	Center Most Section of Dam Sta. ~ 0+80 to 1+20 and 2+80 and 3+20	~10114. 5	20-0576	106.2	17.8	108.7	18.2	100+	Y			
Com	Compaction / Proof Equipment: sheeps foot					Remarks:	10% rock	correction,	Locatio	ns and Elevations are approximate		
Μ	Material Type: native Minimum Density:						97 % Within - 2 and + 2 % of Optimum Moisture Content					



Project No.: 01594 - 0009

Project Name: Ward Lake Reconstruction

Client Name: Con-Sy Inc.

Placement Contractor: Con-Sy Inc

Contractor Representative:

Wayne Balderston

SOIL COMPACTION	TEST REPORT

Tested By: JAL	Date: 10/7/20
Work Order No:	26364
Authorized By: Client	Date: 10/7/20
Reviewed By: JAL	Date: 10/8/20

No.	Test Location / Observation Area	Elevation (ft)*	Lab No.	Max. Dry Density (pcf)	Optimum Moisture (%)	Number of Passes / Dry Density (pcf)	Moisture Content (%)	Relative Comp. (%)	Meets Spec.	Remarks Deflection / Pumping Noted
1	Center Most Section of Dam Sta. ~ 0+80 to 1+20 and 2+80 and 3+20	~10113	20-0576	106.2	17.8	106.2	17.8	100	Y	Elevation 10111
2	Center Most Section of Dam Sta. ~ 0+80 to 1+20 and 2+80 and 3+20	~10112	20-0576	106.2	17.8	106.1	17.2	100	Y	Elevation 10112
3	Center Most Section of Dam Sta. ~ 0+80 to 1+20 and 2+80 and 3+20	~10111	20-0576	106.2	17.8	106.2	18.2	100	Y	Elevation 10113
										Elevations above by Dowl
Com	paction / Proof Equipment: sheeps foot					Remarks:	10% rock	correction,	Locatio	ns and Elevations are approximate
Μ	laterial Type: native		Mini	mum Dens	ity:	97 %	Within -	2 and +	2 %	of Optimum Moisture Content
Gauge	Number: 12122 Density	Counts: 14	16		Μ	loisture Cou	nts: 622			Record No. 13 13 S



Project No.: 01594 - 0009

Wayne Balderston

Project Name: Ward Lake Reconstruction

Client Name: Con-Sy Inc.

Placement Contractor: Con-Sy Inc

Contractor Representative:

Tested Rv. IAI Date: 10/6/20

I CSICU Dy. JAL	Date: 10/0/20	
Work Order No:	69323	
Authorized By: Client	Date: 10/6/20	
Reviewed By: JAL	Date: 10/7/20	

No.	Test Location / Observ	vation Area	Elevation (ft)*	Lab No.	Max. Dry Density (pcf)	Optimum Moisture (%)	Number of Passes / Dry Density (pcf)	Moisture Content (%)	Relative Comp. (%)	Meets Spec.	Remarks Deflection / Pumping Noted
1	Center Most Section Sta. ~ 0+80 to 1+20 and 2	n of Dam 2+80 and 3+20	~10110	20-0576	106.2	17.8	105.3	17.8	99	Y	
Com	paction / Proof Equipment:	sheeps foot					Remarks:	10% rock	correction,	Locatio	ns and Elevations are approximate
Μ	laterial Type:	native		Mini	mum Dens	ity:	97 %	Within -	2 and +	2 %	of Optimum Moisture Content
Gauge	auge Number: 12122 Density Counts: 1416 Moisture Counts: 622 Record No. 12 12 S										



Project No.: 01594 - 0009

Project Name: Ward Lake Reconstruction

Wayne Balderston

Density Counts: 1416

Client Name: Con-Sy Inc.

Gauge Number: 12122

Placement Contractor: Con-Sy Inc

Contractor Representative:

SOIL COMPACTION TEST REPORT

Tested By: JAL	Date: 10/5/20
Work Order No:	69285
Authorized By: Client	Date: 10/5/20
Reviewed By: JAL	Date: 10/6/20

No.	Test Location / Observation Area	Elevation (ft)*	Lab No.	Max. Dry Density (pcf)	Optimum Moisture (%)	Number of Passes / Dry Density (pcf)	Moisture Content (%)	Relative Comp. (%)	Meets Spec.	Remarks Deflection / Pumping Noted
1	Center Most Section of Dam Sta. ~ 0+80 to 1+20 and 2+80 and 3+20	~10108	20-0576	106.2	17.8	105.8	18.5	100	Y	
2	Center Most Section of Dam Sta. ~ 0+80 to 1+20 and 2+80 and 3+20	~10109	20-0576	106.2	17.8	106.2	17.2	100	Y	
Compaction / Proof Equipment: sheeps foot						Remarks:	10% rock	correction,	Locatio	ns and Elevations are approximate
Μ	aterial Type: native		Mini	mum Dens	ity:	97 %	Within -	2 and +	2 %	of Optimum Moisture Content

Moisture Counts: 622



dam backfill

Project No.: 01594 - 0009

Project Name: Ward Lake Reconstruction

Client Name: Con-Sy Inc.

Gauge Number: 12122

Placement Contractor: Con-Sy Inc

Contractor Representative:

Wayne Balderston

Density Counts: 1416

Task:dam backfill			
	Tested By: JAL	Date: 10/1/20	
	Work Order No:	69226	
	Authorized By: Client	Date: 10/1/20	
	Reviewed By: JAL	Date: 10/2/20	

No.	Test Location / Observation Area	Elevation (ft)*	Lab No.	Max. Dry Density (pcf)	Optimum Moisture (%)	Number of Passes / Dry Density (pcf)	Moisture Content (%)	Relative Comp. (%)	Meets Spec.	Remarks Deflection / Pumping Noted	
1	Center Most Section of Dam Sta. ~ 0+80 to 1+20 and 2+80 and 3+20	~10106	20-0576	106.2	17.8	104.8	18.2	99	Y	Record 9 retest 1	
2	Center Most Section of Dam Sta. ~ 0+80 to 1+20 and 2+80 and 3+20	~10107	20-0576	106.2	17.8	106.2	17.8	100	Y	Record 9 retest 2	
Com	paction / Proof Equipment: sheeps foot					Remarks: 10% rock correction, Locations and Elevations are approximate					
Μ	aterial Type: native		Mini	num Dens	ity:	97 %	Within -	2 and +	2 %	of Optimum Moisture Content	

Moisture Counts: 622

SOIL COMPACTION TEST REPORT

Record No. 10

S



Project No.: 01594 - 0009

Project Name: Ward Lake Reconstruction

Client Name: Con-Sy Inc.

Placement Contractor: Con-Sy Inc

Contractor Representative:

Wayne Balderston

m backfill			
	Tested Bv• Dm	Date: 9/29/20	

resteu by. Dill	Date. 9/29/20
Work Order No:	69117
Authorized By: Client	Date: 9/29/20
Reviewed By: JAL	Date: 9/30/20

No.	Test Location / Obser	vation Area	Elevation (ft)*	Lab No.	Max. Dry Density (pcf)	Optimum Moisture (%)	Number of Passes / Dry Density (pcf)	Moisture Content (%)	Relative Comp. (%)	Meets Spec.	Remarks Deflection / Pumping Noted
1	Center Most Section Sta. ~ 0+80 to 1+20 and 2	n of Dam 2+80 and 3+20	~10106	20-0576	106.2	17.8	98.6	15.3	93	Ν	
2	Center Most Section Sta. ~ 0+80 to 1+20 and 2	n of Dam 2+80 and 3+20	~10107	20-0576	106.2	17.8	98.8	15.9	93	N	
Com	paction / Proof Equipment:	sheeps foot					Remarks:	10% rock	correction,	Locatio	ns and Elevations are approximate
Μ	laterial Type:	native		Mini	mum Dens	ity:	97 %	Within -	2 and +	2 %	of Optimum Moisture Content
Gauge	uge Number: 12122 Density Counts: 1416 Moisture Counts: 622 Record No. 9 9 S										



Project No.: 01594 - 0009 **Project Name:** Ward Lake Reconstruction

Client Name: Con-Sy Inc.

Placement Contractor: Con-Sy Inc

Contractor Representative: Wayne Balde

No.

1

2

3

4

Representative: wayne Baldersto	n	-							
Test Location / Observation Area	Elevation (ft)*	Lab No.	Max. Dry Density (pcf)	Optimum Moisture (%)	Number of Passes / Dry Density (pcf)	Moisture Content (%)	Relative Comp. (%)	Meets Spec.	Remarks Deflection / Pumping Noted
Center Most Section of Dam Sta. ~ 0+80 to 1+20 and 2+80 and 3+20	~10104. 5	20-0576	105.3	18.1	105.1	17.8	100	Y	2.5' below top of inlet structure
Center Most Section of Dam Sta. ~ 0+80 to 1+20 and 2+80 and 3+20	~10104. 5	20-0576	105.3	18.1	104.5	17.6	99	Y	2.5' below top of inlet structure
Center Most Section of Dam Sta. ~ 0+80 to 1+20 and 2+80 and 3+20	~10105. 5	20-0576	105.3	18.1	104.7	18.9	99	Y	2.5' below top of inlet structure
Center Most Section of Dam Sta. ~ 0+80 to 1+20 and 2+80 and 3+20	~10105. 5	20-0576	105.3	18.1	104.8	18.1	100	Y	2.5' below top of inlet structure

Tested By: KC	Date: <u>9/24/20</u>
Work Order No:	69046
Authorized By: Client	Date: 9/24/20
Reviewed By: JAL	Date: 9/25/20

Compaction / Proof Equipm	ent: sheeps foot		Remarks:	10% rock c	correction,	Locations an	d Elevations are approximate		
Material Type:	native	Minimum Density	97 %	Within -	2 and +	2 % of Op	otimum Moisture Content		
Gauge Number: 15541	Density C	ounts: <u>1766</u>	Moisture Cou	ints: <u>667</u>			Record No.	8	8 S



Task:Dam Backfill

Project No.: 01594 - 0009 Project Name: Ward Lake Reconstruction

Client Name: Con-Sy Inc.

Placement Contractor: Con-Sy Inc

Contractor Representative:

Gauge Number: 15541

Wayne Balderston

Density Counts: 1774

SOIL	COMPA	CTION	TEST	REPO	RT

Tested By: KC	Date: 9/23/20
Work Order No:	69011
Authorized By: Client	Date: 9/23/20
Reviewed By: JAL	Date: 9/24/20

No.	Test Location / Observation Area	Elevation (ft)*	Lab No.	Max. Dry Density (pcf)	Optimum Moisture (%)	Number of Passes / Dry Density (pcf)	Moisture Content (%)	Relative Comp. (%)	Meets Spec.	Remarks Deflection / Pumping Noted
1	Inlet Structure - north side	~10103. 5	20-0576	105.3	18.1	104.5	19.1	99	Y	elevations based off of top of inlet structure concrete
2	Inlet Structure - east side	~10103	20-0576	105.3	18.1	102.7	19.6	98	Y	
3	Inlet Structure - south side	~10102. 5	20-0576	105.3	18.1	103.1	20.0	98	Y	
4	Center Most Section of Dam Sta. ~ 0+80 to 1+20 and 2+80 and 3+20	~10102. 5	20-0576	105.3	18.1	103.6	19.6	98	Y	
5	center of east side of outlet structure	~10102. 5	20-0576	105.3	18.1	102.3	20.0	97	Y	
Com	paction / Proof Equipment: Walk Behind Shee	ps Foot / I	Loaded	Haul Truck	-	Remarks:	10% rock (correction,	Locatio	ns and Elevations are approximate
Μ	aterial Type: native	ity:	97 %	Within -	2 and +	2 %	of Optimum Moisture Content			

Moisture Counts: 667

Record No. 7 7 S



Task:Dam Backfill

Project No.: 01594 - 0009 Project Name: Ward Lake Reconstruction

Wayne Balderston

Client Name: Con-Sy Inc.

Placement Contractor: Con-Sy Inc

Contractor Representative:

Tested By: CDR	Date: 9/22/20
Work Order No:	68982
Authorized By: Client	Date: 9/22/20
Reviewed By: JAL	Date: 9/23/20

No.	Test Location / Observation Area	Elevation (ft)*	Lab No.	Max. Dry Density (pcf)	Optimum Moisture (%)	Number of Passes / Dry Density (pcf)	Moisture Content (%)	Relative Comp. (%)	Meets Spec.	Remarks Deflection / Pumping Noted
1	Inlet Structure - South Side	-6.0	20-0576	106.2	17.8	103.0	17.1	97	Y	
2	Inlet Structure - North Side	-6.5	20-0576	106.2	17.8	103.2	17.3	97	Y	
3	South Side of Outlet Pipe Encasement - Sta: 0+90) See Remarks	20-0576	106.2	17.8	108.9	17.2	100+	Y	Plan Elevation level 10102
4	South Side of Outlet Pipe Encasement - Sta: 0+60) See Remarks	20-0576	106.2	17.8	108.3	19.0	100+	Y	Plan Elevation level 10102
5	North Side of Outlet Pipe Encasement - Sta: 1+40) See Remarks	20-0576	106.2	17.8	108.4	16.1	100+	Y	Plan Elevation level 10102
6	North Side of Outlet Pipe Encasement - Sta: 0+80) See Remarks	20-0576	106.2	17.8	104.8	18.2	99	Y	Plan Elevation level 10102
Con	paction / Proof Equipment: Walk Behind She	eps Foot / I	Loaded	Haul Truck		Remarks:	10% rock	correction.	Locatio	ns and Elevations are approximate
N	Iaterial Type: native	T	Mini	mum Dens	ity:	97 %	Within -	2 and +	2 %	of Optimum Moisture Content
Gauge	Number: 17410 Density (Counts: 168	33		. · ·	loisture Cou	nts: 617			Record No. 6 6 S



Project No.: 01594 - 0009 Ward Lake Reconstruction

Wayne Balderston

Density Counts: 1416

Project Name:

Client Name: Con-Sy Inc.

Placement Contractor: Con-Sy Inc

Contractor Representative:

Gauge Number: 12122

SOIL COMPACTION TEST REPORT

Tested By: Dm	Date: 9/17/20
Work Order No:	68890
Authorized By: Client	Date: 9/17/20
Reviewed By: JAL	Date: 9/18/20

No.	Test Location / Observation Area	Elevation (ft)*	Lab No.	Max. Dry Density (pcf)	Optimum Moisture (%)	Number of Passes / Dry Density (pcf)	Moisture Content (%)	Relative Comp. (%)	Meets Spec.	Remarks Deflection / Pumping Noted
1	Center Most Section of Dam Sta. ~ 0+80 to 1+20 and 2+80 and 3+20	~10101. 5	20-0576	106.2	17.8	106.1	17.2	100	Y	Top of pipe encasement
2	Center Most Section of Dam Sta. ~ 0+80 to 1+20 and 2+80 and 3+20	~10101. 5	20-0576	106.2	17.8	105.4	17.6	99	Y	Top of pipe encasement
3	Center Most Section of Dam Sta. ~ 0+80 to 1+20 and 2+80 and 3+20	~10101. 5	20-0576	106.2	17.8	105.9	17.5	100	Y	Top of pipe encasement
4	Center Most Section of Dam Sta. ~ 0+80 to 1+20 and 2+80 and 3+20	~10101. 5	20-0576	106.2	17.8	105.6	17.5	99	Y	Top of pipe encasement
Compaction / Proof Equipment: sheeps foot Re						Remarks:	10% rock correction, Locations and Elevations are approximate			
Material Type: native			Minimum Density: 97 %				Within - 2 and + 2 % of Optimum Moisture Content			

Moisture Counts: 622


Task: dam backfill

Project No.: 01594 - 0009 Project Name: Ward Lake Reconstruction

Wayne Balderston

Client Name: Con-Sy Inc.

Placement Contractor: Con-Sy Inc

Contractor Representative:

SOIL COMPACTION TEST REPORT

Tested By: KC	Date:	9/16/20
Work Order No:		68865
Authorized By: Client	Date:	9/16/20

Reviewed By: BJR Date: <u>9/18/2</u>0

No.	Test Location / Observation Area	Elevation (ft)*	Lab No.	Max. Dry Density (pcf)	Optimum Moisture (%)	Number of Passes / Dry Density (pcf)	Moisture Content (%)	Relative Comp. (%)	Meets Spec.	Remarks Deflection / Pumping Noted
1	Center Most Section of Dam Sta. ~ 0+80 to 1+20 and 2+80 and 3+20	Varies	20-0576	106.2	17.8	104.0	19.2	98	Y	2' up side of pipe encasement
2	Center Most Section of Dam Sta. ~ 0+80 to 1+20 and 2+80 and 3+20	Varies	20-0576	106.2	17.8	103.7	18.7	98	Y	2' up side of pipe encasement
3	Center Most Section of Dam Sta. ~ 0+80 to 1+20 and 2+80 and 3+20	Varies	20-0576	106.2	17.8	102.0	18.3	96	Y	2' up side of pipe encasement
4	Center Most Section of Dam Sta. ~ 0+80 to 1+20 and 2+80 and 3+20	Varies	20-0576	106.2	17.8	102.3	19.7	96	Y	2' up side of pipe encasement
Com	paction / Proof Equipment: sheeps foot					Remarks:	10% rock (correction,	Locatio	ns and Elevations are approximate
Μ	aterial Type: native		Mini	num Dens	ity:	97 %	Within -	2 and +	2 %	of Optimum Moisture Content
Gauge	Number: 15541 Density C	Counts: <u>177</u>	79		Μ	loisture Cou	nts: <u>670</u>			Record No 4 S



Task:dam backfill

Project No.: 01594 - 0009 Project Name: Ward Lake Reconstruction

Wayne Balderston

Client Name: Con-Sy Inc.

Placement Contractor: Con-Sy Inc

Contractor Representative:

Tostad Dr. VC

SOIL COMPACTION TEST REPORT

Tested By: KC	Date: <u>9/15/20</u>
Work Order No:	68834
Authorized By: Client	Date: 9/15/20
Reviewed By: BJR	Date: 9/18/20

No.	Test Location / Observation	Area Elevation (ft)*	Lab No.	Max. Dry Density (pcf)	Optimum Moisture (%)	Number of Passes / Dry Density (pcf)	Moisture Content (%)	Relative Comp. (%)	Meets Spec.	Remarks Deflection / Pumping Noted
1	Center Most Section of Da Sta. ~ 0+80 to 1+20 and 2+80 and	am nd 3+20 Varies	20-0576	106.2	17.8	104.2	17.1	98	Y	1' up side of pipe encasement
2	Center Most Section of Da Sta. ~ 0+80 to 1+20 and 2+80 and	am nd 3+20 Varies	20-0576	106.2	17.8	103.2	18.3	97	Y	1' up side of pipe encasement
3	Center Most Section of Da Sta. ~ 0+80 to 1+20 and 2+80 and	am nd 3+20 Varies	20-0576	106.2	17.8	104.2	19.3	98	Y	1' up side of pipe encasement
4	Center Most Section of Da Sta. ~ 0+80 to 1+20 and 2+80 an	am nd 3+20 Varies	20-0576	106.2	17.8	103.7	19.4	98	Y	1' up side of pipe encasement
Com	paction / Proof Equipment: sheep	s foot				Remarks:	10% rock	correction,	Locatio	ns and Elevations are approximate
Μ	aterial Type: nat	tive	Mini	mum Dens	ity:	97 %	Within -	2 and +	2 %	of Optimum Moisture Content
Gauge	Number: 15541	Density Counts: 17	74		M	loisture Cou	nts: 664			Record No. 3 S



Task:dam backfill below pipe elevation

SOIL COMPACTION TEST REPORT

Date: 8/18/20

Date: 8/18/20

Date: 9/18/20

68373

Tested By: JAL

Authorized By: Client

Reviewed By: BJR

Work Order No:

Project No.:	01594	-	0009	
	*** 1 * 1	1		

Project Name: Ward Lake Reconstruction

Client Name: Con-Sy Inc.

Placement Contractor: Con-Sy Inc

Contractor Representative:

Gauge Number: 15541

Wayne Balderston

Density Counts: 1769

No.	Test Location / Observation Area	Elevation (ft)*	Lab No.	Max. Dry Density (pcf)	Optimum Moisture (%)	Number of Passes / Dry Density (pcf)	Moisture Content (%)	Relative Comp. (%)	Meets Spec.	Remarks Deflection / Pumping Noted
1	Center Most Section of Dam Sta. ~ 0+80 to 1+20 and 2+80 and 3+20	Varies	20-0576	106.2	17.8	104.3	18.5	98	Y	Fifth 8" lift
2	Center Most Section of Dam Sta. ~ 0+80 to 1+20 and 2+80 and 3+20	Varies	20-0576	106.2	17.8	107.0	18.0	100+	Y	Fifth 8" lift
3	Center Most Section of Dam Sta. ~ 0+80 to 1+20 and 2+80 and 3+20	Varies	20-0576	106.2	17.8	105.0	18.2	99	Y	Sixth 8" Lift
4	Center Most Section of Dam Sta. ~ 0+80 to 1+20 and 2+80 and 3+20	Varies	20-0576	106.2	17.8	104.1	18.5	98	Y	Sixth 8" Lift
Com	paction / Proof Equipment: sheeps foot					Remarks:	10% rock	correction,	Locatio	ns and Elevations are approximate
Μ	laterial Type: native		Mini	mum Dens	ity:	97 %	Within -	2 and +	2 %	of Optimum Moisture Content

Moisture Counts: 688



Task:dam backfill below pipe elevation

SOIL COMPACTION TEST REPORT

Project No.:	0159	94 -	0009	
	 1 7	1 5		

0000

Project Name: Ward Lake Reconstruction

Client Name: Con-Sy Inc.

Placement Contractor: Con-Sy Inc

Contractor Representative:

Wayne Balderston

No.	Test Location / Observation Area	Elevation (ft)*	Lab No.	Max. Dry Density (pcf)	Optimum Moisture (%)	Number of Passes / Dry Density (pcf)	Moisture Content (%)	Relative Comp. (%)	Meets Spec.	Remarks Deflection / Pumping Noted
1	Center Most Section of Dam Sta. ~ 0+80 to 1+20 and 2+80 and 3+20	Varies	20-0576	106.2	17.8	104.1	18.4	98	Y	first 8" lift
2	Center Most Section of Dam Sta. ~ 0+80 to 1+20 and 2+80 and 3+20	Varies	20-0576	106.2	17.8	103.4	17.2	97	Y	first 8" lift
3	Center Most Section of Dam Sta. ~ 0+80 to 1+20 and 2+80 and 3+20	Varies	20-0576	106.2	17.8	104.3	18.5	98	Y	second 8" lift
4	Center Most Section of Dam Sta. ~ 0+80 to 1+20 and 2+80 and 3+20	Varies	20-0576	106.2	17.8	104.1	18.3	98	Y	second 8" lift
5	Center Most Section of Dam Sta. ~ 0+80 to 1+20 and 2+80 and 3+20	Varies	20-0576	106.2	17.8	103.9	18.3	98	Y	third 8" lift
6	Center Most Section of Dam Sta. ~ 0+80 to 1+20 and 2+80 and 3+20	Varies	20-0576	106.2	17.8	103.9	18.5	98	Y	third 8" lift
7	Center Most Section of Dam Sta. ~ 0+80 to 1+20 and 2+80 and 3+20	Varies	20-0576	106.2	17.8	104.3	17.6	98	Y	fourth 8" lift
8	Center Most Section of Dam Sta. ~ 0+80 to 1+20 and 2+80 and 3+20	Varies	20-0576	106.2	17.8	104.0	18.3	98	Y	fourth 8" lift
Com	Compaction / Proof Equipment: sheeps foot Remarks: 10% rock correction, Locations and Elevations are approximate									
Μ	laterial Type: native		Mini	mum Dens	ity:	97 %	Within -	2 and +	2 %	of Optimum Moisture Content

Record No. 1 S

Tested By: KC	Date: 8/17/20
Work Order No:	68320
Authorized By: Client	Date: 8/17/20
Reviewed By: BJR	Date: 9/18/20



	Та	sk / M	ateria	l Teste	ed:		Inlet S	Structu	ıre						
Project No	D.:	01594	- 000)9					Authorized	d By:	Client	Date	e: 09/1	8/20	
Project Na	ame: Wa	rd Lake	Recons	struction	1				Sampled B	y: -	Dm	_ Date	e: 09/1	8/20	
Client Nar	me: Co	n-Sy Inc	•						- V	Nork O	rder No.	:	68917		
General C	contractor:	Co	n-Sy In	с.					Picked Up	By:	Dm	Date	e: 09/1	9/20	
Placement	t Contracto	or: Co	n-Sy In	с.					Ī	Nork O	rder No.	:			
Contracto	r Represei	ntative:	-		W	Vayne			Reviewed	By:	CDR	Date	e: 10/1	9/20	
Location	of Placen	nent:	inl	et struc	ture e	ast end of	pipe								
Sample I	ocation:	center	of plac	ement											
Cylinder	· Storage]		n•	cincin			30	liacent	to placeme	nt					
Weather	Conditio	ns:	····			sunnv	7	ijucent	to placelik	Ambi	ent Tem	perat	ure (°F):	40s	
					Nu	mber of Sa	mnles Cast	ed/Mo	lded			r			
Concre	ete: 6	*Grou	t Cvl:	0	**Gro	ut Prism:	0 M	ortar C	vi: 0	Mortar	Cube:	0	Soils: ()	
	<u> </u>	Miv Dot	<u></u>				Specificati	one			Maasura	d Pro	portios		
Su	nnlier• Wh	viix Dau nite Wate	<u>a</u> Pr			Temp. C	<u>- Specificati</u> 1064 (deg.	<u>0115</u> F)•	50-90	Temr	C1064	(deg.	$\frac{\text{permes}}{\text{F}} \sim 72$		
Mix I	D/Brand	C18H	<i></i>		•	Shun	$nn_{1004} (ucg.)$	n.)•	4	i emp	Slumn C	(ucg. 143 (ii	$r_{1} = \frac{72}{2}$	•	
Tick	et No.: 416	5120			•	Air Conte	ent. C231 (^o	(h): 6	$\frac{1}{5+/-1.5}$	Air	Cont., C	231 (9	(a): $\frac{2}{5.5}$	•	
B	atch Time	(MIL):		8:54	•		*Flow Ra	nte:			*F	Flow R	ate:	•	
Sar	mple Time	(MIL):		11:10	· τ	U nit Weig ł	nt, C138 (p	cf):	_	Unit	Weight, C	C138 (p	cf): 141.6	•	
W	ater Addeo	d (gal.):		-		Time in	n Mixer (mi	in):	90max	Tin	ne in Mix	er (mi	in): 136	•	
	Load N	umber:	1 of	2		Additional	l Water (ga	l.):			Mo	old Di	ms: 4X8	•	
	Initial W:	C Ratio:	not su	pplied	-	Ma	ax W:C Rat	tio:			Final V	V:C Ra	tio:	•	
	Bat	tch Size:		7 1/2		Compres	sive Str. (p	si):	4500	Avg. (Cap Thick	ness, C	242:	•	
				-											
Tare Volun Soil Weigh	ne (cf): nt (gm):	0.25	Admix	Tare ture We	e Weigh eight (g	nt (lbs): m):	7.60 - Admix	T ature Pe	Tare & Conc	rete We	eight (lbs) Moistur	: re Con	43.00 tent (%):		
Tare Volun Soil Weigh	ne (cf): nt (gm):	0.25	Admix Avg.	Tare	e Weigh eight (g Avg.	nt (lbs): m):	7.60 - Admiz	T ature Pe	are & Conc ercent (%): B	rete We - reak In	eight (lbs) Moistur formatio	: re Con n, C3 9	43.00 tent (%):	 	
Tare Volun Soil Weigh Sample No	ne (cf): nt (gm): Break Date	0.25 - Age	Admix Avg. Dia.	Tare ture We Avg. Hght.	e Weigh eight (g Avg. Area (in)	nt (lbs): m): Weight	7.60 - Admix Unit Wt.	T ature Pe Can*	Tare & Conc ercent (%): B	rete We	ight (lbs) Moistur formatio rength psi)	: re Con n, C39 (psi) Ratio	43.00 tent (%):		
Tare Volun Soil Weigh Sample No. 20-03036	ne (cf):	0.25 - (days) 3	Admix Avg. Dia. (in.)	Tare ture We Avg. Hght. (in.)	e Weigh eight (g Avg. Area (in.)	nt (lbs): m): Weight (g) 3774	7.60 - Admiz Unit Wt. (pcf)	T kture Pe Cap*	Fare & Conc ercent (%): B Load (lbs) 56440	rete We	ight (lbs) Moistur formatio rength psi)	: re Con n, C3 (psi) Ratio 99%	43.00 tent (%): 9 Break Type 5	Tech.	
Tare Volun Soil Weigh Sample No. 20-03036 20-03037	ne (cf):	0.25 - (days) 3 7	Admix Avg. Dia. (in.)	Tare ture We Avg. Hght. (in.)	e Weigh eight (g Avg. Area (in.)	nt (lbs): m): Weight (g) 3774 3774	7.60 - Admix Unit Wt. (pcf) 142.0 142.0	T ature Pe Cap* U U	Fare & Conc ercent (%): B Load (lbs) 56440 59610	rete We	Moistur formatio rength psi)	: re Con n, C3! (psi) Ratio 99% 05%	43.00 tent (%): Break Type 5 5	Tech.	
Tare Volun Soil Weigh Sample No. 20-03036 20-03037 20-03038	ne (cf):	0.25 - (days) 3 7 7	Admix Avg. Dia. (in.)	Tare ture We Avg. Hght. (in.)	e Weigh eight (g Avg. Area (in.)	nt (lbs): m): Weight (g) 3774 3774 3746	7.60 - Admix Unit Wt. (pcf) 142.0 142.0 140.9	T ature Pe Cap* U U U U	Fare & Conc ercent (%): Load (lbs) 56440 59610 59625	rete We	Moistur formatio rength psi) 1 470 (720 1 720 1	: re Con n, C39 (psi) Ratio 99% 05%	43.00 tent (%): Break Type 5 5 5 5	Tech. DC DC	
Tare Volun Soil Weigh No. 20-03036 20-03037 20-03038 20-03039	ne (cf):	0.25 Age (days) 3 7 7 7 28	Admix Avg. Dia. (in.)	Tare ture Wo Avg. Hght. (in.)	e Weigh eight (g Avg. Area (in.)	nt (lbs): m): Weight (g) 3774 3774 3746 3734	7.60 - Admix Unit Wt. (pcf) 142.0 142.0 140.9 140.5	T cture Pe Cap* U U U U U U	Fare & Conc ercent (%): B Load (lbs) 56440 59610 59625 72300	rete We 	ight (lbs) Moistur formation formation formation formation formation 1 470 1 720 1 720 1 720 1	: re Con (psi) Ratio 99% 05% 05% 27%	43.00 tent (%): Break Type 5 5 5 5 5 5	Tech. DC DC DC DC	
Tare Volun Soil Weigh Sample No. 20-03036 20-03037 20-03038 20-03039 20-03040	ne (cf):	0.25 - (days) 3 7 7 28 28 28	Admix Avg. Dia. (in.)	Tare ture Wo Avg. Hght. (in.)	e Weigh eight (g Avg. Area (in.)	nt (lbs): m): Weight (g) 3774 3774 3774 3774 3774 3774 3764	7.60 - Admix Unit Wt. (pcf) 142.0 142.0 140.9 140.5 141.6	T sture Pe Cap* U U U U U U	Fare & Concercent (%): B Load (lbs) 56440 59610 59625 72300 71540	rete We reak In xtr 4 4 4 5 5 5	ight (lbs) Moistur formation formation <	:	43.00 tent (%): Break Type 5 5 5 5 5 5 5 5	Tech. DC DC DC DC DC	
Tare Volun Soil Weigh Sample No. 20-03036 20-03037 20-03038 20-03039 20-03040 20-03041	ne (cf): nt (gm): Break Date 09/21/20 09/25/20 09/25/20 10/16/20 10/16/20	0.25 Age (days) 3 7 7 28 28 28 28	Admix Avg. Dia. (in.)	Tara iture Wo Avg. Hght. (in.)	e Weigh eight (g Avg. Area (in.)	m):	7.60 - Admix Unit Wt. (pcf) 142.0 142.0 140.9 140.5 141.6 141.7	T cture Pe Cap* U U U U U U U U U	Care & Conc B Load (lbs) 56440 59610 59625 72300 71540 74625	rete We 	ight (lbs) Moistur formatio rength 1 psi) 1 470 1 720 1 720 1 720 1 660 1 910 1	:	43.00 tent (%): Break Type 5 5 5 5 5 5 5 5 5	Tech. DC DC DC DC DC DC	
Tare Volun Soil Weigh No. 20-03036 20-03037 20-03038 20-03039 20-03040 20-03041	ne (cf):	0.25 Age (days) 3 7 7 28 28 28 28	Admix Avg. Dia. (in.)	Tare ture Wo Avg. Hght. (in.)	e Weigh eight (g Avg. Area (in.)	m): Weight (g) 3774 3774 3774 3746 3734 3764 3768	7.60 - Admix Unit Wt. (pcf) 142.0 142.0 140.9 140.5 141.6 141.7	T cture Pee Cap* U U U U U U U U U U U U U	Sare & Conc B Load (lbs) 56440 59610 59625 72300 71540 74625	rete We reak In Str (4 4 4 5 5 5 5	ight (lbs) Moistur formation rength psi) 1 470 1 720 1 720 1 660 1 910 1	: re Con n, C39 (psi) Ratio 99% 05% 05% 05% 27% 26% 31%	43.00 tent (%): Break Type 5 5 5 5 5 5 5 5 5	Tech. DC DC DC DC DC DC	
Tare Volun Soil Weigh No. 20-03036 20-03037 20-03038 20-03039 20-03040 20-03041 20-03042	ne (cf): Break Date 09/21/20 09/25/20 10/16/20 10/16/20 10/16/20 09/25/20	0.25 Age (days) 3 7 28 28 28 28 28 7	Admix Avg. Dia. (in.)	Tare ture Wo Avg. Hght. (in.)	e Weigh eight (g Avg. Area (in.)	nt (lbs): m): Weight (g) 3774 3774 3774 3774 3774 3764 3764 3768 3764	7.60 - Admix Unit Wt. (pcf) 142.0 142.0 140.9 140.5 141.6 141.7 - 141.6	T sture Pee Cap* U U U U U U U U U U U	Fare & Concercent (%): B Load (lbs) 56440 59610 59625 72300 71540 74625 56770	rete We reak In xtr 4 4 4 5 5 5 5 4 4 4 4 4 4 4 4 4 4 4 4 4	ight (lbs) Moistur formation formation <th colspa<="" td=""><td>: re Con n, C39 (psi) Ratio 99% 05% 05% 27% 26% 31% 00%</td><td>43.00 tent (%): Break Type 5 5 5 5 5 5 5 5 5 5 5 5 5</td><td>Tech. DC DC DC DC DC DC DC</td></th>	<td>: re Con n, C39 (psi) Ratio 99% 05% 05% 27% 26% 31% 00%</td> <td>43.00 tent (%): Break Type 5 5 5 5 5 5 5 5 5 5 5 5 5</td> <td>Tech. DC DC DC DC DC DC DC</td>	: re Con n, C39 (psi) Ratio 99% 05% 05% 27% 26% 31% 00%	43.00 tent (%): Break Type 5 5 5 5 5 5 5 5 5 5 5 5 5	Tech. DC DC DC DC DC DC DC
Tare Volun Soil Weigh No. 20-03036 20-03037 20-03038 20-03039 20-03040 20-03041 20-03042	ne (cf): nt (gm): Break Date 09/21/20 09/25/20 09/25/20 10/16/20 10/16/20 10/16/20 09/25/20	0.25 Age (days) 3 7 28 28 28 28 28 28 7 CONC	Admix Dia. (in.) 10 7 RETE	Tara ture Wo Avg. Hght. (in.) 50 %	e Weigh eight (g Avg. Area (in.) ⁶⁹ ⁷¹	nt (lbs): m): Weight (g) 3774 3774 3774 3774 3764 3764 3764 3764	7.60 - Admix Unit Wt. (pcf) 142.0 142.0 140.9 140.5 141.6 141.7 141.6 cable), Cor	T cture Pee Cap* U U U U U U U U es, Gro	Care & Conc B Load (lbs) 56440 59610 59625 72300 71540 74625 56770 put Prisms,	rete We reak In reak In (4 4 4 5 5 5 5 4 or Mor	ight (lbs) Moistur formatio rength 1 psi) 1 470 1 720 1 720 1 720 1 660 1 910 1 500 1 ttar Cube	: re Con n, C3! (psi) Ratio 99% 05% 05% 05% 27% 26% 31% 00% es	43.00 tent (%): Break Type 5 5 5 5 5 5 5 5 5 5	Tech. DC DC DC DC DC DC DC	
Sample No. 20-03036 20-03037 20-03038 20-03040 20-03041 20-03042	ne (cf): nt (gm): Break Date 09/21/20 09/25/20 10/16/20 10/16/20 10/16/20 09/25/20 09/25/20	0.25 Age (days) 3 7 7 28 28 28 28 28 7 CONC 7	Admix Avg. Dia. (in.) 10 4 RETE 4.00	Tare ture Wo Avg. Hght. (in.) 60 8.00	e Weigh eight (g Avg. Area (in.) ⁵⁹ ²¹ CURE 12.57	nt (lbs): m): Weight (g) 3774 3774 3774 3774 3774 3764 3764 3764	7.60 - Admix Unit Wt. (pcf) 142.0 142.0 140.9 140.5 141.6 141.7 141.6 cable), Cor	T cture Pee Cap* U U U U U U U U U U U U U	Fare & Concent B Load (lbs) 56440 59610 59625 72300 71540 74625 56770 put Prisms, 60760	rete We reak In Str 4 4 4 5 5 5 4 0 0 Mor 4	ight (lbs) Moistur formation rength psi 470 1 720 1 720 1 720 1 660 1 910 1 500 1 tar Cube 840	: re Con (psi) Ratio 99% 05% 05% 05% 27% 26% 31% 00% es 08%	43.00 tent (%): 9 Break Type 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	Tech. DC DC DC DC DC DC DC	
Tare Volun Soil Weigh No. 20-03036 20-03037 20-03038 20-03039 20-03040 20-03041 20-03042 20-03043 20-03043	ne (cf): Break Date 09/21/20 09/25/20 10/16/20 10/16/20 09/25/20 09/25/20 09/25/20 09/25/20	0.25 Age (days) 3 7 28 28 28 28 28 7 CONC 7 28	Admix Avg. Dia. (in.) 10. 4.00 4.00 4.01	Tare ture Wo Avg. Hght. (in.) Co. & So FIELD 8.00 8.01	e Weigh eight (g Avg. Area (in.) ^{E9} ²¹ ²¹ ²¹ ²² ^{12.57} ^{12.63}	nt (lbs): m): Weight (g) 3774 3774 3774 3774 3774 3774 3764 3764	7.60 - Admix Unit Wt. (pcf) 142.0 142.0 140.9 140.5 141.6 141.7 141.6 cable), Cor 142.6	T cture Pee Cap* U U U U U U U U U U U U U	Fare & Concent B Load (lbs) 56440 59610 59625 72300 71540 74625 56770 put Prisms, 60760 69285	rete We reak In xtr 4 4 4 5 5 5 5 4 0 0 Mor 4 5 5 5 5 5 5 5 5 5 5 5 5 5	ight (lbs) Moistur formation formation <	: re Con n, C39 (psi) Ratio 99% 05% 05% 27% 26% 31% 00% es 08% 22%	43.00 tent (%): 9 Break Type 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	Tech. DC DC DC DC DC DC DC DC	
Tare Volun Soil Weigh No. 20-03036 20-03037 20-03038 20-03039 20-03040 20-03041 20-03041 20-03042 20-03043 20-03043 20-03044	ne (cf): Break Date 09/21/20 09/25/20 09/25/20 10/16/20 10/16/20 09/25/20 09/25/20 10/16/20 10/16/20	0.25 Age (days) 3 7 28 28 28 28 28 7 CONC 7 28 28 28 28 28 28 28 28 28 28	Admix Avg. Dia. (in.) TO 4 RETE 4.00 4.01 3.99	Tara ture Wo Avg. Hght. (in.) CO SC SC FIELD 8.00 8.01 8.02	e Weigh eight (g Avg. Area (in.) ⁵⁰ ⁷¹ ⁷¹ ⁷¹ ⁷¹ ⁷¹ ⁷² ⁷²	nt (lbs): m): Weight (g) 3774 3774 3774 3774 3774 3764 3764 3768 3764 25 (if appli 3738 3786 3754	7.60 - Admix Unit Wt. (pcf) 142.0 142.0 140.9 140.5 141.6 141.7 141.6 cable), Cor 141.7 142.6 142.6	T cture Pee U U U U U U U U U U U U U U U U U U	Fare & Concent (%): B Load (lbs) 56440 59610 59625 72300 71540 74625 56770 put Prisms, 60760 69285 66120	rete We reak In reak In (4 4 4 5 5 5 6 7 6 7 7 7 7 7 7 7 7 7 7 7 7 7	ight (lbs) Moistur formatio rength psi) 1 470 720 1 720 1 720 1 660 910 1 500 1 tar Cube 840 490 1 290	: re Con n, C3! (psi) Ratio 99% 05% 05% 05% 27% 26% 31% 00% es 00% es 08% 22% 18%	43.00 tent (%): Break Type 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	Tech. DC DC DC DC DC DC DC DC DC	
Sample No. 20-03036 20-03037 20-03038 20-03039 20-03040 20-03041 20-03042 20-03044 20-03045 20-03046	ne (cf): Break Date 09/21/20 09/25/20 09/25/20 10/16/20 10/16/20 09/25/20 09/25/20 09/25/20 09/25/20 09/25/20 09/25/20 10/16/20 10/16/20 10/16/20 10/16/20 10/16/20 10/16/20 09/25/20 09/20000000000	0.25 Age (days) 3 7 7 28 28 28 28 7 CONC 7 28 28 28 28 28 28 28 28 28 28	Admix Avg. Dia. (in.) 10 4 RETE 4.00 4.01 3.99 4.00	Tare ture Wo Avg. Hght. (in.) Co ∞ FIELD 8.00 8.01 8.02 8.00	e Weigh eight (g Avg. Area (in.) ⁵⁰ ²¹ ²¹ ²² ²¹ ²² ²¹ ²³ ²¹ ²³ ²³ ²¹ ²³ ²³ ²³ ²³ ²³ ²³ ²³ ²³	nt (lbs): m): Weight (g) 3774 3774 3774 3774 3764 3764 3764 3764	7.60 - Admix Unit Wt. (pcf) 142.0 142.0 140.9 140.5 141.6 141.7 141.6 141.7 141.7 142.6 142.6 142.6 141.3 141.3	T cture Pee Cap* U U U U U U U U U U U U U	Sare & Concent B Load (lbs) 56440 59610 59625 72300 71540 74625 56770 out Prisms, 60760 69285 66120 64865	rete We reak In Str (4 4 4 5 5 5 6 7 4 0 0 Mor 4 5 5 5 5 5 5 5 5 5 5 5 5 5	ight (lbs) Moistur formatio rength 1 psi) 1 470 1 720 1 720 1 720 1 660 1 910 1 500 1 tar Cubo 840 490 1 290 1 160 1	: re Con (psi) Ratio 99% 05% 05% 05% 27% 26% 31% 00% es 00% es 08% 22% 18% 15%	43.00 tent (%): Break Type 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	Tech. DC DC DC DC DC DC DC DC DC DC DC	
Tare Volun Soil Weigh No. 20-03036 20-03037 20-03038 20-03039 20-03040 20-03041 20-03041 20-03042 20-03043 20-03044 20-03045 20-03045 20-03046 Cap Type Remarks	ne (cf): Break Date 09/21/20 09/25/20 09/25/20 10/16/20 10/16/20 09/25/20 09/25/20 09/25/20 09/25/20 09/25/20 09/25/20 09/25/20 10/16/20 10/16/20 10/16/20 10/16/20 s:	0.25 Age (days) 3 7 28 28 28 28 28 7 CONC 7 28 28 28 28 28 28 28 28 28 28	Admix Avg. Dia. (in.) TO 4 RETE 4 .00 4 .01 3 .99 4 .00 G =	Tare ture Wo Avg. Hght. (in.) Co %	e Weigh eight (g Avg. Area (in.) ⁶⁹ ²¹ ^{12.57} ^{12.63} ^{12.57} ^{12.57} ^m	nt (lbs): m): Weight (g) 3774 3774 3774 3774 3774 3774 3774 377	7.60 - Admix Unit Wt. (pcf) 142.0 142.0 140.9 140.5 141.6 141.7 141.6 141.7 142.6 142.6 141.3 Cement	T sture Pee Cap* U U U U U U U U U U U U U	Fare & Concent (%): B Load (lbs) 56440 59610 59625 72300 71540 74625 56770 put Prisms, 60760 69285 66120 64865 Unbonded	rete We reak In Str (4 4 4 5 5 5 5 5 4 0 Mor 4 5 5 5 5 5 5 5 5 5 5 5 5 5	sight (lbs) Moistur formation rength psi) 1 470 720 1 720 1 720 1 720 1 660 1 910 1 500 1 tar Cubo 840 1 290 160 1 ne	: re Con n, C39 (psi) Ratio 99% 05% 05% 05% 27% 26% 31% 00% es 00% es 08% 22% 18% 15% O=N	43.00 tent (%): Break Type 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	Tech. DC DC DC DC DC DC DC DC DC DC DC DC	
Sample Soil Weigh Soil Weigh 20-03036 20-03037 20-03038 20-03039 20-03040 20-03041 20-03042 20-03044 20-03044 20-03045 20-03046 Cap Type Remarks	ne (cf): Break Date 09/21/20 09/25/20 10/16/20 10/16/20 10/16/20 10/16/20 10/16/20 10/16/20 10/16/20 s: Number:	0.25 Age (days) 3 7 28 28 28 28 28 7 CONC 7 28 28 28 28 28 28 28 28 28 28	Admix Avg. Dia. (in.) 10 4 RETE 4 .00 4 .01 3 .99 4 .00 G = of	Tara ture Wo Avg. Hght. (in.)	e Weigh eight (g Avg. Area (in.) ^E ^{CURE} 12.57 12.63 12.50 12.57 m	nt (lbs): m): Weight (g) 3774 3774 3774 3774 3774 3774 3764 3764	7.60 - Admix Unit Wt. (pcf) 142.0 142.0 140.9 140.5 141.6 141.7 141.6 cable), Cor 141.7 142.6 142.6 141.3 Cement	T cture Pee Cap* U U U U U U U U U U U U U	Sare & Concent (%): B Load (lbs) 56440 59610 59625 72300 71540 74625 56770 out Prisms, 60760 69285 66120 64865 Unbonded	rete We reak In reak In (4 4 4 4 5 5 5 6 7 8 8 8 9 9 9 9 9 9 9 9 9 9 9 9 9	Machine formation	: re Con n, C3! (psi) Ratio 99% 05% 05% 27% 26% 31% 00% 22% 18% 15% 08% 22%	43.00 tent (%): 9 Break Type 5 5 5 5 5 5 5 5 5 5 5 5 5	Tech. DC DC DC DC DC DC DC DC DC DC	
Tare Volun Soil Weigh No. 20-03036 20-03037 20-03038 20-03039 20-03040 20-03041 20-03041 20-03042 20-03044 20-03044 20-03044 20-03045 20-03046 Cap Type ³ Remarks	ne (cf): Break Date 09/21/20 09/25/20 10/16/20 10/16/20 10/16/20 10/16/20 10/16/20 10/16/20 10/16/20 s: Number: le No.:	0.25 Age (days) 3 7 28 28 28 28 28 7 CONC 7 28 28 28 28 28 28 28 28 28 28	Admix Avg. Dia. (in.) TO 4 RETE 4.00 4.01 3.99 4.00 G = of	Tara ture Wo Avg. Hght. (in.) CO S S FIELD 8.00 8.01 8.02 8.00 Gypsu 1	e Weigh eight (g Avg. Area (in.) 50 21 E 12.57 12.63 12.50 12.57 m *Flow **Cu	nt (lbs): m): Weight (g) 3774 3774 3774 3774 3774 3764 3764 3764	7.60 - Admix Unit Wt. (pcf) 142.0 142.0 140.9 140.5 141.6 141.7 141.6 cable), Cor 141.7 142.6 142.6 142.6 141.3 Cement	T cture Pee Cap* U U U U U U U U U U U U U	Concent (%): B Load (lbs) 56440 59610 59625 72300 71540 74625 56770 out Prisms, 60760 69285 66120 64865 Unbonded	rete We reak In ((4 4 4 4 5 5 5 6 7 8 8 9 9 9 9 9 9 9 9 9 9 9 9 9	ight (lbs) Moistur formatio rength psi) 1 470 1 720 1 720 1 720 1 720 1 660 1 910 1 500 1 tar Cube 840 840 1 490 1 290 1 160 1 me Machine Lab Scale 1	: <u>F-50</u> : <u>F-50</u>	43.00 tent (%): 9 Break Type 5 5 5 5 5 5 5 5 5 5 5 5 5	Tech. DC DC DC DC DC DC DC DC DC DC	

7



	Та	sk / M	ateria	l Teste	ed:		outlet	struct	ure					
Project No	0.:	01594	- 000	09					Authorized	d By:	Client	Date	e: 09/1	1/20
Project Na	ame: Wa	rd Lake	Recons	struction	ì				Sampled B	y:	EA	Date	e: 09/1	1/20
Client Na	me: Co	n-Sy Inc							V	Nork C	order No	.:	68755	
General C	Contractor:	Co	n-Sy In	с.					Picked Up	By:	EA	Date	e: 09/1	2/20
Placement	t Contracto	or: Co	n-Sy In	c.					٧	Nork C)rder No	.:	68756	
Contracto	r Represei	ntative:			W	Vayne			Reviewed	By:	CDR	Date	e: 10/1	4/20
Location	of Placen	ient:	ou	tlet stru	cture I	North end	of reservoi	r						
Sample L	location:	center	of plac	ement										
Cylinder	r Storage I	Locatio	n:				ac	ijacent	to placeme	ent	and Tan			40.0
weather	Conditio	ns:			•	sunny		1/8.6		AIID	lent Ten	iperat	ure (r):	408
<u> </u>		*0		0	Nu	mber of Sa	imples Cast	ted/Mo			<u> </u>	0	<u> </u>	_
Concr	ete: <u>5</u>	*Grou	it Cyl:	0	**Gro	out Prism:	<u> </u>	ortar C	yı: 0	Mortar	Cube:	0	Solls: ()
G	<u>I</u>	Mix Dat	<u>a</u>			T 0	Specificati	ions D	5 0.00	T	Measure	ed Pro	<u>perties</u>	
Su	ppher: Wr	nite Wate	er			Temp., C	(1064 (deg.	F):	50-90	Tem	p., C1064	(deg.	F): 69	-
MIX I	D/Brand:	C18H				Siun	np, C143 (1)	n.):	$\frac{4}{5 + (1.5)}$: • : •	Slump, C	2143 (1 2221 (1	n.): $\frac{4 1/2}{5 0}$	-
	et No.: 413	(MIT)-		0.51		Air Conte	nt, U231 (% *Flow Da	/o): <u>6.:</u>	5+/-1.5	Air	· Cont., (231 ('	70): <u> </u>	-
D Sou	mple Time	(MIL);		9:31	. T	Init Waigh	*Flow Ka	(1e:		TIn:4	Weight (C120 (m	ate:	-
	inple Time	(WIIL);		12:44		Time in	11, C138 (p) Miron (m)	(1):	- 00may	Unit	weight, o no in Mir	(p) 61.138 (p	(142.4)	-
vv	L and N	u (gal.):	1 of	-		A dditional	l Water (III	ш); л);	901118	1 11			$\frac{173}{172}$	-
	Luau IN	C Dotion	1 OI	nnliad		Auditional	water (ga	11.):			IVI Einal V	VIQ DI	1115; 4 <u>70</u>	-
		C Kallo:	not su	6		Compros	ix W.C. Ka siyo Str. (n	(10	4500	A 100	rillai v Con Thiol	with Ka	110: 142:	-
	Da	un size.		0		compres	sive but (p	<u> </u>	+500	Avg.		mess, c		-
Tare Volur	ne (cf):	0.25		Tare	e Weigh	nt (lbs):	7.60	Т	are & Conc	rete We	eight (lbs):	43.20	
Tare Volur Soil Weigh	ne (cf):	0.25	Admix	Tare ture We	e Weigh eight (g	nt (lbs): m):	7.60 - Admix	T kture Pe	are & Conc ercent (%):	rete We	eight (lbs Moistu): re Con	43.20	_
Tare Volur Soil Weigh	ne (cf): nt (gm):	0.25	Admix	Tare ture We	e Weigh eight (g	nt (lbs): m):	7.60 - Admix	T xture Pe	are & Conc ercent (%):	rete We	eight (lbs Moistu): re Con	43.20 ttent (%):	
Tare Volur Soil Weigh	ne (cf): nt (gm): Break	0.25 - Age	Admix Avg. Dia.	Tare ature We Avg. Hght.	e Weigh eight (g Avg. Area	nt (lbs): m): Weight	7.60 - Admix Unit Wt.	T ature Pe	are & Conc crcent (%): B	rete We	eight (lbs Moistu nformatio): re Con on, C39	43.20 tent (%):	
Tare Volur Soil Weigh Sample No.	ne (cf): nt (gm): Break Date	0.25 - Age (days)	Admix Avg. Dia. (in.)	Tare ature We Avg. Hght. (in.)	e Weigh eight (g Avg. Area (in.)	nt (lbs): m): Weight (g)	7.60 - Admiz Unit Wt. (pcf)	T kture Pe Cap*	are & Conc crcent (%): B Load (lbs)	rete We	eight (lbs Moistu nformatio rength (psi)): re Con on, C3 (psi) Ratio	43.20 ttent (%): 9 Break Type	 Tech.
Tare Volur Soil Weigh Sample No. 20-02991	ne (cf):	0.25 - Age (days) 7	Admix Avg. Dia. (in.)	Tare ture We Avg. Hght. (in.)	e Weigh eight (g Avg. Area (in.)	nt (lbs): m): Weight (g) 3776	7.60 - Admix Unit Wt. (pcf) 143.1	T kture Pe <u>Cap*</u> U	Care & Conc ercent (%): B Load (lbs) 59985	rete We	eight (lbs Moistu nformatio rength (psi)): re Con on, C3 (psi) Ratio	43.20 tent (%): 9 Break Type 3	- Tech. DC
Tare Volur Soil Weigh Sample No. 20-02991 20-02992	ne (cf):	0.25 - (days) 7 7	Admix Avg. Dia. (in.)	Tare ture We Avg. Hght. (in.)	e Weigh eight (g Avg. Area (in.)	nt (lbs): m): Weight (g) 3776 3790	7.60 - Admix Unit Wt. (pcf) 143.1 143.6	T kture Pe Cap* U U	Care & Conc ercent (%): B Load (lbs) 59985 54125	rete We	eight (lbs Moistu nformatio rength (psi) 1770 1310): re Con on, C3 (psi) Ratio 106% 96%	43.20 ttent (%): 9 Break Type 3 3	Tech. DC DC
Tare Volur Soil Weigh Sample <u>No.</u> 20-02991 20-02992 20-02993	ne (cf):	0.25 - (days) 7 7 28	Admix Avg. Dia. (in.)	Tare ture We Avg. Hght. (in.)	e Weigh eight (g Avg. Area (in.)	nt (lbs): m): Weight (g) 3776 3790 3776	7.60 - Admix Unit Wt. (pcf) 143.1 143.6 143.1	T cture Pe Cap* U U U U	Care & Conc ercent (%): B Load (lbs) 59985 54125 75595	rete Wo	Moistu Moistu formatio rength (psi) 4770 4310 5020): re Con on, C3 (psi) Ratio 106% 96% 134%	43.20 ttent (%): 9 Break Type 3 3 5	Tech. DC DC DC
Tare Volur Soil Weigh Sample <u>No.</u> 20-02991 20-02992 20-02993 20-02994	ne (cf):	0.25 - (days) 7 7 7 28 28 28	Admix Avg. Dia. (in.)	Tare ture We Avg. Hght. (in.)	e Weigh eight (g Avg. Area (in.)	m: (lbs): m): Weight (g) 3776 3790 3776 3770	7.60 - Admix Unit Wt. (pcf) 143.1 143.6 143.1 142.9	T cture Pe Cap* U U U U U	Care & Conc ercent (%): B Load (lbs) 59985 54125 75595 80400	rete Wo	Moistu Moistu formatic rength (psi) 4770 4310 5020 5400): on, C39 (psi) Ratio 106% 96% 134% 142%	43.20 ttent (%): 9 Break Type 3 3 5 5 5	Tech. DC DC DC DC
Tare Volur Soil Weigh Sample No. 20-02991 20-02992 20-02993 20-02994 20-02995	ne (cf):	0.25 Age (days) 7 7 28 28 28 28	Admix Avg. Dia. (in.) 00 4	Tare ture We Hght. (in.)	e Weigh eight (g Avg. Area (in.)	nt (lbs): m): Weight (g) 3776 3770 3770 3770 3762	7.60 - Admix Unit Wt. (pcf) 143.1 143.6 143.1 142.9 142.6	T cap* U U U U U U U	Care & Concercent (%): B Load (lbs) 59985 54125 75595 80400 81570	rete We	Moistu formatic rength (psi) 4770 4310 5020 5400 5490): re Con on, C39 (psi) Ratio 106% 96% 134% 142% 144%	43.20 ttent (%): 9 Break Type 3 3 5 5 5 5 5	Tech. DC DC DC DC DC
Tare Volur Soil Weigh Sample <u>No.</u> 20-02991 20-02992 20-02993 20-02994 20-02995	ne (cf):	0.25 Age (days) 7 7 28 28 28 28	Admix Avg. Dia. (in.)	Tare iture We Avg. Hght. (in.)	e Weigh eight (g Avg. Area (in.)	m): m): Weight (g) 3776 3790 3776 3770 3770 3762	7.60 - Admix Unit Wt. (pcf) 143.1 143.6 143.1 142.9 142.6	T cture Pe Cap* U U U U U U U	Concent Concent B Load (lbs) 59985 54125 75595 80400 81570 Concent	rete Wo	Moistu formatic rength (psi) 1770 1310 5020 5400 5490): re Con on, C39 (psi) Ratio 106% 96% 134% 142% 144%	43.20 ttent (%): 9 Break Type 3 3 3 5 5 5 5	Tech. DC DC DC DC DC
Tare Volur Soil Weigh Sample <u>No.</u> 20-02991 20-02992 20-02993 20-02994 20-02995	ne (cf):	0.25 - Age (days) 7 7 28 28 28 28 28 28	Admix Avg. Dia. (in.) 00 7	Tare ture We Hght. (in.)	e Weigh eight (g Avg. Area (in.) LS:21	nt (lbs): m): Weight (g) 3776 3770 3776 3770 3762	7.60 - Admix Unit Wt. (pcf) 143.1 143.6 143.1 142.9 142.6	T cture Pe Cap* U U U U U U U	Care & Concercent (%): B Load (lbs) 59985 54125 75595 80400 81570	rete Wo	eight (lbs Moistu formation rength (psi) 4770 4310 5020 5400 5490): re Con on, C39 (psi) Ratio 106% 96% 134% 142% 144%	43.20 ttent (%): 9 Break Type 3 3 5 5 5 5	Tech. DC DC DC DC DC
Tare Volur Soil Weigh Sample <u>No.</u> 20-02991 20-02992 20-02993 20-02994 20-02995	ne (cf):	0.25 	Admix Avg. Dia. (in.) 00.4	Tare iture We Hght. (in.)	e Weigh eight (g Avg. Area (in.) LS221	m): m): Weight (g) 3776 3770 3776 3770 3770 3762 5. (if appli	7.60 - Admix Unit Wt. (pcf) 143.1 143.6 143.1 142.9 142.6 	T cure Pe Cap* U U U U U U U Cap* Cap	are & Conc arcent (%): B Load (lbs) 59985 54125 75595 80400 81570 0 0 0 0 0 0 0 0 0 0 0 0 0	rete Wo	rength (lbs Moistu formatic rength (psi) 4770 4310 5020 5400 5400 5490): re Con on, C39 (psi) Ratio 106% 96% 134% 142% 144%	43.20 tent (%): 9 Break Type 3 3 5 5 5 5	Tech. DC DC DC DC
Tare Volur Soil Weigh Sample <u>No.</u> 20-02991 20-02993 20-02993 20-02994 20-02995	ne (cf):	0.25 - Age (days) 7 7 28 28 28 28 28 28 28 28 28 28	Admix Avg. Dia. (in.) 00 7 RETE 3 99	Tare ture We Hght. (in.) 00 ∞ FIELD	e Weigh eight (g Avg. Area (in.) <i>L</i> 5: 21 CURE 12:50	nt (lbs): m): Weight (g) 3776 3770 3776 3770 3762 3762 576 3762 5762 3762 3762 3776 3776 3776 3776 3776 3776 37	7.60 - Admix Unit Wt. (pcf) 143.1 143.6 143.1 142.9 142.6 (cable), Cor 144.3	T cture Pee Cap* U U U U U U U U U U U U U	Care & Concercent (%): B Load (lbs) 59985 54125 75595 80400 81570 001 Prisms, 53255	rete Wo	eight (lbs Moistu formatic rength (psi) 4770 4310 5020 5400 5490 5490 rtar Cub): re Con on, C39 (psi) Ratio 106% 96% 134% 142% 144% es 95%	43.20 ttent (%): 9 Break Type 3 3 5 5 5 5 5 5	Tech. DC DC DC DC
Tare Volur Soil Weigh No. 20-02991 20-02992 20-02993 20-02994 20-02995 20-02995 20-02995 20-02995	ne (cf):	0.25 - Age (days) 7 7 28 28 28 28 28 28 28 28 7 7 7 7 7 7 7 7 7 7 7 7 7	Admix Avg. Dia. (in.) 00 4 RETE 3.99 4.01	Tare ture We Hght. (in.) 0 0 0 0 0 0 0 0 0 0 0 0 0	e Weigh eight (g Avg. Area (in.) <i>L</i> 5 27 12.50 12.63	nt (lbs): m): Weight (g) 3776 3770 3776 3770 3762 570 3762 578 3788 3770	7.60 - Admix Unit Wt. (pcf) 143.1 143.6 143.1 142.9 142.6 (cable), Cor 144.3 141.8	T cture Pee Cap* U U U U U U U U U U U U U	Care & Concent B Load (lbs) 59985 54125 75595 80400 81570 out Prisms, 53255 55050	rete Wo	eight (lbs Moistu formatic rength (psi) 4770 4310 5020 5400 5400 5490 5490 540): re Con on, C39 (psi) Ratio 106% 96% 134% 142% 144% 144% es 95% 97%	43.20 ttent (%): 9 Break Type 3 3 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	Tech. DC DC DC DC DC
Tare Volur Soil Weigh Sample <u>No.</u> 20-02991 20-02992 20-02993 20-02994 20-02995 20-02995 20-02995	ne (cf):	0.25 - Age (days) 7 7 28 28 28 28 28 28 28 28 7 7 7 7 7 7 7 7 7 7 7 7 7	Admix Avg. Dia. (in.) 00 + RETE 3.99 4.01	Tare ture We Hght. (in.) 8 8 6 7 7 7 8.00 8.02	e Weigh eight (g Avg. Area (in.) <i>L</i> 5 27 12.50 12.63	nt (lbs): m): Weight (g) 3776 3770 3776 3770 3762 55 (if appli 3788 3770	7.60 - Admix Unit Wt. (pcf) 143.1 143.6 143.1 142.9 142.6 (cable), Cor 144.3 141.8	T cture Pee Cap* U U U U U U U U U U U U U	are & Concenter (%): B Load (lbs) 59985 54125 75595 80400 81570 0 0 0 0 0 1 53255 55050 1 1 1 1 1 1 1 1 1 1 1 1 1	rete Wo	eight (lbs Moistu formatic rength (psi) 4770 4310 5020 5490 5490 5490 5490 5490 5490 5490 549): re Con on, C39 (psi) Ratio 106% 96% 134% 142% 142% 144% es 95% 95% 97%	43.20 ttent (%): 9 Break Type 3 3 5 5 5 5 5 5 5 5 5 5	Tech. DC DC DC DC DC
Tare Volur Soil Weigh No. 20-02991 20-02992 20-02993 20-02994 20-02995 20-02995 20-02995 20-02995	ne (cf):	0.25 - Age (days) 7 7 28 28 28 28 28 28 28 28 7 7 7 7 7 7 7 7 7 7 7 7 7	Admix Avg. Dia. (in.) 00 4 RETE 3.99 4.01	Tare ture We Hght. (in.) 00 ∞ FIELD 8.00 8.02	e Weigh eight (g Avg. Area (in.) <i>L</i> 5 21 CURE 12.63	nt (lbs): m): Weight (g) 3776 3770 3776 3770 3762 55 (if appli 3788 3770	7.60 - Admix Unit Wt. (pcf) 143.1 143.6 143.1 142.9 142.6 (cable), Cor 144.3 141.8	T cture Pee Cap* U U U U U U U U U U U U U	Care & Concercent (%): B Load (lbs) 59985 54125 75595 80400 81570 001 Prisms, 53255 55050	rete Wo	eight (lbs Moistu formatic rength (psi) 4770 4310 5020 5400 5400 5490 7tar Cub 4260 4360): re Con on, C39 (psi) Ratio 106% 96% 134% 142% 144% 144% es 95% 97%	43.20 ttent (%): 9 Break Type 3 3 5 5 5 5 5 5 5 5 5 5 5 5 5	Tech. DC DC DC DC DC
Tare Volur Soil Weigh No. 20-02991 20-02992 20-02993 20-02994 20-02994 20-02995 20-02994 20-02995 20-02995 20-03001 20-03001 20-03002 Cap Type	ne (cf):	0.25 Age (days) 7 7 28 28 28 28 28 28 CONC 7 7 7 Sulfur	Admix Avg. Dia. (in.) 00 4 RETE 3.99 4.01 G =	Tare iture We Hght. (in.) 0 8 8 9 8 9 8 9 8 9 8 9 9 8 9 9 8 9	e Weigh eight (g Avg. Area (in.) LSSC 12.63 m	nt (lbs): m): Weight (g) 3776 3790 3776 3770 3770 3762 578 3770 3788 3770 C=Neat C	7.60 - Admix Unit Wt. (pcf) 143.1 143.6 143.1 142.9 142.6 (cable), Cor 144.3 141.8 (cament	T cture Pee Cap* U U U U U U U U U U U U U	Concent (%): B Load (lbs) 59985 54125 75595 80400 81570 Dut Prisms, 53255 55050 000 Unbonded 000	rete Wo	eight (lbs Moistu formatic rength (psi) 4770 4310 5020 54000 5400 5400 5400 5400 54): re Con on, C39 (psi) Ratio 106% 96% 134% 142% 144% es 95% 97% 97% 0=N	43.20 ttent (%): 9 Break Type 3 3 5 5 5 5 5 5 5 5 5 5 5 5 5	Tech. DC DC DC DC DC
Tare Volur Soil Weigh No. 20-02991 20-02992 20-02993 20-02994 20-02995 20-02995 20-02995 20-02995 20-03001 20-03001 20-03002 Cap Type Remark	ne (cf): nt (gm): Break Date 09/18/20 10/09/20 10/09/20 10/09/20 10/09/20 09/18/20 09/18/20 \$ \$: S=5	0.25 - Age (days) 7 7 28 28 28 28 28 28 28 28 7 7 7 7 7 7 8 Sulfur	Admix Dia. (in.) 00 7 8 8 8 8 8 8 8 8 9 4.01 6 6	Tare ture We Hght. (in.) 00 00 00 00 00 00 00 00 00 0	e Weigh eight (g Avg. Area (in.) <i>L</i> 5 21 12.50 12.63 m	nt (lbs): m): Weight (g) 3776 3770 3776 3770 3772 3762 50 (if appli 3788 3770 5770 578 5770 578 5770 578 5770 5770	7.60 - Admix Unit Wt. (pcf) 143.1 143.6 143.1 142.9 142.6 cable), Cor 144.3 141.8 Cement	T cture Pee Cap* U U U U U U U U U U U U U	Concert Concert B Load (lbs) 59985 54125 75595 80400 81570 0 Dut Prisms, 53255 55050 0 Unbonded 0	rete Wo	eight (lbs Moistu formatic rength (psi) 4770 4310 5020 5400 5400 5490 6400 64000 6400 6400 6400 6400 64): re Con on, C39 (psi) Ratio 106% 96% 134% 142% 144% es 95% 97% O=N	43.20 ttent (%): 9 Break Type 3 3 5 5 5 5 5 5 5 5 5 5 5 5 5	Tech. DC DC DC DC DC
Tare Volur Soil Weigh No. 20-02991 20-02992 20-02993 20-02994 20-02994 20-02995 20-02994 20-02995 20-03001 20-03001 20-03002 Cap Type Remark	ne (cf):	0.25 Age (days) 7 7 28 28 28 28 28 28 CONC 7 7 7 Sulfur	Admix Avg. Dia. (in.) 00 4 RETE 3.99 4.01 G =	Tare ture We Hght. (in.) 0 2 5 FIELD 8.00 8.02 5 Gypsur	e Weigh eight (g Avg. Area (in.) LSSC 12.63 m	nt (lbs): m): Weight (g) 3776 3790 3776 3770 3770 3762 5 5 6 6 7 7 8 3770 3770 3770 5 7 8 8 3770 5 7 8 8 3770 5 7 8 8 3770 5 7 8 8 3770 5 7 8 8 3770 5 7 8 8 3770 5 7 8 8 3770 5 7 8 8 3770 5 7 8 8 3770 5 7 8 8 3770 5 7 8 8 3770 5 7 8 8 3770 5 7 8 8 3770 5 7 8 8 3770 5 7 8 8 3770 5 7 8 8 3770 5 7 8 8 3770 5 7 8 8 3770 5 7 8 8 3770 5 7 7 8 8 3770 5 7 7 8 8 3770 5 7 7 8 8 3770 5 3770 3770 3776 3770 3776 3770 3776 3770 3776 3770 3776 3770 3776 3770 3776 3770 3776 3770 3776 3770 3776 3770 3776 3770 3778 5 7 7 8 8 3770 3770 5 3770 3778 5 7 8 8 3770 5 3770 5 3770 5 3770 5 3770 3776 3770 3778 5 3770 3778 5 3770 3770 3770 3770 3770 3770 3770 37	7.60 - Admix Unit Wt. (pcf) 143.1 143.6 143.1 142.9 142.6 (cable), Cor 144.3 141.8 (cament	T cture Pee Cap* U U U U U U U U U U U U U	Concent Concent B Load (lbs) 59985 54125 75595 80400 81570 0 Dut Prisms, 53255 55050 0 Unbonded 0	rete Wo	eight (lbs Moistu formatic rength (psi) 4770 4310 5020 54000 5400 5400 5400 5400 54): re Con on, C39 (psi) Ratio 106% 96% 134% 142% 144% es 95% 97% 0=N	43.20 ttent (%): 9 Break Type 3 3 5 5 5 5 5 5 5 5 5 5 5 5 5	Tech. DC DC DC DC DC
Tare Volur Soil Weigh No. 20-02991 20-02992 20-02993 20-02993 20-02994 20-02995 20-02995 20-02995 20-03001 20-03001 20-03002 Cap Type Remark Field Set	ne (cf): nt (gm): Break Date 09/18/20 10/09/20 10/09/20 10/09/20 10/09/20 09/18/20 09/18/20 09/18/20 s: s: Number:	0.25 - Age (days) 7 7 28 28 28 28 28 28 28 28 28 28	Admix Avg. Dia. (in.) 00 7 RETE 3.99 4.01 G = of	Tare ture We Avg. Hght. (in.) 00 00 00 00 00 00 00 00 00 0	e Weigh eight (g Avg. Area (in.) <i>L</i> 5 CI 12.50 12.63 m	nt (lbs): m): Weight (g) 3776 3770 3776 3770 3770 3762 5 5 5 6 6 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	7.60 - Admix Unit Wt. (pcf) 143.1 143.6 143.1 142.9 142.6 cable), Cor 144.3 141.8 Cement	T cture Pee Cap* U U U U U U U U U U U U U	Comp	rete Wo	eight (lbs Moistu formatic rength (psi) 4770 4310 5020 5400 5400 5490 6400 64000 6400 6400 6400 6400 64): re Con on, C3 ⁽¹⁾ (psi) Ratio 106% 96% 134% 142% 144% es 95% 97% O=N e: <u>F</u> -50	43.20 ttent (%): 9 Break Type 3 3 5 5 5 5 5 5 5 5 5 5 5 5 5	Tech. DC DC DC DC DC
Tare Volur Soil Weigh No. 20-02991 20-02992 20-02993 20-02994 20-02994 20-02995 20-02994 20-03001 20-03001 20-03002 Cap Type Remark Field Set Field Scal	ne (cf):	0.25 - Age (days) 7 7 28 28 28 28 28 28 28 28 28 28	Admix Avg. Dia. (in.) 00 4 RETE 3.99 4.01 G = of	Tare ture We Hght. (in.) 0 2 5 FIELD 8.00 8.02 	e Weigh eight (g Avg. Area (in.) 25 27 12.50 12.63 m *Flow **Cu	nt (lbs): m): Weight (g) 3776 3790 3776 3770 3770 3762 5 CS (if appli 3788 3770 C=Neat C C=Neat C	7.60 - Admix Unit Wt. (pcf) 143.1 143.6 143.1 142.9 142.6 Cable), Cor 144.3 141.8 Cement	T cap* U U U U U U U U U U U U U	Concent B Load (lbs) 59985 54125 75595 80400 81570 Dut Prisms, 53255 55050 Unbonded Comp	rete Wo	eight (lbs Moistu formatic rength (psi) 4770 4310 5020 54000 5400 5400 5400 5400 540): re Con on, C39 (psi) Ratio 106% 96% 134% 142% 144% es 95% 97% 0=N c= F-50 e: F-50 e: L129	43.20 ttent (%): 9 Break Type 3 3 5 5 5 5 5 5 5 5 5 5 5 5 5	Tech. DC DC DC DC DC



REVIEW

Project No.:	01594 - 0009	Observed By: EA	Date: <u>9/9/20</u>
Project Name:	Ward Lake Reconstruction	Work Order No:	68735
Client Name:	Con-Sy Inc.	Authorized By: Client	Date: <u>9/9/20</u>
Installation Cont	ractor:	Reviewed By: JAL	Date: 9/9/20
Contractor Repr	esentative:		
Physical Addre	ss:		
Installation Equ	uipment:	Datum:	

A representative of Huddleston Berry Engineering and Testing (HBET) arrived on site as requested to pick up field cure cylinder test samples.

General Remarks:

Record No. 5 C



	Ta	sk / Ma	ateria	l Teste	ed:		pipe er	ncasem	ent				
Project No	D.:	01594	- 000)9					Authorized	By: Clier	nt Dat	e: 09/0	2/20
Project Na	ame: Wa	rd Lake	Recons	struction	1				Sampled By	y: KC	Dat	e: 09/0	2/20
Client Na	me: Con	n-Sy Inc	•						W	ork Order N	lo.:	68641	
General C	contractor:	Co	n-Sy In	с.					Picked Up 1	By: EA	Dat	e: 09/0	4/20
Placement	t Contracto	or: Co	n-Sy In	с.					W	ork Order N	lo.:	68615	
Contracto	r Represer	ntative:			W	Vayne			Reviewed E	By: CDF	R Dat	e: 10/0	2/20
Location	of Placen	nent:	all	remain	ing pip	pe encaser	nent sectio	ns and	outfall strue	cture base			
Complet			of allo a		. f f.	-11 - t.m t.m.							
Sample L	location:	center (of plac	ement	of outia	all structur	re base	licont	to placeme	nt			
Weather	Condition	Locatio ne•	II:			cloar ca	at Im	ijacem	to placeme	Ambient Te	mnora	ture (°F).	70s
vveather	Condition				Nur	nber of Sa	mnles Cast	ed/Mol	ded	Amblent It	mpera	ure (r).	703
Concr	ete: 9	*Grou	t Cyl:	0	**Gro	out Prism:	0 M	ortar C	vl: 0 1	Mortar Cube:	0	Soils: ()
	N	Aix Dat	a				Specificati	ions	<u> </u>	Measu	red Pro	nerties	
Su	- pplier: Wh	ite Wate	er			Temp., C	<u>1064 (deg.</u>	<u>F):</u>	50-90	Temp., C10	64 (deg.	F): 79	
Mix I	D/Brand:	C18H	-		•	Slun	1p, C143 (in	n.):	4	Slump,	C143 (i	n.): 4	•
Tick	et No.: 415	5500			•	Air Conte	nt, C231 (9	%): 6.5	5+/-1.5	Air Cont.,	C231 (%): 6.0	
В	atch Time	(MIL):		9:20			*Flow Ra	nte:			*Flow R	late:	
Sai	mple Time	(MIL):		12:04	τ	U nit Weig ł	nt, C138 (p	cf):	-	Unit Weight	, C138 (j	ocf): 140.8	
W	ater Addeo	l (gal.):		3		Time in	Mixer (mi	in):	90max	Time in M	lixer (m	in): 164	
	Load N	umber:	1 of	4		Additional	l Water (ga	ıl.):		I	Mold Di	ms: 4X8	
	Initial W:	C Ratio:	not su	pplied		Ma	x W:C Rat	tio:	4500	Fina	W:CR	atio:	
	Bat	tch Size:		6	•	Compres	sive Str. (p	si):	4500	Avg. Cap Th	ckness, Q		
Tare Volun	ne (cf):	0.25		Tare	e Weigh	nt (lbs):	7.60	Т	are & Concr	ete Weight (ll	os):	42.80	
Tare Volun Soil Weigh	ne (cf): nt (gm):	0.25	Admix	Tare ture We	e Weigh eight (g	nt (lbs): m):	7.60 - Admix	T kture Pe	are & Concr rcent (%):	ete Weight (ll - Mois	os): ture Coi	42.80 ntent (%):	-
Tare Volun Soil Weigh	ne (cf): nt (gm):	0.25	Admix Avg.	Tare ture We Avg.	e Weigh eight (g. Avg.	nt (lbs): m):	7.60 - Admix	T ature Pe	are & Concr rcent (%): Br	ete Weight (ll - Mois reak Informa	os): ture Con tion, C3	42.80 ntent (%):	
Tare Volum Soil Weigh	ne (cf): nt (gm): Break	0.25 - Age	Admix Avg. Dia.	Tare ture We Avg. Hght.	e Weigh eight (g Avg. Area	nt (lbs): m): Weight	7.60 - Admix Unit Wt.	T kture Pe	are & Concr rcent (%): Br	ete Weight (ll - Mois reak Informa Strength	os): ture Con tion, C3 (psi)	42.80 ntent (%): 9	-
Tare Volun Soil Weigh Sample No.	ne (cf): nt (gm): Break Date	0.25 - Age (days)	Admix Avg. Dia. (in.)	Tare ture We Avg. Hght. (in.)	e Weigh eight (g Avg. Area (in.)	nt (lbs): m): Weight (g)	7.60 - Admiz Unit Wt. (pcf)	T kture Pe Cap*	are & Concr rcent (%): _ Br Load (lbs)	ete Weight (ll - Mois reak Informa Strength (psi)	os): ture Con tion, C3 (psi) Ratio	42.80 ntent (%): 9 Break Type	- Tech.
Tare Volun Soil Weigh Sample No. 20-02887	ne (cf):	0.25 - Age (days) 3	Admix Avg. Dia. (in.)	Tare ature We Avg. Hght. (in.)	e Weigh eight (g Avg. Area (in.)	nt (lbs): m): Weight (g) 3724	7.60 - Admix Unit Wt. (pcf) 141.3	T sture Pe Cap* U	are & Concr rcent (%): Br Load (lbs) 42281	rete Weight (ll - Mois reak Informa Strength (psi) 3380	os): ture Con tion, C3 (psi) Ratio 75%	42.80 ttent (%): 9 Break Type 5	- Tech. KC
Tare Volum Soil Weigh Sample No. 20-02887 20-02888	ne (cf):	0.25 - Age (days) 3 7	Admix Avg. Dia. (in.)	Tare ature We Avg. Hght. (in.)	e Weigh eight (g Avg. Area (in.)	nt (lbs): m): Weight (g) 3724 3732	7.60 - Admix Unit Wt. (pcf) 141.3 141.6	T sture Pe Cap* U U	are & Concr rcent (%): Br Load (lbs) 42281 52710	rete Weight (ll - Mois reak Informa Strength (psi) 3380 4220	os):	42.80 ttent (%): 9 Break Type 5 5	Tech. KC DC
Tare Volum Soil Weigh Sample <u>No.</u> 20-02887 20-02888 20-02889	ne (cf):	0.25 - (days) 3 7 7 7	Admix Avg. Dia. (in.)	Tare ture We Avg. Hght. (in.)	e Weigh eight (g Avg. Area (in.)	tt (lbs): m): Weight (g) 3724 3732 3714 2728	7.60 - Admix Unit Wt. (pcf) 141.3 141.6 140.9 141.5	T cture Pe Cap* U U U U	are & Concr rcent (%):	ete Weight (ll - Mois reak Informa Strength (psi) 3380 4220 4440	os):	42.80 htent (%): 9 Break Type 5 5 5 5	Tech. KC DC DC
Tare Volum Soil Weigh Sample No. 20-02887 20-02888 20-02889 20-02890 20-02890	ne (cf):	0.25 Age (days) 3 7 7 7 7 7 28	Admix Avg. Dia. (in.)	Tare ture Wo Avg. Hght. (in.)	e Weigh eight (g Avg. Area (in.) 05 5	tt (lbs): m): Weight (g) 3724 3732 3714 3728 2734	7.60 - Admix Unit Wt. (pcf) 141.3 141.6 140.9 141.5 141.7	T cture Pe Cap* U U U U U	are & Concr rcent (%):	ete Weight (ll - Mois reak Informa Strength (psi) 3380 4220 4440 4110	os):	42.80 htent (%): 9 Break Type 5 5 5 5 5	Tech. KC DC DC DC
Tare Volun Soil Weigh Sample No. 20-02887 20-02888 20-02889 20-02890 20-02891 20-02892	ne (cf):	0.25 Age (days) 3 7 7 7 7 28 28 28	Admix Avg. Dia. (in.)	Tare iture Wo Avg. Hght. (in.)	e Weight eight (g Avg. Area (in.) 0527	nt (lbs): m): Weight (g) 3724 3732 3714 3728 3734 3712	7.60 - Admix Unit Wt. (pcf) 141.3 141.6 140.9 141.5 141.7 140.9	T cture Pe Cap* U U U U U U U U U	are & Concr rcent (%): _ Br Load (lbs) 42281 52710 55530 51330 56790 62670	Strength (psi) 3380 4220 4440 4110 4540 5010	os):	42.80 htent (%): 9 Break Type 5 5 5 5 5 5 5 5 5 5 5 5 5	Tech. KC DC DC DC DC
Tare Volum Soil Weigh No. 20-02887 20-02888 20-02889 20-02890 20-02891 20-02892 20-02893	ne (cf):	0.25 Age (days) 3 7 7 7 7 28 28 28 28 28	Admix Avg. Dia. (in.) 66. 8	Tare ture Wo Avg. Hght. (in.) [©]	e Weigh eight (g Avg. Area (in.) 0527	tt (lbs): m): Weight (g) 3724 3732 3714 3728 3734 3712 3726	7.60 - Admix Unit Wt. (pcf) 141.3 141.6 140.9 141.5 141.7 140.9 141.4	T cture Pe Cap* U U U U U U U U U U U U	are & Concr rcent (%):	rete Weight (II - Mois reak Informa Strength (psi) 3380 4220 4440 4110 4540 5010 5140	os):	42.80 ttent (%): 9 Break Type 5 5 5 5 5 5 5 5 5 5 5 5 5	Tech. KC DC DC DC DC DC DC
Tare Volum Soil Weigh No. 20-02887 20-02888 20-02889 20-02890 20-02891 20-02892 20-02893	ne (cf):	0.25 Age (days) 3 7 7 7 28 28 28 28 28	Admix Avg. Dia. (in.) 66 °.	Tare ture Wo Avg. Hght. (in.) \$000000000000000000000000000000000000	e Weight eight (g Avg. Area (in.) 05 21	tt (lbs): m): Weight (g) 3724 3732 3714 3728 3734 3712 3726	7.60 - Admix Unit Wt. (pcf) 141.3 141.6 140.9 141.5 141.7 140.9 141.4	T cture Pe Cap* U U U U U U U U U U U U	are & Concr rcent (%):	rete Weight (II - Mois reak Informa Strength (psi) 3380 4220 4440 4110 4540 5010 5140	os):	42.80 ttent (%): 9 Break Type 5 5 5 5 5 5 5 5 5 5 5 5 5	Tech. KC DC DC DC DC DC DC
Tare Volun Soil Weigh No. 20-02887 20-02888 20-02889 20-02890 20-02891 20-02892 20-02893	ne (cf):	0.25 Age (days) 3 7 7 7 28 28 28 28 28 CONC	Admix Avg. Dia. (in.) 66 °C RETE	Tare iture Wo Hght. (in.) \$00 \$50 \$50 \$50 \$50 \$50 \$50 \$50 \$50 \$50	e Weigh eight (g Avg. Area (in.) 05.21	tt (lbs): m): Weight (g) 3724 3732 3734 3734 3712 3726 ZS (if appli	7.60 - Admix Unit Wt. (pcf) 141.3 141.6 140.9 141.5 141.7 140.9 141.4 cable), Cor	T cture Pe Cap* U U U U U U U U U U U U U	are & Concr rcent (%): _ Br Load (lbs) 42281 52710 55530 51330 56790 62670 64280 out Prisms, o	rete Weight (II - Mois reak Informa Strength (psi) 3380 4220 4440 4110 4540 5010 5140 Dr Mortar Cu	bs):	42.80 ntent (%): 9 Break Type 5 5 5 5 5 5 5 5 5 5 5 5 5	Tech. KC DC DC DC DC DC DC
Tare Volum Soil Weigh No. 20-02887 20-02888 20-02889 20-02890 20-02891 20-02892 20-02893 20-02893	ne (cf):	0.25 Age (days) 3 7 7 7 28 28 28 28 28 28 28 28 7 7 7 7 7 7 7 7 7 7 7 7 7	Admix Avg. Dia. (in.) 66 % 8 RETE 4.00	Tare ture Wo Avg. Hght. (in.) © © FIELD 8.03	e Weigh eight (g Avg. Area (in.) 05 21 21 21 21 21 21 21 21 21 21 21 21 21	nt (lbs): m): Weight (g) 3724 3732 3714 3728 3734 3712 3726 CS (if appli 3732	7.60 - Admix Unit Wt. (pcf) 141.3 141.6 140.9 141.5 141.7 140.9 141.4 cable), Cor	T cture Pe U U U U U U U U U U U U U U U U	are & Concr rcent (%):	rete Weight (II - Mois reak Informa Strength (psi) 3380 4220 4440 4110 4540 5010 5140 0 0 Mortar Cu 3730	bs):	42.80 ntent (%): 9 Break Type 5 5 5 5 5 5 5 5 5 5 5 5 5	Tech. KC DC DC DC DC DC DC
Tare Volun Soil Weigh No. 20-02887 20-02888 20-02889 20-02890 20-02891 20-02892 20-02893 20-02893 20-02925 20-02925	ne (cf):	0.25 Age (days) 3 7 7 7 28 28 28 28 28 28 28 7 7 7 7 7 7 7 7 7 7 7 7 7	Admix Avg. Dia. (in.) 66 5 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	Tare ture Wo Avg. Hght. (in.)	e Weigh eight (g Avg. Area (in.) 05 27 12.57	nt (lbs): m): Weight (g) 3724 3732 3714 3728 3734 3712 3726 25 (if appli 3732 3756	7.60 - Admix Unit Wt. (pcf) 141.3 141.6 140.9 141.5 141.7 140.9 141.4 cable), Cor 140.9 141.1	T cture Pee Cap* U U U U U U U U U U U U U	are & Concr rcent (%): Br Load (lbs) 42281 52710 55530 51330 56790 62670 62670 64280 ut Prisms, c 46820 49670	rete Weight (II - Mois reak Informa Strength (psi) 3380 4220 4440 4110 4540 5010 5140 0 T Mortar Cu 3730 3950	bs):	42.80 ntent (%): 9 Break Type 5 5 5 5 5 5 5 5 5 5 5 5 5	Tech. KC DC DC DC DC DC DC DC
Tare Volun Soil Weigh No. 20-02887 20-02888 20-02889 20-02890 20-02891 20-02893 20-02893 20-02893 20-02925 20-02926	ne (cf):	0.25 Age (days) 3 7 7 7 28 28 28 28 28 28 28 28 7 7 7 7 7 7 7 7 7 7 7 7 7	Admix Avg. Dia. (in.) 66 82 RETE 4.00 4.00	Tare ture Wo Avg. Hght. (in.)	e Weigh eight (g Avg. Area (in.) 05 21 05 21 12.57 12.57	nt (lbs): m): Weight (g) 3724 3732 3734 3732 3734 3712 3726 S (if appli 3732 3756	7.60 - Admix Unit Wt. (pcf) 141.3 141.6 140.9 141.5 141.7 140.9 141.4 cable), Cor 140.9 141.1	T cture Pee Cap* U U U U U U U U U U U U U	are & Concr rcent (%):	rete Weight (II - Mois reak Informa Strength (psi) 3380 4220 4440 4110 4540 5010 5140 0 0 0 0 0 0 0 0 0 3730 3950 0 0 0 0 0 0 0 0 0 0 0 0 0	bs):	42.80 htent (%): 9 Break Type 5 5 5 5 5 5 5 5 5 5 5 5 5	Tech. KC DC DC DC DC DC DC
Tare Volum Soil Weigh No. 20-02887 20-02888 20-02889 20-02890 20-02891 20-02892 20-02893 20-02893 20-02925 20-02925	ne (cf):	0.25 Age (days) 3 7 7 28 28 28 28 28 28 28 28 7 7 7 7 7 7 28 28 28 28 28 28 28 28 28 28	Admix Avg. Dia. (in.) 66 °° 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	Tare ture Wo Avg. Hght. (in.)	e Weight eight (g Avg. Area (in.) 05 21 21 12.57 12.57	nt (lbs): m): Weight (g) 3724 3732 3714 3728 3734 3712 3726 25 (if appli 3732 3756	7.60 - Admix Unit Wt. (pcf) 141.3 141.6 140.9 141.5 141.7 140.9 141.4 cable), Cor 140.9 141.1	T cture Pee Cap* U U U U U U U U U U U U U	are & Concr rcent (%):	rete Weight (II - Mois reak Informa Strength (psi) 3380 4220 4440 4110 4540 5010 5140 0 0 Mortar Cu 3730 3950	bs):	42.80 ntent (%): 9 Break Type 5 5 5 5 5 5 5 5 5 5 5 5 5	Tech. KC DC DC DC DC DC DC
Tare Volum Soil Weigh No. 20-02887 20-02888 20-02889 20-02890 20-02891 20-02892 20-02893 20-02893 20-02925 20-02925 20-02926 Cap Type	ne (cf):	0.25 Age (days) 3 7 7 7 28 28 28 28 28 28 28 7 7 7 7 7 28 28 28 28 28 28 5 CONC	Admix Avg. Dia. (in.) 66 55 RETE 4.00 4.00 G =	Tare ture Wo Avg. Hght. (in.) Solution FIELD 8.03 8.07 Gypsu	e Weigh eight (g Avg. Area (in.) 05 27 12.57 12.57 12.57 m	nt (lbs): m): Weight (g) 3724 3732 3734 3732 3734 3712 3726 S (if appli 3732 3756 C=Neat C	7.60 - Admix Unit Wt. (pcf) 141.3 141.6 140.9 141.5 141.7 140.9 141.4 cable), Cor 140.9 141.1 cable, Cor	T cture Pee Cap* U U U U U U U U U U U U U	are & Concr rcent (%): Br Load (lbs) 42281 52710 55530 51330 56790 62670 64280 046820 46820 49670 Unbonded N	rete Weight (II - Mois reak Informa Strength (psi) 3380 4220 4440 4110 4540 5010 5140 0 T Mortar Cu 3730 3950 Neoprene	os):	42.80 ntent (%): 9 Break Type 5 5 5 5 5 5 5 5 5 5 5 5 5	Tech. KC DC DC DC DC DC DC
Tare Volum Soil Weigh No. 20-02887 20-02888 20-02889 20-02890 20-02890 20-02891 20-02892 20-02893 20-02893 20-02925 20-02925 20-02926 Cap Type Remark	ne (cf):	0.25 Age (days) 3 7 7 7 28 28 28 28 28 28 28 7 7 7 7 5 CONC 7 7 7 7 7 7 7 7 28 28 28 28 28 28 28 28 28 28	Admix Avg. Dia. (in.) 66 % RETE 4.00 4.00 G = lab cure	Tare ture Wo Avg. Hght. (in.) E0 S S FIELD 8.03 8.07 S Gypsu es (cylin	e Weigh eight (g Avg. Area (in.) 05 21 21 21 21 21 21 21 21 21 21 21 21 21	nt (lbs): m): Weight (g) 3724 3732 3714 3728 3734 3712 3726 CS (if appli 3732 3756 C=Neat C	7.60 - Admix Unit Wt. (pcf) 141.3 141.6 140.9 141.5 141.7 140.9 141.4 cable), Cor 140.9 141.1 cable, Cor	T cture Pe Cap* U U U U U U U U U U U U U	are & Concr rcent (%): Br Load (lbs) 42281 52710 55530 51330 56790 62670 64280 0 46820 49670 Unbonded M	rete Weight (II - Mois reak Informa Strength (psi) 3380 4220 4440 4110 4540 5010 5140 0 0 0 Mortar Cu 3730 3950 Neoprene	os):	42.80 ntent (%): 9 Break Type 5 5 5 5 5 5 5 5 5 5 5 5 5	Tech. KC DC DC DC DC DC DC
Tare Volum Soil Weigh No. 20-02887 20-02888 20-02889 20-02890 20-02891 20-02892 20-02893 20-02893 20-02925 20-02925 20-02926 Cap Type Remarks	ne (cf):	0.25 Age (days) 3 7 7 7 28 28 28 28 28 28 7 7 7 7 5 CONC 7 7 7 7 7 7 7 7 28 28 28 28 28 28 28 28 28 28	Admix Avg. Dia. (in.) 66 55 RETE 4.00 4.00 G = lab cure	Tare ture Wo Avg. Hght. (in.) (in.)	e Weigh eight (g Avg. Area (in.) 05 27 12.57 12.57 12.57 m ders)	tt (lbs): m): Weight (g) 3724 3732 3734 3732 3734 3712 3726 CS (if appli 3732 3756 C=Neat C	7.60 - Admix Unit Wt. (pcf) 141.3 141.6 140.9 141.5 141.7 140.9 141.4 cable), Cor 140.9 141.1 Com Com Com Com Com Com Com Com	T Cap* U U U U U U U U U U U U U	are & Concr rcent (%): _ Br Load (lbs) 42281 52710 55530 51330 56790 62670 64280 046820 46820 49670 Unbonded N	ete Weight (ll - Mois reak Informa Strength (psi) 3380 4220 4440 4110 4540 5010 5140 0 T Mortar Cu 3730 3950 Neoprene	os):	42.80 ntent (%): 9 Break Type 5 5 5 5 5 5 5 5 5 5 5 5 5	Tech. KC DC DC DC DC DC DC
Tare Volum Soil Weigh No. 20-02887 20-02888 20-02889 20-02890 20-02891 20-02892 20-02893 20-02893 20-02925 20-02926 Cap Type Remarka Field Set	ne (cf):	0.25 - Age (davs) 3 7 7 28 28 28 28 28 28 28 28 28 28	Admix Avg. Dia. (in.) 665 88 88 88 4.00 4.00 4.00 G= 1ab curved	Tare ture Wo Avg. Hght. (in.)	e Weigh eight (g Avg. Area (in.) 05 21 21 21 21 21 21 21 21 21 21 21 21 21	nt (lbs): m): Weight (g) 3724 3732 3734 3732 3734 3712 3726 CS (if appli 3732 3756 C=Neat C	7.60 - Admix Unit Wt. (pcf) 141.3 141.6 140.9 141.5 141.7 140.9 141.4 cable), Cor 140.9 141.1 cable, Cor	T cture Pe U U U U U U U U U U U U U	are & Concr rcent (%):	rete Weight (II - Mois reak Informa Strength (psi) 3380 4220 4440 4110 4540 5010 5140 0 0 Mortar Cu 3730 3950 Neoprene	bs):	42.80 ntent (%): 9 Break Type 5 5 5 5 5 5 5 5 5 5 5 5 5	Tech. KC DC DC DC DC DC DC
Tare Volum Soil Weigh No. 20-02887 20-02888 20-02889 20-02890 20-02890 20-02891 20-02892 20-02893 20-02925 20-02925 20-02926 Cap Type Remarks Field Set Field Scal	ne (cf): nt (gm): Break Date 09/05/20 09/09/20 09/09/20 09/09/20 09/30/20 09/30/20 09/30/20 09/30/20 09/09/20 09/09/20 09/09/20 s: 5 field Number: he No.:	0.25 Age (days) 3 7 7 28 28 28 28 28 28 28 28 CONC 7 7 7 5 CONC 7 7 1 1	Admix Avg. Dia. (in.) 66 5 RETE 4.00 4.00 G = lab cure of	Tare ture Wo Avg. Hght. (in.)	e Weigh eight (g Avg. Area (in.) 05 27 27 12.57 12.57 12.57 12.57 m ders) *Flow **Cu	nt (lbs): m): Weight (g) 3724 3732 3714 3728 3734 3712 3726 CS (if appli 3732 3756 C=Neat C Cone No.: be Mold N	7.60 - Admix Unit Wt. (pcf) 141.3 141.6 140.9 141.5 141.7 140.9 141.4 cable), Cor 140.9 141.1 cable), Cor 140.9 141.1 cable, Cor	T cture Pe Cap* U U U U U U U U U U U U U	are & Concr rcent (%): Br Load (lbs) 42281 52710 55530 51330 56790 62670 64280 046820 46820 49670 Unbonded M Unbonded M	rete Weight (II - Mois reak Informa Strength (psi) 3380 4220 4440 4110 4540 5010 5140 0 0 Mortar Cu 3730 3950 - Neoprene ression Machi Lab Sca	bs):	42.80 ntent (%): 9 Break Type 5 5 5 5 5 5 5 5 5 5 5 5 5	Tech. KC DC DC DC DC DC DC



	Та	ck / M	otorio	1 Tost	d	nir	na ancacar	nont (f	field cure)				
Project N	1a 0 ·	01504		11 1 CSU	.u	- Pił			Authorized	By: Clier	nt Dot	o• 08/2	8/20
Project No	0 9mo: Wa	ord Lake	- 00	struction					Sampled By	$\frac{\mathbf{D}\mathbf{y}}{\mathbf{r}} = \frac{\mathbf{C}\mathbf{H}\mathbf{e}}{\mathbf{F}}$	<u>n</u> Date Date	0.08/2	8/20
Client Na	$\frac{1}{100}$	n-Sy Inc	Recon	struction	1				Sampled Dy	ork Order N		68543	.0/20
Ceneral (antractor		n-Sv In	C.					Picked Un I	Rv. FA	Dat	• 08/2	9/20
Placement	t Contracto	$\frac{Cont}{Cont}$	n-Sv In	ю. ПС					W	ork Order N		68542	0120
Contracto	r Represei	ntative:	n Sy III		v	Vavne			Reviewed B	v: CDF	No No	e: 09/2	8/20
Location	of Discor	nant.	2.	of 6 ago	tions	f ontiro ni	n o o n ooson	ant: 2	ato goorad n	iococ startin	<u>from</u> N	Jorth side	0/20
Location	of Flacen	lent:	30		tions o	or entitle pr	pe encasen	lient. 5	staggered p	leces starting	g monn r	North Side	
Sample I	ocation:	center	of plac	ement	South	section							
Cylinder	r Storage 1	Locatio	n:				a	ljacent	to placeme	nt			
Weather	r Conditio	ns:				partly clo	oudy	5	1	Ambient Te	mperat	ture (°F):	70s
					Nu	mber of Sa	mples Cast	ted/Mo	lded				
Concr	ete: 5	*Grou	t Cvl:	0	**Gre	out Prism:	0 M	ortar C	vl: 0 1	Mortar Cube:	0	Soils: ()
		Mix Dot	0				Specificat	long	<u> </u>	Moogu	rod Dro	nortios	
Su	nnlier• Wh	viix Dau nite Wate	<u>a</u> r			Temp. C	<u>'1064</u> (deg	<u>F)</u> .	50-90	Temp. C10	64 (deg	$\frac{\text{perces}}{\text{F}} \approx 87$	
Mix I	D/Brand:	C18H	21		•	Slun	np. C143 (i	n.):	4	Slump.	C143 (i	n_{1} : 4	-
Tick	et No.: 415	5300			•	Air Conte	ent. C231 (9	%): 6.:	5+/-1.5	Air Cont.	C231 (%): 5.0	-
В	atch Time	(MIL):		9:21	•		*Flow Ra	nte:		,	*Flow R	ate:	-
Sa	mple Time	(MIL):		12:19	1	U <mark>nit Weig</mark> l	nt, C138 (p	cf):	-	Unit Weight	, C138 (p	ocf): -	-
W	ater Addeo	d (gal.):		_		Time in	n Mixer (mi	in):	90max	Time in M	lixer (m	in): 178	
	Load N	umber:	1 of	3		Additional	l Water (ga	ıl.):		I	Mold Di	ms: 4X8	
Batch Time (MIL): 9:21 Sample Time (MIL): 12:19 Water Added (gal.): - Load Number: 1 of 3 Initial W:C Ratio: Max W:C Batch Size: 6 Compressive St Fare Volume (cf): - Tare Weight (lbs): -								tio:		Fina	W:C Ra	ntio:	
	Ba	tch Size:		6		Compres	sive Str. (p	si):	4500	Avg. Cap Thi	ckness, (C42:	
Tare Volur Soil Weigh	me (cf): ht (gm):	-	Admiz	Tare kture Wo	e Weigh eight (g	nt (lbs): gm):	- Admiz	T kture Pe	are & Concretered	ete Weight (ll	ture Cor	141.30	_
Sample	Break	Аде	Avg. Dia	Hoht	Avg. Area	Weight	Unit Wt		DI	Strongth	(nsi)	<i>,</i>	1
No.	Date	(days)	(in.)	(in.)	(in.)	(g)	(pcf)	Cap*	Load (lbs)	(psi)	Ratio	Break Type	Tech.
20-02882	09/04/20	7				3788	143.2	U	80750	6430	143%	5	DC
20-02883	09/04/20	7				3772	142.6	U	74150	5900	131%	5	DC
20-02884	09/25/20	28				3804	143.8	U	86650	6900	153%	3	DC
20-02885	09/25/20	28	00	02	.57	3820	144.4	U	82560	6570	146%	3	DC
20-02886	09/25/20	28	4.	×.	12	3810	144.0	U	80240	6390	142%	3	DC
		CONC	RETE	FIELD	CURF	ES (if appli	L cable). Cor	es. Gra	ut Prisms, o	or Mortar Cu	ibes		
Cap Type	*: S=	Sulfur	G	=Gypsu	m	C=Neat C	Cement	U=	Unbonded N	Veoprene	O=N	None	
Remark	s: <u>5 field</u>	cures 7	lab cur	es (cylin	ders)								
E:-13.0 ·	N1	1	of	1	ж Г 1	Corrent				and a Marth	no. F 50	2	
Field Set	le No :	1	01	1	*FlOW	tone No.:			Compi	ression Machi	$\frac{1}{100} = \frac{1}{100}$	9	
	D 110				Cu		0				ис. <u>L12</u>	,	
Building	Permit N	umber:					_				Reco	ord No	1 C



	Ta	sk / Ma	ateria	l Test	ed:		pipe er	ncasen	nent				
Project N	0.:	01594	- 00	09					Authorized	By: Client	Date	e: 08/2	8/20
Project N	ame: Wa	rd Lake	Recon	struction	1				Sampled By	EA EA	Date	e: 08/2	8/20
Client Na	me: Con	n-Sy Inc	•						W	ork Order No	.:	68543	
General C	Contractor:	Co	n-Sy In	с.					Picked Up I	By: EA	Date	e: 08/2	9/20
Placemen	t Contracto	or: Co	n-Sy In	с.					W	ork Order No).:	68542	
Contracto	or Represer	ntative:			1	Wayne			Reviewed B	Sy: CDR	Date	e: 09/2	8/20
Location	of Placen	nent:	3 0	of 6 sec	tions of	of entire pi	pe encasen	nent: 3	staggered p	ieces starting	from N	North side	
Sample I	ocation	center	of plac	ement	South	section							
Cylinde	r Storage 1		n•		South	section	3(liacent	to placeme	nt			
Weather	r Condition	ns:				partly clo	oudv	ijacem		Ambient Ter	nperat	ure (°F):	70s
					Nu	mber of Sa	mples Cast	ted/Mo	lded		- r		
Concr	ete: 7	*Grou	t Cyl:	0	**Gr	out Prism:	0 M	ortar C	Cyl: 0 M	Mortar Cube:	0	Soils: (0
	N	Mix Dat	a		·		Specificat	ions	<u> </u>	Measur	ed Pro	perties	
Su	pplier: Wh	ite Wate	er			Temp., C	1064 (deg.	F):	50-90	Temp., C106	4 (deg.	F): 87	
Mix I	D/Brand:	C18H			•	Slun	np, C143 (i	n.):	4	Slump, (C143 (ii	n.): 4	-
Tick	et No.: 415	5300				Air Conte	nt, C231 (9	%): 6.	5+/-1.5	Air Cont.,	C231 (9	%): 5.0	-
B	atch Time	(MIL):		9:21			*Flow Ra	ate:		*	Flow R	ate:	
Sa	mple Time	(MIL):		12:19	.	Unit Weigł	nt, C138 (p	cf):	-	Unit Weight,	C138 (p	cf):	_
W	ater Addec	d (gal.):		-	.	Time in	n Mixer (mi	in):	90max	Time in Mi	xer (mi	in): 178	_
	Load N	umber:	1 of	3		Additional	l Water (ga	ıl.):		Μ	lold Di	ms: 4X8	_
	Initial W:	C Ratio:				Ma	ax W:C Ra	tio:		Final	W:C Ra	tio:	_
	Bat	tch Size:		6	.	Compres	sive Str. (p	si):	4500	Avg. Cap Thic	kness, C	242:	-
Tare Volu	ne (cf):	-		Tare	e Weig	ht (lbs)	_	Г	Fare & Concr	ete Weight (lbs	s)· 1	41 30	
Soil Weig	nt (gm):	_	Admix	ture W	eight (g	em):	- Admiz	sture Pe	ercent (%):	- Moist	ire Con	tent (%):	-
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~			Δνσ	Δνσ	Δνσ		<u> </u>			eak Informati	on C3	<b>)</b>	
Sample	Break	Age	Dia.	Hght.	Area	Weight	Unit Wt.			Strength	(nsi)		[
No.	Date	(days)	(in.)	(in.)	(in.)	(g)	(pcf)	Cap*	Load (lbs)	(psi)	Ratio	Break Type	Tech.
20-02828	08/31/20	3				3799	143.8	U	57910	4610	102%	5	DC
20-02829	09/01/20	4				3789	143.4	U	63080	5020	112%	3	DC
20-02830	09/02/20	5				3788	143.4	U	65240	5190	115%	5	DC
20-02831	09/04/20	7	00	01	.57	3798	143.8	U	70690	5630	125%	3	DC
20-02832	09/25/20	28	4	×.	12	3798	143.8	U	81050	6450	143%	5	DC
20-02833	09/25/20	28				3790	143.5	U	82370	6550	146%	3	DC
20-02834	09/25/20	28				3784	143.2	U	85710	6820	152%	3	DC
		CONC	RETE	 FIELD	CUR	ES (if appli	cable), Cor	es, Gro	 out Prisms, a	or Mortar Cul	oes		
									/				
Сар Туре	*: S=	Sulfur	G=	=Gypsu	m	C=Neat C	Cement	U=	Unbonded N	Neoprene	O=N	lone	
Remark	s: <u>5 field</u>	cures 7	lab cure	es (cylin	ders)								
Field Set	Number:	1	of	1	*Flov	v Cone No.:			Compi	ression Machin	e: <u>F-5</u> 0	2	
Field Sca	le No.:				**Cı	ube Mold N	o.:			Lab Scal	e: <u>L12</u>	)	
Building	Permit N	umher·									Reco	rd No	1 C

1

	(		Hu	ddlesto neering & T	n-Berr		PROPE	RTIE	S AND (	COMPRES	SIVE TE	STREN( ST REP(	GTH ORT
	$\begin{tabular}{ c c c c c c c c c c c c c c c c c c c$												
Project N	lo.:	01594	- 000	)9					Authorize	d By: Clier	nt Date	e: 11/0	6/20
Project N	lame: Wa	ard Lake	Recons	struction	1				Sampled B	By: CDH	<u> </u>	e: <u>11/0</u>	6/20
Client Na	me: Co	n-Sy Inc	•						I	Work Order N	lo.:	69944	
General	Contractor:	Co	n-Sy In	с.					Picked Up	<b>By:</b> AB	Date	e: 11/0	7/20
Placemer	nt Contracto	or: <u>Co</u>	n-Sy In	с.					V	Work Order N	lo.:	69981	
Contract	or Represei	ntative:			W	/ayne			Reviewed	By: CDF	<u> </u>	e: <u>12/0</u>	4/20
Location	n of Placen	nent:	Ga	te Con	trol Su	pport Stru	cture						
Sample	Location:	Center	of Stru	icture									
Cylinde	er Storage	Locatio	n:		In Re	d Cooler I	North of D	am. Fi	eld cures a	re at gate cont	trol strue	cture.	
Weathe	er Conditio	ns:				Cloud	у			Ambient Te	mperat	ure (°F):	50's
					Nur	nber of Sa	mples Cast	ed/Mo	lded				
Conc	rete: 7	*Grou	ıt Cyl:	0	**Gro	out Prism:	<u>0</u> M	ortar C	<b>cyl:</b> 0	Mortar Cube:	0	Soils: (	)
	Ι	Mix Dat	a				Specificati	ons		Measu	red Pro	perties	
S	upplier: Wh	nite Wate	er			Temp., C	1064 (deg.	<b>F):</b>	50-90	Temp., C10	64 (deg.	<b>F</b> ): 65	
Mix	ID/Brand:	C18H				Slun	np, C143 (in	n.):	4	Slump,	C143 (ii	<b>n.):</b> 4 1/2	
Tic	ket No.: 418	8630				Air Conte	nt, C231 (%	<b>(6</b> ): 6.	5+/-1.5	Air Cont.,	C231 (9	%): 5.4	
]	Batch Time	(MIL):		10:45			*Flow Ra	ite:			*Flow R	ate:	
Sa	ample Time	(MIL):		13:11	U	J <b>nit Weig</b> ł	nt, C138 (po	cf):	-	Unit Weight	, C138 (p	cf): 140.2	
V	Vater Adde	d (gal.):		2		Time in	Mixer (mi	n):	90max	Time in M	lixer (m	i <b>n):</b> 146	
	Load N	umber:	1 of	1		Additional	Water (ga	l.):		I	Mold Di	ms: 4X8	
	Initial W:	C Ratio:	not su	pplied		Ma	x W:C Rat	tio:		Fina	W:C Ra	tio:	
	Ba	tch Size:		2		Compres	sive Str. (p	si):	4500	Avg. Cap Thi	ckness, C	242:	
Fare Volu	me (cf):	0.25		Tare	Weigh	t (lbs).	746	т	are & Conc	erete Weight (1)	ne).	42 50	
Soil Weig	the (er):	-	Admix	ture We	eight (g	m):	- Admix	ture Pe	ercent (%):	Mois	ture Con	tent (%):	-
		1	Avg.	Avg.	Avg.				В	reak Informa	tion, C3	9	
Sample	Break	Age	Dia.	Hght.	Area	Weight	Unit Wt.			Strength	(psi)		
No.	Date	(days)	(in.)	(in.)	(in.)	(g)	(pcf)	Cap*	Load (lbs)	) (psi)	Ratio	Break Type	Tech.
20-03886	5 11/13/20	7				3668	139.0	U	42595	3390	75%	5	DC
20-03887	/ 11/18/20	12				3714	140.8	U	54185	4310	96%	5	DC
20-03888	3 12/04/20	28				3708	140.5	U	58930	4690	104%	5	DC
20-03889	0 12/04/20	28	00	00.	2.57	3700	140.2	U	61230	4870	108%	5	DC
			4	~	12								
			•										
		CONC	RETE	FIFLD	CURF	S (if annli	cable) Cor	es Gra	ut Prisms	or Mortar Ci	ihes		
20-03890	11/13/20	7	4 00	8.02	12 57	3694	139 7	U II	44370	3530	78%	5	DC
20-03891	12/04/20	28	3.99	8.02	12.57	3690	140.2	U	59480	4760	106%	5	DC
20-03892	2 12/04/20	28	4.01	8.02	12.63	3678	138.4	U	60705	4810	107%	5	DC
												-	
Сар Тур	e*: S=	Sulfur	G=	Gypsu	m	C=Neat C	ement	U=	Unbonded	Neoprene	O=N	lone	
Remar	ks: Tested	air on a	rrival. V	Was 2.6	Added	1/2 of air	bag. Tested	second	time 3.1. W	WW then added	whole b	ag. Test	
results wa	is all compos	site sam	pied fro	m the th	nird rou	nd of testin	ıg.						
Field Se	t Number:	1	of	1	*Flow	Cone No.:			Com	pression Machi	ne: <u>F-50</u>	2	
Field Sca	ale No.:				**Cu	be Mold N	o.:			Lab Sca	ale: L129	7	



	Та	sk / Ma	ateria	l Teste	ed:		Gate Con	trol St	ructure				
Project No	0.:	01594	- 000	)9					Authorized	Bv: Client	Date	: 11/0	6/20
Project Na	ame: Wa	ard Lake	Recons	struction	1				Sampled By:	CDR	-Date	: 11/0	6/20
Client Na	me: Co	n-Sy Inc	•						W	ork Order No.	:	69944	
General C	Contractor	Co	n-Sy In	c.					Picked Up B	y: AB	Date	: 11/0	7/20
Placement	t Contract	or: Co	n-Sy In	с.					Ŵ	ork Order No.	:	69981	
Contracto	or Represe	ntative:	•		V	Vayne			<b>Reviewed By</b>	DRAFT	Date	:	
Location	of Placen	nent:	Ga	te Con	trol Su	pport Stru	cture				_		
20000000						pponour							
Sample L	location:	Center	of Stru	icture									
Cylinder	r Storage	Locatio	n:		In Re	ed Cooler	North of D	am. Fie	eld cures are	at gate contro	l struc	ture.	
Weather	· Conditio	ns:				Cloud	у		A	Ambient Tem	perati	ure (°F):	50's
					Nu	mber of Sa	mples Cast	ed/Mol	ded				
Concre	ete: 7	*Grou	t Cyl:	0	**Gro	out Prism:	<u>0</u> M	ortar C	<b>yl:</b> 0 M	lortar Cube:	0	Soils: (	)
	I	Mix Dat	a				Specificat	ions		Measure	d Prop	oerties	
Su	pplier: W	nite Wate	er			Temp., C	1064 (deg.	<b>F):</b>	50-90	Temp., C1064	(deg. ]	<b>F):</b> 65	
Mix I	D/Brand:	C18H				Slun	np, C143 (i	n.):	4	Slump, C	143 (ir	<b>a.):</b> 4 1/2	
Tick	Mix ID/Brand:         C18H           Ticket No.:         418630           Batch Time (MIL):         10:45           Sample Time (MIL):         13:11           Water Added (gal.):         2           L cod Number:         1 of 1					Air Conte	ent, C231 (9	<b>%):</b> 6.5	5+/-1.5	Air Cont., C	231 (%	<b>6):</b> 5.4	
B	Mix ID/Brand:C18HTicket No.:418630Batch Time (MIL):10:4:Sample Time (MIL):13:1Water Added (gal.):2Load Number:1 of 1Initial W:C Ratio:not suppliedBatch Size:2						*Flow Ra	te:		*]	Flow Ra	nte:	
Sai	mple Time	(MIL):		13:11	י   י	Unit Weigl	nt, C138 (p	cf):	-	Unit Weight, (	C138 (p	cf): 140.2	
W	ater Adde	d (gal.):	1 6	2		Time ir	n Mixer (mi	n):	90max	Time in Mix	er (mi	n): <u>146</u>	
	Load N	umber:	l of	1		Additiona	l Water (ga	l.):		M	old Dir	$\frac{4X8}{2}$	
	Initial W:	C Ratio:	not su			Compres	ix w:C Ka wiyo Str. (n	uo:	4500	Final V		110: 	
	Da	ten size:		L	•	Compres	sive su. (p	SI):	4300	Avg. Cap Thick	ness, C	42:	
Tare Volun	ne (cf):	0.25		Tare	e Weigł	nt (lbs):	7.46	Т	are & Concre	te Weight (lbs)	:	42.50	
Soil Weigh	nt (gm):	_	Admix	ture We	eight (g	m):	- Admiz	ture Pe	rcent (%):	- Moistu	re Con	tent (%):	_
Soil Weigh	nt (gm):	-	Admix	ture We	eight (g	m):	- Admix	ture Pe	rcent (%):	- Moistu	re Con	tent (%):	-
Soil Weigh	nt (gm): Break	- Age	Admix Avg. Dia.	ture We Avg. Høht.	eight (g Avg. Area	m): Weight	- Admiz	cture Pe	rcent (%):Bre	- Moistur	re Cont on, C39	tent (%):	-
Soil Weigh	nt (gm): Break Date	- Age (days)	Admix Avg. Dia. (in.)	ture We Avg. Hght. (in.)	eight (g Avg. Area (in.)	m): Weight (g)	- Admiz Unit Wt. (pcf)	ture Pe Cap*	rcent (%): Bre Load (lbs)	- Moistur ak Informatio Strength (psi)	re Cont o <b>n, C39</b> (psi) Ratio	tent (%): Break Type	- Tech.
Soil Weigh Sample No. 20-03886	nt (gm): Break Date 11/13/20	Age (days) 7	Admix Avg. Dia. (in.)	Avg. Avg. Hght. (in.)	eight (g Avg. Area (in.)	m): Weight (g) 3668	- Admix Unit Wt. (pcf) 139.0	cture Pe Cap* U	rcent (%): Bre Load (lbs) 42595	- Moistu ak Informatio Strength (psi) 3390	re Cont on, C39 (psi) Ratio 75%	tent (%): Break Type	- Tech. DC
Soil Weigh Sample No. 20-03886 20-03887	nt (gm): Break Date 11/13/20 11/18/20	Age (days) 7 12	Admix Avg. Dia. (in.)	Avg. Hght. (in.)	eight (g Avg. Area (in.)	m): Weight (g) 3668 3714	- Admix Unit Wt. (pcf) 139.0 140.8	cap* Cap U U	rcent (%): Bre Load (lbs) 42595 54185	- Moistur ak Informatio Strength (psi) 3390 4310	re Cont on, C39 (psi) Ratio 75% 96%	tent (%): Break Type 5 5	- Tech. DC DC
Soil Weigh Sample No. 20-03886 20-03887 20-03888	Break Date 11/13/20 11/18/20 12/04/20	Age (days) 7 12 28	Admix Avg. Dia. (in.)	Avg. Hght. (in.)	eight (g Avg. Area (in.)	m): Weight (g) 3668 3714 3708	- Admix Unit Wt. (pcf) 139.0 140.8 140.5	cap*	rcent (%): Bre Load (lbs) 42595 54185	- Moistur ak Informatio Strength (psi) 3390 4310	re Cont on, C39 (psi) Ratio 75% 96%	tent (%): Break Type 5 5	Tech. DC DC
Soil Weigh Sample No. 20-03886 20-03887 20-03888 20-03889	Break Date 11/13/20 11/18/20 12/04/20 12/04/20	Age (days) 7 12 28 28 28	Admix Avg. Dia. (in.)	Avg. Hght. (in.)	Avg. Area (in.)	m): Weight (g) 3668 3714 3708 3700	- Admix Unit Wt. (pcf) 139.0 140.8 140.5 140.2	Cap*	rcent (%): Bre Load (lbs) 42595 54185	- Moistu ak Informatio Strength (psi) 3390 4310	re Cont n, C39 (psi) Ratio 75% 96%	tent (%): Break Type 5 5	Tech. DC DC
Soil Weigh Sample No. 20-03886 20-03887 20-03888 20-03889 	Break Date 11/13/20 11/18/20 12/04/20 12/04/20	Age (days) 7 12 28 28 28	Admix Avg. Dia. (in.) 00 7	Avg. Hght. (in.)	eight (g Avg. Area (in.)	m): Weight (g) 3668 3714 3708 3700	- Admix Unit Wt. (pcf) 139.0 140.8 140.5 140.2	Cap*	rcent (%): Bre Load (lbs) 42595 54185	- Moistu ak Informatio Strength (psi) 3390 4310	re Control (psi) (psi) Ratio 75% 96%	Break Type 5 5	Tech. DC DC
Soil Weigh Sample No. 20-03886 20-03887 20-03888 20-03889 	Break Date 11/13/20 11/18/20 12/04/20 12/04/20	Age (days) 7 12 28 28 28	Admix Avg. Dia. (in.) 00. 4	Avg. Hght. (in.)	eight (g Avg. Area (in.)	m): Weight (g) 3668 3714 3708 3700	- Admix Unit Wt. (pcf) 139.0 140.8 140.5 140.2	Cap*	rcent (%): Bre Load (lbs) 42595 54185	- Moistu ak Informatio Strength (psi) 3390 4310	re Cont n, C39 (psi) Ratio 75% 96%	tent (%): Break Type 5 5	Tech. DC DC
Soil Weigh Sample No. 20-03886 20-03887 20-03888 20-03889 	Break Date 11/13/20 11/18/20 12/04/20 12/04/20	Age (days) 7 12 28 28 28	Admix Avg. Dia. (in.) 00 7	Avg. Hght. (in.)	eight (g Avg. Area (in.)	m): Weight (g) 3668 3714 3708 3700	- Admix Unit Wt. (pcf) 139.0 140.8 140.5 140.2	Cap* U U	rcent (%): Bre Load (lbs) 42595 54185	- Moistu ak Informatio Strength (psi) 3390 4310 0 0 0 0 0 0 0 0 0 0 0 0 0	re Control (psi) (psi) Ratio 75% 96%	tent (%): Break Type 5 5	Tech. DC DC
Soil Weigh           Sample           No.           20-03886           20-03887           20-03888           20-03888           20-03889	Break Date 11/13/20 11/18/20 12/04/20 12/04/20	Age (days) 7 12 28 28 28	Admix Avg. Dia. (in.) 00 4	Avg. Hght. (in.) 00 ∞	Avg. Area (in.)	m): Weight (g) 3668 3714 3708 3700 S (if appli	- Admix Unit Wt. (pcf) 139.0 140.8 140.5 140.2 	Cap* U U U	rcent (%): Bre Load (lbs) 42595 54185	- Moistu ak Informatio Strength (psi) 3390 4310	re Control (psi) Ratio 75% 96%	Break Type 5 5 5	Tech. DC DC
Soil Weigh  Sample No.  20-03886  20-03887  20-03888  20-03889   20-03889  20-03890  20-03890	Break Date 11/13/20 11/18/20 12/04/20 12/04/20	Age (days) 7 12 28 28 28 28 0 0 0 0 0 0 0 0 0 0 0 0 0	Admix Avg. Dia. (in.) 00 7 RETE	Avg. Hght. (in.) 00. %	eight (g Avg. Area (in.) LS ² 71	m): (g) 3668 3714 3708 3700 CS (if appli	- Admix Unit Wt. (pcf) 139.0 140.8 140.5 140.2	Cap* U U U es, Gro	rcent (%): Bre Load (lbs) 42595 54185 54185	- Moistu ak Informatio Strength (psi) 3390 4310	re Cont n, C39 (psi) Ratio 75% 96% 96% es	tent (%): Break Type 5 5 	Tech. DC DC
Soil Weigh No. 20-03886 20-03887 20-03888 20-03889 20-03889 20-03890 20-03891	Break           Date           11/13/20           11/18/20           12/04/20           12/04/20           11/13/20           12/04/20           12/04/20	Age (days) 7 12 28 28 28 28 28 0 0 0 0 0 0 0 0 0 0 0 0	Admix Avg. Dia. (in.) 00 + RETE	Avg. Hght. (in.) 00 $\infty$	Avg. Area (in.) LS:21	m): (g) 3668 3714 3708 3700 CS (if appli	- Admix Unit Wt. (pcf) 139.0 140.8 140.5 140.2 cable), Cor	Cap* U U U	rcent (%): Bre Load (lbs) 42595 54185	- Moistu ak Informatio Strength (psi) 3390 4310 4310	re Cont n, C39 (psi) Ratio 75% 96% 	tent (%): Break Type 5 5 	Tech. DC DC
Soil Weigh Sample No. 20-03886 20-03887 20-03888 20-03889 20-03890 20-03891 20-03892	Break Date 11/13/20 11/18/20 12/04/20 12/04/20 12/04/20 12/04/20 12/04/20	Age (days) 7 12 28 28 28 28 28 <b>CONC</b> 7 28 28 28	Admix Avg. Dia. (in.) 00. 4 RETE	Avg. Hght. (in.) 00 ∞	LS:21	m): Weight (g) 3668 3714 3708 3700 CS (if appli	- Admix Unit Wt. (pcf) 139.0 140.8 140.5 140.2	Cap* U U U es, Gro	rcent (%): Bre Load (lbs) 42595 54185	- Moistu ak Informatio Strength (psi) 3390 4310 4310	re Conton, C39 (psi) Ratio 75% 96% es	tent (%): Break Type 5 5 	Tech. DC DC
Soil Weigh  Sample No.  20-03886 20-03887 20-03888 20-03889  20-03889  20-03890 20-03891 20-03891 20-03892	Break           Date           11/13/20           11/18/20           12/04/20           12/04/20           12/04/20           12/04/20           12/04/20           12/04/20	Age (days) 7 12 28 28 28 28 <b>CONC</b> 7 28 28 28	Admix Avg. Dia. (in.) 00 7 RETE	FIELD	LS:21	m):	- Admix Unit Wt. (pcf) 139.0 140.8 140.5 140.2	cture Pe	rcent (%): Bre Load (lbs) 42595 54185 54185	- Moistu ak Informatio Strength (psi) 3390 4310 4310	re Control (psi) (psi) Ratio 75% 96% es	tent (%): Break Type 5 5 	Tech. DC DC
Soil Weigh  Sample No.  20-03886  20-03887  20-03888  20-03889  20-03890  20-03890  20-03891  20-03892  Cap Type	Break         Date         11/13/20         11/18/20         12/04/20         12/04/20         12/04/20         12/04/20         *:         S=	Age (days) 7 12 28 28 28 28 <b>CONC</b> 7 28 28 28 28 <b>Sulfur</b>	Admix Avg. Dia. (in.) 00 + RETE G=	Avg. Hght. (in.) 00 ∞ FIELD	Avg. Area (in.) LS:21	m):	- Admix Unit Wt. (pcf) 139.0 140.8 140.5 140.2 cable), Con Cement	Cap* U U U U ees, Gro	rcent (%): Bre Load (lbs) 42595 54185 54185  <u>out Prisms, or</u>  Unbonded No	- Moistu ak Informatio Strength (psi) 3390 4310 4310	re Control of the con	Break Type 5 5 5 6 6 6 6 6 6 7 6 7 6 7 6 7 6 7 6 7	Tech. DC DC
Soil Weigh  Sample No.  20-03886  20-03887  20-03888  20-03889  20-03890  20-03890  20-03891  20-03892  Cap Type Remark	Break         Date         11/13/20         11/18/20         12/04/20         12/04/20         12/04/20         12/04/20         12/04/20         s:         S:	- Age (days) 7 12 28 28 28 28 CONC 7 28 28 28 28 Sulfur air on a	Admix Avg. Dia. (in.) 8 4 RETE G= rrival. V	FIELD	eight (g Avg. Area (in.) LS:27 CURE	m):	- Admix Unit Wt. (pcf) 139.0 140.8 140.5 140.2 Cable), Con Coment bag. Tested	Cap* U U U V Cap* U U U U U U U U U U U = Second	rcent (%): Bre 10ad (lbs) 42595 54185 54185 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	- Moistu ak Informatio Strength (psi) 3390 4310 4310 Mortar Cube Mortar Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube Cube	re Cont n, C39 (psi) Ratio 75% 96% 96% es es O=N thole ba	Break Type 5 5 5 6 6 6 6 6 7 6 7 6 7 7 7 7 7 7 7 7	Tech. DC DC
Soil Weigh  Sample No.  20-03886 20-03887 20-03888 20-03889  20-03899  20-03890 20-03891 20-03891 20-03892  Cap Type Remark results was	Break         Date         11/13/20         11/18/20         12/04/20         12/04/20         12/04/20         12/04/20         state         S:         Tested         all compo	Age (days) 7 12 28 28 28 28 <b>CONC</b> 7 28 28 28 28 28 <b>Sulfur</b> air on an	Admix Avg. Dia. (in.) 00 4 RETE G= rrival. V bled fro	FIELD Was 2.6 m the th	CURE	m): Weight (g) 3668 3714 3708 3700  S700  CS (if appli CS (if appli  CS (if appli  CS (if appli  CS (if appli  CS (if appli )	- Admix Unit Wt. (pcf) 139.0 140.8 140.5 140.2 Cable), Con Coment bag. Tested ng.	Cap* U U U es, Gro	rcent (%): Bre 10ad (lbs) 42595 54185 54185 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	- Moistur ak Information Strength (psi) 3390 4310 4310 Contact Cubo Mortar Cubo Contact Cubo Cubo Contact Cubo Contact Cubo Cubo Contact Cubo Cubo Cubo Cubo Cubo Cubo Cubo Cubo Cubo Cubo Cubo Cubo Cubo Cubo Cubo Cubo Cubo Cubo Cubo Cubo Cubo Cubo Cubo Cubo Cubo Cubo Cubo Cubo Cubo Cubo Cubo Cubo Cubo Cubo Cubo Cubo Cubo Cubo Cubo Cubo Cubo Cubo Cubo Cubo Cubo Cubo Cubo Cubo Cubo Cubo Cubo Cubo Cubo Cubo Cubo Cubo Cubo Cubo Cubo Cubo Cubo Cubo Cubo Cubo Cubo Cubo C	re Control of the con	Break Type 5 5 5 6 6 6 6 6 7 6 7 6 7 7 7 7 7 7 7 7	Tech. DC DC
Soil Weigh No. 20-03886 20-03887 20-03888 20-03889 20-03890 20-03890 20-03891 20-03891 20-03892 Cap Type Remarka results was Fjeld Set	Break         Date         11/13/20         11/18/20         12/04/20         12/04/20         12/04/20         12/04/20         12/04/20         state         State         Tested         Sall compo         Number:	- Age (days) 7 12 28 28 28 28 CONC 7 28 28 28 Sulfur air on an site samp 1	Admix Avg. Dia. (in.) 00. 4 RETE G= rrival. V oled fro of	FIELD Was 2.6 m the tt 1	CURF	m): Weight (g) 3668 3714 3708 3700 <b>CS (if appli</b> <b>C=Neat C</b> 1/2 of air ind of testir Cone No	- Admix Unit Wt. (pcf) 139.0 140.8 140.5 140.2 Cable), Con Cable), Con Cable, Con Cable, Con Cable, Con	Cap* U U U U Eres, Groo	rcent (%): Bre 42595 54185 54185 000000000000000000000000000000000000	- Moistu ak Informatio Strength (psi) 3390 4310 4310 • Mortar Cube • Mortar Cube • Mortar Cube • Mortar Cube • Mortar Cube • Mortar Cube	re Cont n, C39 (psi) Ratio 75% 96% 96% es es O=N whole bases :: F-50'	Break Type 5 5 5 5 5 5 5 7 5 7 7 7 7 7 7 7 7 7 7	Tech. DC DC
Soil Weigh  Sample No.  20-03886  20-03887  20-03888  20-03889  20-03890  20-03890  20-03891  20-03891  20-03891  Cap Type Remarks results was Field Set Field Scal	Break         Date         11/13/20         11/18/20         12/04/20         12/04/20         12/04/20         12/04/20         12/04/20         set         Tested         all compo         Number:         le No.:	Age (days) 7 12 28 28 28 28 28 <b>CONC</b> 7 28 28 28 28 28 <b>Sulfur</b> air on ausite samp	Admix Avg. Dia. (in.) 00 4 RETE G= rrival. V pled fro of	FIELD Gypsur Was 2.6 m the tt 1	Legisht (g Avg. Area (in.) LSCI CURE	m): Weight (g) 3668 3714 3708 3700 CS (if appli CS	- Admix Unit Wt. (pcf) 139.0 140.8 140.5 140.2 (cable), Con (cable), Con (cab	Cap* U U U es, Gro	rcent (%): Bre 1000 (lbs) 42595 54185 54185 0000 0000 (lbs) 42595 54185 0000 0000 (lbs) 42595 54185 0000 0000 (lbs) 42595 54185 0000 0000 (lbs) 42595 54185 0000 0000 (lbs) 42595 54185 0000 (lbs) 42595 4259 4259 4259 4259 4259 4259 425	- Moistu ak Informatio Strength (psi) 3390 4310 4310 Comparison Mortar Cubo Mortar Cubo Comprene V then added we Ession Machine Lab Scale	re Cont n, C39 (psi) Ratio 75% 96% 96% es es O=N thole ba thole ba thole ba thole ba thole ba	tent (%): Break Type 5 5 5 6 7 7 7 7 7 7 7 7 7 7 7 7 7	Tech. DC DC

### APPENDIX C.2

#### QUALITY ASSURANCE TESTS BY DOWL

Ward Lake Dam Outlet Rehabilitation Final Construction Report Page 10 of 12

Percent Oversize	Corrected MC	Corrected DD
0	20.1	103.4
2	19.7	104.2
4	19.4	104.9
6	19.0	105.7
8	18.6	106.5
10	18.3	107.3
12	17.9	108.1
14	17.5	108.9
16	17.2	109.8
18	16.8	110.6
20	16.4	111.5
22	16.1	112.4
24	15.7	113.3
26	15.3	114.2
28	14.9	115.1
30	14.6	116.0
32	14.2	117.0
34	13.8	118.0
36	13.5	118.9
38	13.1	119.9
40	12.7	121.0
42	12.4	122.0
44	12.0	123.0
46	11.6	124.1
48	11.3	125.2
50	10.9	126.3

Deep Ward Lake - Screened #BS9















not indicative of apparently identical samples. are and esults are for the exclusive use of the client and apply only to the samples tested





<b>*</b>	JWL				F	CONCRETE CYL		ATA - CON	IPRESSIV		NGTH	I ANA	<b>LYSI</b>	S
	222 Montro	South Par ose, Colora	k Avenue do 81401			MASONRY GRO		CEMENT CUBE		RETE PRISM		GROUT	PRISM	
Sample Date:	August 28	970- 3, 2020	249-6828				Tech	nician: <b>J. H</b> a	arshman					
Project Name:	Deep War	rd Lake	Outlet Rep	air			Project S	et No. 2			Daily Se	t No. 2		
Project Number:	7122.748	44.01				9	Submitted to	Lab By: J. Ha	rshman		Da	te: 8	3/31/2	2020
Client:	Surface C	reek Di	tch and Re	servoir		Te	esting Reque	sted By: Dan	Quigley					
Concrete Supplier:	Whitew	ater Ma	terials Com	pany		Truck	#:	9	Ticket#:		001-	4153	00	
Mix Identification#:	C	18H Cla	ss D	Batch siz	e: <b>6</b>	cubic yards	Bat	ch Time: 9	21a	Sar	nple Ti	me:	1140	)a
Time in Mixer	ho	urs <b>21</b>	minutes	Wa	iter Added Bef	ore Sampling:	0	gallons		Ambient A	Air Tem	p. (°F.):	6	5
Maximum Size Aggre	egate:	3/4	inches		R	equired Streng	th: <b>40</b>	<b>00</b> psi a	t <b>28</b>	days				
Sample Location:	STA 0+	40 to 0+	65											
AREA/TYPE PLACEM	ENT:	X	CURB/GUTTER OTHER: <b>Pip</b>	e Casing	FLOOF	R SLAB		FOOTING		WALL				
SAMPLING:					WEIGHT:				CONCRET	F TEMPER	ATURE		OTHE	R
(Fresh Concrete)	(Free	sh Concrete) SHTO T14	1	XAS	TM C138		AASHTO T1	21	XASTM	C1064		]	01112	
ASTM C1019	(Grout)			_		Test Results				Te	est Resi	ults		
tr	ruck conveyo	r nozzle			142.6	6	lb/ft ³ (LBF	/cubic foot)		80		d	egrees	<u>F.</u>
AIR-CONTENT:				SLUMP	):				Num	ber of		1	0	
ASTM C153	AS	TM C173		Х	ASTM C143	AAS	SHTO T199		Appro	oximate siz	e of sp	ecimen	mold:	
X ASTM C231	AA	SHTO T19	5		ASTM C1611			_		Cyli	indrical	:		
	Test Resu	ilts				Test Resu	lts		X 4x8" CUBE	6x PRIS	12" м		Other	
5	.1	%	(percent)		1.	75	in.	inches)						
					LABORAT	ORY TEST D	ATA							
Specimens cured and	d tested in the	laboratory	in accordance	with:	Field cure X ASTM C31	ed and molded:	) Т23	Cylinders	Cubes ASTMC109	Drilleo AS	d Cores TM C42	Sto X	rage Ta ASTM C	nks :511
00501454	DATE	105		SPECIMEN ME	ASUREMENTS		CO	MPRESSIVE STRE	NGTH TEST DAT		C1231	CAP TYP	E	TECT
IDENTIFICATION	YEAR: 2020	IN DAYS	Diameter 1	Diameter 2	Average Diameter	Cross Sectional Area	LBF	PSI	FRACTURE TYPE # (See sketch below)	% of spec. achieved	NEO. PADS	GYP. CAP	Other	BY
9024	Sept. 4	7	4.00	4.00	4.00	12.57	64220	5110	3	100+	х			JLH
9025	Sept. 4	7	4.00	4.00	4.00	12.57	6508	5180	) 5	100+	х			JLH
9026	Sept. 25	28	4.00	4.01	4.01	12.60	8391	6660	) 3	100+	Х			SJ
9027	Sept. 25	28	4.00	4.01	4.01	12.60	82110	0 6520	) 3	100+	X			SJ
9028	Sept. 25	28	4.00	4.01	4.01	12.60	79810	0 6340	) 3	100+	X			SJ
AVERAGE S	5 <b>150</b> P	SI AT	7 DAYS	AVERAGE	6510	PSI AT	<b>28</b> D	AYS AV	ERAGE		PSI /	AT		DAYS
					FRACTUR	E PATTERN TYF	PES							
Type 1		Typ	e 2	Type 3		be 4	Type	5	Type 6	Note: T	ype 5 & 6 ith unbor	common Ided caps	ly	

	JWL				F	<b>IELD / LA</b>		A - COM	PRESSIV		NGTH	I ANA		S
	222 Montro	South Parl ose, Colora	k Avenue do 81401 249.6828			MASONRY GRO		VENT CUBE		ETE PRISM		GROUT	PRISM	
Sample Date:	August 28	3, 2020	249-0828				Technicia	an: <b>J. Har</b>	shman					
Project Name:	Deep War	rd Lake	Outlet Rep	air			Project Set N	o. <b>2</b>			Daily Se	t No. 2		
Project Number:	7122.748	44.01				:	Submitted to Lab	By: J. Hars	shman		Da	ite: <b>8</b>	3/31/2	.020
Client:	Surface C	reek Di	tch and Res	servoir		Te	esting Requested	By: Dan Q	uigley					
Concrete Supplier:	Whitew	ater Ma	terials Comp	bany		Truck	#: <b>9</b>		Ticket#:		001-	4153	00	
Mix Identification#:	C	18H Cla	ss D	Batch siz	e: <b>6</b>	cubic yards	Batch Tir	me: <b>92</b>	21a	Sar	nple Ti	me:	1140	)a
Time in Mixer	hou	urs <b>21</b>	minutes	Wa	iter Added Bef	fore Sampling:	0	gallons		Ambient A	Nir Tem	p. (°F.):	6	5
Maximum Size Aggre	egate:	3/4	inches		R	equired Streng	th: <b>4000</b>	psi at	28	days				
Sample Location:	STA 0+4	40 to 0+	65											
AREA/TYPE PLACEM	IENT:	X	CURB/GUTTER OTHER: <u>Pip</u>	e Casing	FLOOF	r slab	FO	OTING		WALL				
SAMPLING: (Fresh Concrete)	(Free	sh Concrete)	)	UNIT V X AS	WEIGHT: TM C138		AASHTO T121		CONCRET	E TEMPER C1064	ATURE	:	OTHE	R
ASTM C1019 Sampled From:	(Grout) ruck conveyo	r nozzle		-	142.6	Test Results	lb/ft ³ (LBF/cubid	c foot)		те <b>80</b>	est Resi	ults di	egrees	 F.
				SLUMP				<u> </u>	Num	ner of			og. 000	
ASTM C153	AST AAS Test Resu	FM C173 SHTO T196 Ilts	5	X	ASTM C143 ASTM C1611	Test Resu	SHTO T199		specimen Appro	s molded: oximate siz Cyli 6x	e of sp indrical 12"	ecimen :	o mold:	
5	5.1	%	(percent)		1.	75	in. (inche	es)	CUBE	PRIS	M		Other	
					LABORAT	ORY TEST D	ATA							
Specimens cured an	d tested in the	laboratory	in accordance	with:	Field cure X ASTM C31	ed and molded:	Cylir D T23 X AST	nders TM C39	Cubes ASTMC109	Drilled AS ⁻	d Cores FM C42	Sto X	orage Ta ASTM C	nks 511
	DATE			SPECIMEN ME	ASUREMENTS		COMPRES	SSIVE STRENG	GTH TEST DAT	A		САР ТҮР	E	
SPECIMEN IDENTIFICATION	TESTED YEAR: 2020	AGE IN	Diameter	Diameter	Average Diameter	Cross Sectional	Maximum LBF	PSI	FRACTURE TYPE # (See sketch	% of spec. achieved	C1231 NEO. PADS	C617 GYP. CAP	Other	TEST BY
9029	Aug. 21	DAYS	4.00	4 00	4.00	Area 12 57	E14E0	4110	below)	100 -	v			
9030	Sept 4	7	4.00	4.00	4.00	12.57	58780	4670	2	100+	x			ЛН
9031	Sept. 25	28	4.00	4.01	4.01	12.60	72570	5760	3	100+	X			SJ
9032	Sept. 25	28	4.01	4.00	4.01	12.60	71450	5670	2	100+	х			SJ
9033	Sept. 25	28	4.00	4.01	4.01	12.60	71740	5690	2	100+	х			SJ
		ļ												
			+											
AVERAGE	5710 PS	SI AT	<b>28</b> DAYS	AVERAGE		PSI AT	DAYS	AVEF	RAGE		PSI /	AT		DAYS
COMMENTS:						Field Cure C	Cylinders							
Type 1		Тур	ne 2	Type 3		E PATTERN TYP	Type 5		Type 6	Note: T occur w	ype 5 & 6 ith unbor	common nded caps	ly	

<b>*</b>	JWL				F	CONCRETE CYL		A - COMI	PRESSIV		NGTH	I ANA		S
	222 Montro	South Parlose, Colora	k Avenue do 81401			MASONRY GRO		MENT CUBE	CONCR	ETE PRISM		GROUT	PRISM	
Sample Date:	Septembe	er 2, 20	20				Technici	ian: <b>J. Har</b>	shman					
Project Name:	Deep War	d Lake	Outlet Rep	air			Project Set N	No. <b>3</b>			Daily Se	t No. <b>1</b>		
Project Number:	7122.748	44.01					Submitted to Lab	By: J. Har	shman		Da	te:	9/3/20	020
Client:	Surface C	reek Di	tch and Res	servoir		Τε	esting Requested	l By: Dan Q	uigley					
Concrete Supplier:	Whitew	ater Ma	terials Comp	any		Truck	#: 9		Ticket#:		001	-4155	0	
Mix Identification#:		C18H	,	Batch size	e: <u>6</u>	cubic yards	Batch T	ime: 92	:0a	Sar	nple Tii	me:	1128	3a
Time in Mixer	ho	urs <b>8</b>	minutes	Wat	ter Added Be	fore Sampling:	3	gallons		Ambient A	ir Tem	p. (°F.):	6	7
Maximum Size Aggre	egate:	3/4	inches		F	equired Streng	th: <b>4000</b>	psi at	28	days				
Sample Location:	STA 1+	70 Pad a	nd STA 1+4	0 to 1+30										
AREA/TYPE PLACEM	ENT:	X	CURB/GUTTER OTHER: <u>out</u> l	et works	FLOO	r slab	F	DOTING		WALL				
SAMPLING: (Fresh Concrete) X ASTM C172		sh Concrete) SHTO T14	1	UNIT W Xast	VEIGHT: TM C138	Toot Doculto	AASHTO T121		CONCRET	E TEMPER C1064		: ]	OTHE	R
Sampled From:	ruck conveyo	r nozzle			140.:	2	lb/ft ³ (LBF/cub	pic foot)		80	est Rest	d	egrees	F.
AIR-CONTENT:				SLUMP:					Num	per of			_	
ASTM C153 X ASTM C231		TM C173 SHTO T196 Ilts	5		ASTM C143 ASTM C1611		GHTO T199		specimen Appro	s molded: oximate siz Cyli	e of spe indrical 12"	ecimen	<b>5</b> mold:	
6	1	0/	(porcopt)	=		0	in (incl	200	CUBE	PRIS	М		Other	
0		/0		-			<u>п. (пс.</u>	103)						
					LABORAT	ORY TEST Di	AIA	indoso	Cubaa	Drillos	Caraa	C to		nko
Specimens cured and	d tested in the	laboratory	in accordance v	vith:	X ASTM C31			STM C39	ASTMC109	AST	TM C42	X	ASTM C	511
SPECIMEN IDENTIFICATION	DATE TESTED	AGE IN	Diameter	SPECIMEN MEA	ASUREMENTS	Cross Sectional	COMPR Maximu LBF	ESSIVE STRENG m Load PSI	FRACTURE TYPE # (See sketch	A % of spec.	C1231 NEO.	CAP TYP C617 GYP.	E Other	TEST BY
		DAYS	1	2	Diameter	Area			below)	achieved	FADS	CAF		
9038	Sept. 9	7	4.00	4.01	4.01	12.60	55360	4390	2	100+	X			21
9039	Sept. 30	28	4.01	4.01	4.01	12.03	53710	4270	3	100+	^			35
9041	Sept. 30	28												
9042	Sept. 30	28												
AVERAGE 4	<b>4330</b> P:	SI AT	7 DAYS	AVERAGE		PSI AT	<b>28</b> DAYS	AVE	RAGE		PSI A	AT		DAYS
COMMENTS:														
Type 1		Тур	e 2	<b>Type 3</b>	FRACTUR Ty	E PATTERN TYF pe 4	ES Type 5	_	Type 6	Note: T occur wi	ype 5 & 6 ith unbon	common Ided caps	ly	

<b>*</b>	JWL				F	CONCRETE CYL		A - COM	PRESSIV		NGTH	I ANA		S
	222 Montro	South Par ose, Colora	k Avenue do 81401			MASONRY GRO		MENT CUBE		ETE PRISM		GROUT	PRISM	
Sample Date:	Septembe	er 2, 20	249-0028 20				Technicia	an: <b>J. Har</b>	shman					
Project Name:	Deep War	d Lake	Outlet Rep	air			Project Set N	0. <b>3</b>			Daily Set	No. 1		
Project Number:	7122.748	44.01					Submitted to Lab	By: J. Hars	shman		Da	te:	9/3/20	020
Client:	Surface C	reek Di	tch and Res	servoir		Te	esting Requested	By: Dan Q	uigley					
Concrete Supplier:	Whitew	ater Ma	terials Comp	bany		Truck	#: 9		Ticket#:		001	-4155	0	
Mix Identification#:		C18H		Batch size	e: <u>6</u>	cubic yards	Batch Ti	me: <b>92</b>	0a	Sar	nple Tir	ne:	1128	Ba
Time in Mixer	hor	urs <b>8</b>	minutes	Wa	ter Added Bef	fore Sampling:	3	gallons		Ambient A	ir Tem	p. (°F.):	6	7
Maximum Size Aggre	egate:	3/4	inches		R	equired Streng	th: 4000	psi at	28	days				
Sample Location:	STA 1+	70 Pad a	nd STA 1+4	0 to 1+30										
AREA/TYPE PLACEM	ENT:	□ X	CURB/GUTTER OTHER: <u>out</u>	let works	FLOOF	r slab	FO	OTING		WALL				
SAMPLING: (Fresh Concrete) X ASTM C172 ASTM C1019	(Free AAS (Grout)	sh Concrete; SHTO T14		UNIT V Xast	VEIGHT: TM C138	Test Results	AASHTO T121		CONCRET X ASTM	E TEMPER C1064 Te	ATURE:	l	OTHE	R
Sampled From: ti	ruck conveyo	r nozzle			140.2	2	lb/ft ³ (LBF/cubi	c foot)		80		d	egrees	F.
AIR-CONTENT:				SLUMP	:				Num	oer of			-	
ASTM C153 X ASTM C231		TM C173 SHTO T196	5		ASTM C143 ASTM C1611		SHTO T199		Appro	s molded: oximate siz Cyli	e of spe ndrical	ecimen	<b>o</b> mold:	
6	1	9/	(porcopt)	-	1	0	in (inch	26)	CUBE	PRIS	М		Other	
		/0		-										
					LABURAT		AIA	adoro	Cubaa	Deillos	Coroo	Sta		nko
Specimens cured an	d tested in the	laboratory	in accordance	with:	X ASTM C31		T23 XAS	TM C39	ASTMC109	AST	TM C42	X	ASTM C	511
SPECIMEN IDENTIFICATION	DATE TESTED	AGE IN	Diameter	SPECIMEN ME	ASUREMENTS Average	Cross Sectional	COMPRE Maximun	SSIVE STRENG	FRACTURE	A % of spec.	( C1231 NEO.	CAP TYP C617 GYP.	E Other	TEST BY
	TLAR. 2020	DAYS	1	2	Diameter	Area	LUI	131	below)	achieved	PADS	CAP		
9038	Sept. 9	7	4.00	4.01	4.01	12.60	55360	4390	2	100+	х			SJ
9039	Sept. 9	7	4.01	4.01	4.01	12.63	53910	4270	3	100+	X			SJ
9040	Sept. 30	28	4.00	4.01	4.01	12.60	70810	5620	2	100+	X			21
9041	Sopt 20	20	4.00	4.01	4.01	12.00	70090	5500	2	100+	×			51
9042	Sept. 30	20	4.01	4.01	4.01	12.03	/1020	5620	3	100+	^			31
AVERAGE	<b>1330</b> PS	SI AT	7 DAYS	AVERAGE	5600	PSI AT	<b>28</b> _DAYS	AVE	RAGE		PSI A	AT		DAYS
Type 1		Тур	e 2	Type 3	FRACTUR	E PATTERN TYP	PES Type 5		Type 6	Note: T	ype 5 & 6 ith unbon	common ded caps	ly	

	JWL				F	CONCRETE CYL		TA - COM	PRESSIV		NGTH	HANA		S
	222 Montro	South Par se, Colora 970-	k Avenue do 81401 249-6828			MASONRY GRO	UT CUBE	CEMENT CUBE		ETE PRISM		GROUT	PRISM	
Sample Date:	Septembe	er 2, 20	20				Techn	cian: <b>J. Ha</b>	rshman					
Project Name:	Deep War	d Lake	Outlet Rep	air			Project Set	No. <u>3</u>			Daily Se	t No. 1		
Project Number:	7122.748	44.01				:	Submitted to L	ab By: J. Har	rshman		Da	ite:	9/3/20	020
Client:	Surface C	reek Di	tch and Re	servoir		Te	esting Request	ed By: Dan C	Quigley					
Concrete Supplier:	Whitewa	ater Ma	terials Comp	bany		Truck	#:	)	Ticket#:		001	-4155	50	
Mix Identification#:		C18H		Batch siz	e: 6	cubic yards	Batch	Time: 92	20a	Sar	nple Ti	me:	1128	3a
Time in Mixer	<b>2</b> hou	urs <b>8</b>	minutes	Wa	iter Added Bef	ore Sampling:	3	gallons		Ambient A	Nir Tem	p. (°F.):	6	7
Maximum Size Aggre	egate:	3/4	inches		R	equired Streng	th: 400	<b>D</b> psi at	28	days				
Sample Location:	STA 1+7	70 Pad a	ind STA 1+4	i0 to 1+30	)									
AREA/TYPE PLACEM	ENT:	X	CURB/GUTTER OTHER: <b>OUT</b>	let works	FLOOF	R SLAB		FOOTING		WALL				
SAMPLING: (Fresh Concrete)	(Fres	sh Concrete)	)	UNIT V	NEIGHT: TM C138		AASHTO T12		CONCRET X ASTM	E TEMPER C1064	ATURE	: ]	OTHE	R
ASTM C1019 Sampled From:	(Grout)	,110 114	I			Test Results				Te	est Resi	ults		
tr	ruck conveyor	r nozzle			140.2	2	lb/ft ³ (LBF/c	ubic foot)		80		d	egrees	<u>F.</u>
AIR-CONTENT:				SLUMP	:				Num	ber of			5	
ASTM C153	AST	M C173		Х	ASTM C143	AA	бнто т199		Appro	ximate siz	e of sp	ecimen	mold:	—
X ASTM C231	AAS	SHTO T19	ċ		ASTM C1611					Cyli	indrical	: 		
	Test Resu	lts				Test Resu	llts		X 4x8" CUBE	PRIS	12" М		Other	
6	.4	%	(percent)		4	.0	in. (ir	ches)						
					LABORAT	ORY TEST D	ATA							
Specimens cured and	d tested in the	laboratory	in accordance	with:	Field cure	and molded:	) T23 X	Cylinders ASTM C39	Cubes ASTMC109	Drilled AS	d Cores FM C42	Sto X	orage Ta ASTM C	nks 511
SDECIMEN	DATE	ACE		SPECIMEN ME	ASUREMENTS		COM	RESSIVE STREN	GTH TEST DAT	A	C1231	CAP TYP C617	E	TEST
IDENTIFICATION	YEAR: 2020	IN DAYS	Diameter 1	Diameter 2	Average Diameter	Cross Sectional	LBF	PSI	TYPE # (See sketch	% of spec. achieved	NEO. PADS	GYP. CAP	Other	BY
9043	Sept. 9	7	4.00	4.01	4.01	12.60	49060	3890	2	97.3	х			SJ
9044	Sept. 9	7	4.00	4.01	4.01	12.60	45890	3640	2	91.0	х			SJ
9045	Sept. 30	28	4.01	4.01	4.01	12.63	56330	4460	2	100+	х			SJ
9046	Sept. 30	28	4.01	4.01	4.01	12.63	56260	4450	2	100+	Х			SJ
9047	Sept. 30	28	4.01	4.01	4.01	12.63	53170	4210	5	100+	Х			SJ
AVERAGE	<b>3770</b> PS	SI AT	7 DAYS	AVERAGE	4370	PSI AT	<b>28</b> DA	YS AVE	RAGE		PSI /	AT		DAYS
COMMENTS:						Field Cure C	ylinders							
Type 1		Тур	ie 2	Type 3		E PATTERN TYF	vES Type 5		Type 6	Note: T	ype 5 & 6 ith unbor	common nded caps	ly	

<b>*</b>	JWL	WWW/110	WILZOM!		F	CONCRETE CYL	B TEST D	ATA - CON Masonry gro	IPRESSIV		NGTH	I ANA	LYSI	S
	222 Montro	South Par ose, Colora 970-	k Avenue do 81401 249-6828			MASONRY GRO	UT CUBE	CEMENT CUBE		ETE PRISM		GROUT	PRISM	
Sample Date:	Septembe	er 11, 2	020				Tech	nician: <b>J. Ha</b>	rshman					
Project Name:	Deep War	d Lake	Outlet Rep	bair			Project Se	et No. 5			Daily Se	t No. <b>1</b>		
Project Number:	7122.748	44.01					Submitted to	Lab By: J. Ha	rshman		Da	te: 9	/12/2	2020
Client:	Surface C	reek Di	tch and Re	servoir		Te	esting Reque	sted By: Dan (	Quigley					
Concrete Supplier:	Whitew	ater Ma	terials Com	pany		Truck	#:	9	Ticket#:		001-	4157	45	
Mix Identification#:		C18H		Batch siz	e: <b>6</b>	cubic yards	Batc	h Time: 9	51a	Sar	nple Tii	me:	1227	7р
Time in Mixer	hor	urs <u>31</u>	minutes	Wa	ter Added Bef	ore Sampling:	0	gallons		Ambient A	Air Tem	p. (°F.):	5	8
Maximum Size Aggr	egate:	3/4	inches		R	equired Streng	th: <b>40</b>	DO psi a	28	days				
Sample Location:	Outlet v	ving wa	lls											
AREA/TYPE PLACEN	ENT:	X	CURB/GUTTER OTHER: <u>out</u>	let works	FLOOF walls	R SLAB		FOOTING		WALL				
SAMPLING: (Fresh Concrete)	(Free	sh Concrete) SHTO T14	) 1	UNIT \ Xas	NEIGHT: TM C138		AASHTO T12	21	CONCRET X ASTM	E TEMPER C1064	ATURE	]	OTHE	R
ASTM C1019	(Grout)			_		Test Results				Te	est Resu	ults		
	truck			_	142.4	4	lb/ft3 (LBF/	cubic foot)		60		d	egrees	F
AIR-CONTENT				SLUMP					Num	per of				
ASTM C153	AST AAS Test Resu	FM C173 SHTO T196 Its	6		ASTM C143 ASTM C1611	Test Resu	SHTO T199 Its		specimen Appro	s molded: eximate siz Cyli Cyli 6x	e of spe indrical 12"	ecimen	5 mold:	
5	.8	%	(percent)		4.	75	in. (	inches)					otrici	
				•	LABORAT	ORY TEST D	ATA							
Specimens cured an	d tested in the	laboratory	in accordance	with:	Field cure X ASTM C31	ed and molded:	) T23 X	Cylinders ASTM C39	Cubes ASTMC109	Drilleo	d Cores TM C42	Sto X	rage Ta ASTM C	nks 511
	DATE			SPECIMEN ME	ASUREMENTS		CON	IPRESSIVE STREM	IGTH TEST DAT	A	(	CAP TYP	Е	
SPECIMEN IDENTIFICATION	TESTED YEAR: 2020	AGE IN DAYS	Diameter 1	Diameter 2	Average Diameter	Cross Sectional Area	Maxi LBF	mum Load PSI	FRACTURE TYPE # (See sketch below)	% of spec. achieved	NEO. PADS	GYP. CAP	Other	TEST BY
9052	Sept. 18	7	4.00	4.01	4.01	12.60	55330	4390	2	100+	х			SJ
9053	Oct. 9	28	3.99	4.00	4.00	12.54	75020	5980	3	100+	х			SJ
9054	Oct. 9	28	4.00	4.01	4.01	12.60	70720	5610	5	100+	х			SJ
9055	Oct. 9	28	4.00	4.00	4.00	12.57	74480	5930	5	100+	х			SJ
9056	н	н	Tossed											SJ
AVERAGE	5 <b>840</b> PS	SI AT	<b>28</b> DAYS	AVERAGE		PSI AT	D	ays avi	ERAGE		_ PSI #	АТ		DAYS
					FRACTUR	E PATTERN TYF	PES							
Type 1		Typ	be 2	Type 3	Ty	be 4	Туре	5	Type 6	Note: T	ype 5 & 6 ith unbon	common ded caps	ly	

7122.74844.01 Deep Ward Lake Field Data .xlsx CST9.11.20jlh#5-9052

	JWL	WWWW 120	WE COM		F	CONCRETE CYL	B TEST		ONRY GROUT	PRESSIV		NGTH	I ANA	<b>LYSI</b>	S	
	222 Montro	South Par se, Colora 970-	k Avenue do 81401 249-6828			MASONRY GRO	UT CUBE	СЕМ	ENT CUBE	CONCR	ETE PRISM		GROUT	PRISM		
Sample Date:	Septembe	er 11, 2	020				Те	chnicia	n: <b>J. Har</b>	shman						
Project Name:	Deep War	d Lake	Outlet Rep	air			Project	t Set No	). <b>5a</b>			Daily Se	t No. 2			
Project Number:	7122.748	44.01					Submitted to Lab By: J. Harshman Date: 9/12/202							2020		
Client:	Surface C	reek Di	tch and Re	servoir		Те	esting Re	quested E	By: Dan Q	uigley						
Concrete Supplier:	Whitew	ater Ma	terials Com	bany		Truck	#:	9		Ticket#:		001-	4157	45		
Mix Identification#:		C18H		Batch siz	e: <b>6</b>	cubic yards	I	Batch Tim	ne: <b>95</b>	1a	Sar	nple Tii	me:	1227	7р	
Time in Mixer	hou	urs <u>31</u>	minutes	Wa	iter Added Bef	fore Sampling:		0	gallons		Ambient A	ir Tem	p. (°F.):	5	8	
Maximum Size Aggre	egate:	3/4	inches		R	equired Streng	Ith:	4000	psi at	28	days					
Sample Location:	Outlet v	ving wa	lls													
AREA/TYPE PLACEM	ENT:	X	CURB/GUTTER OTHER: <u>out</u>	let works	FLOOF walls	r slab		FOC	DTING		WALL					
SAMPLING: (Fresh Concrete)	(Free AAS	sh Concrete) SHTO T14	1		WEIGHT: TM C138		AASHTO	T121		CONCRET X ASTM	E TEMPER C1064	ATURE	: ]	OTHE	R	
ASTM C1019 Sampled From:	(Grout) truck			Test Results 142.4Ib/ft³ (LBF/cubi					foot)		 60	est Resu	ults d	earees		
				SI LIMD.						Num	por of			og. 000		
ASTM C153	AST AAS Test Resu	TM C173 SHTO T196 Its	ò	X	ASTM C143 ASTM C1611	Test Resu	AASHTO T199 A				cimens molded:         5           Approximate size of specimen mold:         Cylindrical:           4x8"         6x12"					
5	.8	%	(percent)	4.75 in (inches)					PRIS	М	Other					
					LABORAT	ORY TEST D	ΑΤΑ									
Specimens cured an	d tested in the	laboratory	in accordance	with:	Field cure X ASTM C31	ed and molded:	D T23	Cyline X ASTI	ders M C39	Cubes ASTMC109	Drilleo	d Cores FM C42	Sto X	rage Ta ASTM C	nks 511	
	DATE			SPECIMEN ME	ASUREMENTS			COMPRES	SIVE STRENG	TH TEST DAT	A	(	САР ТҮР	E		
SPECIMEN IDENTIFICATION	TESTED YEAR: 2020	AGE IN DAYS	Diameter 1	Diameter 2	Average Diameter	Cross Sectional Area	LE	Maximum BF	Load PSI	FRACTURE TYPE # (See sketch below)	% of spec.	C1231 NEO. PADS	C617 GYP. CAP	Other	TEST BY	
9076	Sept. 18	7	4.01	4.01	4.01	12.63	545	500	4320	2	100+	х			JLH	
9077	Oct. 9	28	4.00	4.00	4.00	12.57	687	750	5470	2	100+	х			SJ	
9078	Oct. 9	28	4.01	3.99	4.00	12.57	680	070	5420	2	100+	х			SJ	
9079	Oct. 9	28	4.01	4.00	4.01	12.60	678	320	5380	2	100+	х			SJ	
9080	Н	Н	Tossed												SJ	
AVERAGE	5 <b>420</b> PS	SI AT	<b>28</b> DAYS	AVERAGE		PSI AT		_DAYS	AVEF	RAGE		PSI A	AT		DAYS	
COMMENTS:						Field Cure C	ylinder	s								
Type 1		Тур	ne 2	Type 3	FRACTUR	E PATTERN TYF	PES Ty	ype 5	,	Type 6	Note: T occur wi	ype 5 & 6 ith unbon	common Ided caps	ly		

7122.74844.01 Deep Ward Lake Field Data .xlsx CST9.11.20jlh#5a-9076

<b>*</b>	JWL		VI SAMI		F	CONCRETE CYL		ATA - CON MASONRY GRO	<b>IPRESSIV</b>		NGTH	I ANA	<b>LYSI</b>	s	
	222 Montre	South Par ose, Colora 970-	k Avenue do 81401 249-6828			MASONRY GRO	UT CUBE	CEMENT CUBE		RETE PRISM		GROUT	PRISM		
Sample Date:	Septembe	er 18, 2	020				Techn	iician: <b>J. Ha</b>	arshman						
Project Name:	Deep War	rd Lake	Outlet Rep	air		Project Set No. <u>6</u> Daily Set No. <u>1</u>									
Project Number:	7122.748	44.01				Submitted to Lab By: J. Harshman						te: 🤦	9/21/2	2020	
Client:	Surface C	reek Di	tch and Re	servoir		Te	esting Reques	ted By: Dan	Quigley						
Concrete Supplier:	Whitew	ater Ma	terials Com	bany		Truck	#:1	8	Ticket#:		001-416120				
Mix Identification#:				Batch siz	e: <b>7.5</b>	cubic yards	Batch	n Time: 8	45a	Sar	mple Ti	me:	1110	Эа	
Time in Mixer	ho	urs <b>16</b>	minutes	Wa	ter Added Bef	fore Sampling:	7	gallons		Ambient A	Air Tem	p. (°F.):	5	8	
Maximum Size Aggr	egate:	3/4	1inches		R	equired Streng	oth: 400	<b>10</b> psi a	it <b>28</b>	days					
Sample Location:	Inlet St	ructure													
AREA/TYPE PLACEN	MENT:		CURB/GUTTER		FLOOP	r slab		FOOTING		WALL					
SAMPLING:					VEIGHT:				CONCRET	E TEMPER	ATURE	:	OTHE	R	
(Fresh Concrete) (Fresh Concrete)			XAS	TM C138		AASHTO T12	1	XASTM	C1064		]				
X ASTM C172	ISTM C172 AASHTO T141														
ASTM C1019 Sampled From:	(Grout)					Test Results				T	est Resi	ults			
	truck convey	or belt			142.2	2	lb/ft ³ (LBF/c	cubic foot)		66		d	egrees	F.	
AIR-CONTENT:				SLUMF	:				Num	ber of					
ASTM C153 ASTM C173				X	ASTM 0142				specimer	ns molded:			5 mald:		
				ASTM C143		50101199		Cylindrical:							
	Test Resu	ilts				Test Resu	ilts	-	X 4x8"	6x	12"				
é	5.0	%	(percent)		2.	2.75 in. (inches)				PRIS	М		Other		
			()		LABORAT	ORY TEST D	ATA	<u></u>				<u> </u>			
Specimens cured an	nd tested in the	laboratory	in accordance	with:	Field cure X ASTM C31	ed and molded:	о т23 X	Cylinders ASTM C39	Cubes	Drille	d Cores TM C42	Sto X	rage Ta ASTM C	inks 2511	
	DATE	,					COM	PRESSIVE STREE	NGTH TEST DAT	TA		САР ТҮР	E		
SPECIMEN	TESTED	AGE		SPECTIVIEN IVIE	ASUREIMENTS		Maxir	num Load	FRACTURE	% of	C1231	C617	Other	TEST BY	
IDENTIFICATION	YEAR: 2020	IN DAYS	Diameter 1	Diameter 2	Average Diameter	Cross Sectional Area	LBF	PSI	(See sketch below)	spec. achieved	NEO. PADS	GYP. CAP	Uther	DI	
9061	Sept. 28	10	4.00	4.00	4.00	12.57	63750	5070	2	100+	х			SJ	
9062	Oct. 19	31	4.00	4.01	4.01	12.60	70230	5570	) 5	100+	х			SJ	
9063	Oct. 19	31	4.01	4.01	4.01	12.63	72710	5760	2	100+	х			SJ	
9064	Oct. 19	31	4.01	4.01	4.01	12.63	76010	6020	) 2	100+	х			SJ	
9065	Oct. 19	н	Tossed											SJ	
														<b> </b>	
AVERAGE	<b>5780</b> P:	SI AT	<u>28</u> DAYS	AVERAGE		PSI AT	DA	AV AV	ERAGE		PSI /	AT		DAYS	
					FRACTUR	E PATTERN TYF	PES								
Type 1	71	Typ	e 2   { } { ]	Type 3	Туј	pe 4	Type 5	;	Type 6	Notes			lv.		
	, **** ***	$\left  \right\rangle$	Ľ۷							Note: T occur w	ype 5 & 6 ith unbor	ded caps			

7122.74844.01 Deep Ward Lake Field Data .xlsx CST9.18.20jlh#6-9061

<b>*</b>	JWL	1000000114240	WILCOM!		F	<b>IELD / LAI</b>	B TEST		- COMI	PRESSIV		NGTH	I ANA	<b>LYSI</b> ER	s	
	222 Montro	South Parl ose, Colora 970-	k Avenue do 81401 249-6828			MASONRY GRO	UT CUBE	СЕМЕ	ENT CUBE	CONCR	ETE PRISM		GROUT	PRISM		
Sample Date:	Septembe	er 18, 20	020				Τe	chniciar	n: <b>J. Har</b>	shman						
Project Name:	Deep Wa	rd Lake	Outlet Rep	air	Project Set No. 7 Daily Set No. 2											
Project Number:	7122.748	44.01				9	- Submitte	d to Lab B	y: J. Har	shman		Date: 9/21/2020				
Client:	Surface C	reek Di	tch and Res	servoir		Te	esting Re	quested B	y: Dan Q	uigley						
Concrete Supplier:	Whitew	ater Ma	terials Comp	bany		Truck	#:	18		Ticket#:		001-416120				
Mix Identification#:				Batch siz	e: 7.5	cubic yards		Batch Tim	e: <b>84</b>	5a	Sar	nple Tii	me:	1110	)a	
Time in Mixer	ho	urs <u>16</u>	minutes	Wa	ter Added Bef	ore Sampling:		7	gallons		Ambient A	ir Tem	p. (°F.):	5	8	
Maximum Size Aggre	egate:	3/4	inches		R	equired Streng	th:	4000	psi at	28	days					
Sample Location:	Inlet St	ructure														
AREA/TYPE PLACEM	ENT:		CURB/GUTTER		FLOOF	R SLAB		FOO	TING		WALL					
SAMPLING: (Fresh Concrete) XASTM C172 AASHTO T141				UNIT V Xas	VEIGHT: TM C138		AASHTO	T121		CONCRET	E TEMPER C1064	ATURE	:	OTHE	R	
ASTM C1019 Sampled From:	(Grout)			Test Results						Te	est Resu	ults				
	truck convey	or belt			I42.2Ib/tt³ (LBF/cubic toot)						66		d	egrees	F	
AIR-CONTENT:				SLUMP	:					Numl specimen	per of s molded:		1	5		
ASTM C153	AS	TM C173		Х	ASTM C143	AAS	бНТО Т1	99		Appro	ximate siz	e of spe	ecimen	mold:		
X ASTM C231	AA	SHTO T196	5		ASTM C1611						Cyl	ndrical	-			
	Test Resu	ilts			Test Results					X 4x8" CUBE	6x PRIS	12" м		Other		
6	0.0	%	(percent)		2.	75	i	in. (inches	5)							
					LABORAT	ORY TEST D	ATA									
					Field cure	d and molded:		Cylind	lers	Cubes	Drilleo	l Cores	Sto	rage Ta	nks	
Specimens cured an	d tested in the	laboratory	in accordance	with:	X ASTM C31	AASHTC	) T23	X ASTN	/I C39	ASTMC109	AS	FM C42	Х	ASTM C	511	
SPECIMEN	DATE	AGE		SPECIMEN ME	ECIMEN MEASUREMENTS					GTH TEST DAT	TA         CAP TYPE           C1231         C617					
IDENTIFICATION	YEAR: 2020	IN DAYS	Diameter 1	Diameter 2	Average Diameter	Cross Sectional Area	LI	BF	PSI	FRACTURE TYPE # (See sketch below)	% Of spec. achieved	NEO. PADS	GYP. CAP	Other	BY	
9066	Sept. 28	10	4.01	4.00	4.01	12.60	618	380	4910	2	100+	х			SJ	
9067	Oct. 19	31	4.00	4.01	4.01	12.60	693	370	5510	2	100+	х			SJ	
9068	Oct. 19	31	4.01	4.01	4.01	12.63	635	550	5030	2	100+	Х			SJ	
9069	Oct. 19	31	4.00	4.00	4.00	12.57	647	790	5160	2	100+	Х			SJ	
9070	Н	Н													SJ	
AVERAGE	5 <b>230</b> P	SI AT	28 DAYS	AVERAGE		PSI AT		DAYS	AVE	RAGE		PSI A	AT		DAYS	
COMMENTS:						Field Cure C	ylinder	s								
					FRACTURI	E PATTERN TYP	ES									
Type 1		Тур	e 2	Type 3	Typ	be 4	T)	ype 5		Type 6	Note: T	ype 5 & 6 ith unbon	common Ided caps	ly		

7122.74844.01 Deep Ward Lake Field Data .xlsx CST9.18.20jlh#7-9066FC

### APPENDIX D

### DOWL FIELD OBSERVATION REPORTS



## **FIELD OBSERVATION REPORT**

DATE

08/17/20

S M T W TH F S

222 South Park Avenue Montrose, Colorado 81401 970-249-6828

		DAY		X		
Project Name Deep Ward Lake Dam Seepage Repair		Bright Sun	Clear	Overcast	Rain	Snow
Project Number 7122.74844.01	WEATHER		Χ			
		To 32	32-50	50-70	70-85	85 up
Client Surface Creek Ditch and Reservoir Company	TEMP			Х		
Client Rep. Keith Waibel		Still	Moderate	High	Re	port No.
	WIND	Χ				
Contractor Con-Sy		Dry	Moderate	Humid		1
Contractor Rep.	HUMIDITY	Χ				

CONSTRUCTION ACTIVITIES:

On-site at 8:00am. Took one density in embankment fill at 12". Left site at 8:38am.

Returned to site at 10:10am. Observed HB QC tests. Both passed moisture and density. Left site at 10:40am.

Returned to site again at 2:30pm. Took two moisture density tests at bottom of outlet. Pipe works concrete encased.

Nuclear Density indicated 9.

#### Page 1 of 1

BY: Jeramy Harshman

### TITLE: Materials Testing Technician

Number of site vis	sits today:					
	800a		830a			
ARRIVAL TIME	1010a	DEPARTURE TIME	1040a	TRAVEL	MILEAGE	_
	230p		300p			
7122.74844.01 De	eep Ward Lak	<u>ke Field Data .xlsx FOR8.</u>	7.20ilh#1			



# **FIELD OBSERVATION REPORT**

DATE 08/24/20

222 South Park Avenue Montrose, Colorado 81401 970-249-6828

			S M	ΤW	TH F	S
		DAY		X		
Project Name Deep Ward Lake Dam Seepage Repair		Bright Sun	Clear	Overcast	Rain	Snow
Project Number 7122.74844.01	WEATHER		Χ			
		To 32	32-50	50-70	70-85	85 up
Client Surface Creek Ditch and Reservoir Company	TEMP			X		
Client Rep. Keith Waibel		Still	Moderate	High	Re	port No.
	WIND	Χ				
Contractor Con-Sy		Dry	Moderate	Humid		2
Contractor Rep.	HUMIDITY	Χ				

CONSTRUCTION ACTIVITIES:

On-site at 12:45pm for observation of placement of 180N Mirafi Geo Fabric for inlet drain gravel.

#### Page 1 of 1

Jeramy Harshman BY:

#### Materials Testing Technician TITLE:

Number of site visits tod	ay:				
ARRIVAL TIME 124	5p DEPARTURE TIME	145p	TRAVEL	MILEAGE	

7122.74844.01 Deep Ward Lake Field Data .xisx FOR8.24.20Jin#2



# FIELD OBSERVATION REPORT

DATE

08/28/20

S M T W TH F S

222 South Park Avenue
Montrose, Colorado 81401
970-249-6828

		DAY			X	
Project Name Deep Ward Lake Dam Seepage Repair		Bright Sun	Clear	Overcast	Rain	Snow
Project Number 7122.74844.01	WEATHER			Х		
		To 32	32-50	50-70	70-85	85 up
Client Surface Creek Ditch and Reservoir Company	TEMP			Χ		
Client Rep. Keith Waibel		Still	Moderate	High	Re	port No.
	WIND	Χ				
Contractor Con-Sy		Dry	Moderate	Humid		3
Contractor Rep.	HUMIDITY	Χ				

CONSTRUCTION ACTIVITIES:

On-site at 10:45am, as scheduled, to sample and test fresh concrete. Dan Quigley on-site to observe pour and final rebar inspection.

Took sample from end of conveyor belt at point of placement. Tested slump, unit weight, air content, concrete temperature and made two sets of five cylinders (one set for field cures).

Concrete materials tested indicated conformance to project specifications. Compressive strength conformance is pending the curing schedule.

Concrete placed in sections at STA 0+40 to 0+65.

#### Page 1 of 1

Jeramy Harshman BY:

#### Materials Testing Technician TITLE:

Number of site vis	its today:						
ARRIVAL TIME	1045a	DEPARTURE TIME	1245p	TRAVEL	1	MILEAGE	

Ward Lake Field Data .xisx FUR8.28.20jin#3


DATE

09/02/20

S M T W TH F S

222 South Park Avenue
Montrose, Colorado 81401
970-249-6828

		DAY		X		
Project Name Deep Ward Lake Dam Seepage Repair		Bright Sun	Clear	Overcast	Rain	Snow
Project Number 7122.74844.01	WEATHER		Χ			
		To 32	32-50	50-70	70-85	85 up
Client Surface Creek Ditch and Reservoir Company	TEMP			Х		
Client Rep. Keith Waibel		Still	Moderate	High	Re	port No.
	WIND	Χ				
Contractor Con-Sy		Dry	Moderate	Humid		4
Contractor Rep.	HUMIDITY	Χ				

CONSTRUCTION ACTIVITIES:

On-site at 10:45am, as scheduled, to observe concrete placement for outlet works.

Contractor ordered 30 cubic yards of Class D placed at STA 0+20 to 0+40, STA 0+65 to 0+90 and STA 115 to 140.

After addition of 3 gallons water, I sampled and tested first batch on site. Concrete materials tested indicated conformance to project specifications.

Observed placement of all four trucks batched.

Contractor added water to each truck: second truck +10 gallons - visual slump ~3" third truck +14 gallons - visual slump ~2" fourth truck +13 gallons - visual slump ~3"

#### Page 1 of 1

Jeramy Harshman BY:

#### Materials Testing Technician TITLE:

Number of site visits to	oday:					
ARRIVAL TIME 10	D45a DEPARTURE TIME	130p	TRAVEL	1	MILEAGE	

ward lake field Data .xisx for9.2.20jin#



DATE

09/11/20

222 South Park Avenue
Montrose, Colorado 81401
970-249-6828

		1	c	N/	т	147	тп	г	c	
		DAY	3	IVI	I	vv		<b>X</b>	3	
Project Name Deep Ward Lake Dam Seepage Repair		Bright Sun	Clea	ır	Over	cast	Ra	in	Sr	างพ
Project Number 7122.74844.01	WEATHER									
		To 32	32-5	0	50-	70	70-	85	85	o up
Client Surface Creek Ditch and Reservoir Company	TEMP									
Client Rep. Keith Waibel		Still	Moder	ate	Hi	gh		Rep	ort No.	
	WIND									
Contractor <u>Con-Sy</u>		Dry	Moder	ate	Hur	mid			5	
Contractor Rep.	HUMIDITY									

CONSTRUCTION ACTIVITIES:

On-site to sample and test concrete placed for outlet wing walls.

Sampled and tested concrete for slump, unit weight, air content, concrete temperature and made two sets of five cylinders (one set for Field Cures) for compressive strength testing.

#### Page 1 of 1

BY: Jeramy Harshman

Number of site vis	sits today:						
ARRIVAL TIME	1135a	DEPARTURE TIME	110p	TRAVEL	3.5	MILEAGE	
7122.74844.01 De	eep Ward Lak	e Field Data .xlsx FOR9.1	1.20jlh#5				



DATE

09/18/20

S M T W TH F S

222 South Park Avenue Montrose, Colorado 81401 970-249-6828

		DAY			X	
Project Name Deep Ward Lake Dam Seepage Repair		Bright Sun	Clear	Overcast	Rain	Snow
Project Number 7122.74844.01	WEATHER			РС		
		To 32	32-50	50-70	70-85	85 up
Client Surface Creek Ditch and Reservoir Company	TEMP			Х		
Client Rep. Keith Waibel		Still	Moderate	High	Rep	oort No.
	WIND	Х				
Contractor Con-Sy		Dry	Moderate	Humid		6
Contractor Rep. Wayne Boulderston	HUMIDITY	Χ				

CONSTRUCTION ACTIVITIES:

On-site at 10:35am to sample and test concrete placed for inlet structure.

Tested first batch on-site for slump, unit weight, air content, concrete temperature and made two sets of five cylinders (one set for Field Cures) for compressive strength testing.

Also tested moisture density on embankment fill. One on each side of outlet works pipe concrete encasement. Both tests indicated conformance to project specifications.

#### Page 1 of 1

BY: Jeramy Harshman

Number of site vis	sits today:					
ARRIVAL TIME	1035a	DEPARTURE TIME	1240p	TRAVEL	MILEAGE	
	eep Ward Lak	e Field Data .xlsx FOR9.1	8.20ilh#6			



DATE 09/23/20

222 South Park Avenue Montrose, Colorado 81401 970-249-6828

010 210 0020										
			S	М	Т	W	TH	F	S	
		DAY				Χ				
Project Name Deep Ward Lake Dam Seepage Repair		Bright Sun	Clea	r	Overc	ast	Ra	in	Sno	w
Project Number 7122.74844.01	WEATHER		Χ				<u> </u>			
		To 32	32-5	0	50-7	'0	70-	·85	85 u	ıp
Client Surface Creek Ditch and Reservoir Company	TEMP				Х		<u> </u>			
Client Rep. Keith Waibel		Still	Modera	ate	Hig	h	<u> </u>	Rep	oort No.	
	WIND	Х								
Contractor Con-Sy		Dry	Modera	ate	Hum	id			7	
Contractor Rep. <u>Wayne Boulderston</u>	HUMIDITY	Χ					L			
CONSTRUCTION ACTIVITIES:										

On-site at 8:00am.

Observed fill placement around inlet structure. Contractor placing ~ 8" lifts and compacting with walk behind sheepsfoot and jumping jack.

### Page 1 of 1

BY: Jeramy Harshman

Number of site visits today:				
ARRIVAL TIME	DEPARTURE TIME	TRAVEL	MILEAGE	
7122.74844.01 Deep Ward L	ake Field Data .xlsx FOR9.23.20jlh	#7		



09/24/20

DATE

222 South Park Avenue	
Montrose, Colorado 81401	
970-249-6828	

			S M	ΤW	TH F	S
		DAY			Χ	
Project Name Deep Ward Lake Dam Seepage Repair		Bright Sun	Clear	Overcast	Rain	Snow
Project Number 7122.74844.01	WEATHER		Χ			
		To 32	32-50	50-70	70-85	85 up
Client Surface Creek Ditch and Reservoir Company	TEMP			Х		
Client Rep. Keith Waibel		Still	Moderate	High	Re	port No.
	WIND	X				
Contractor Con-Sy		Dry	Moderate	Humid		8
Contractor Rep. Wayne Boulderston	HUMIDITY	X				

CONSTRUCTION ACTIVITIES:

Took one density test in compacted embankment.

Also observed placement of sand diaphragm placed from 10.100' to 10,105'.

### Page 1 of 1

BY: Jeramy Harshman

Number of site visits today:				
ARRIVAL TIME	DEPARTURE TIME	TRAVEL	MILEAGE	_
7122.74844.01 Deep Ward Lake	e Field Data .xlsx FOR9.24.20jlh;	#8		



DATE 09/29/20

222 South Park Avenue Montrose, Colorado 81401 970-249-6828

010 210 0020										
			S	М	Т	W	TH	F	S	
		DAY			Χ					
Project Name Deep Ward Lake Dam Seepage Repair		Bright Sun	Clea	ar	Overca	ast	Rai	in	Snov	W
Project Number 7122.74844.01	WEATHER		Х	,						
		To 32	32-5	50	50-70	о	70-	85	85 u	р
Client Surface Creek Ditch and Reservoir Company	TEMP				Χ					
Client Rep. Keith Waibel		Still	Moder	rate	High	,		Rep	ort No.	
	WIND	Χ								
Contractor Con-Sy		Dry	Moder	rate	Humi	d			9	
Contractor Rep. <u>Wayne Boulderston</u>	HUMIDITY	Χ								
CONSTRUCTION ACTIVITIES:										

On-site at 9:30am.

Tested moisture density. Roller down at 12:00pm due to bolts holding sheepsfoot on are broken.

### Page 1 of 1

BY: Jeramy Harshman

Number of site visits toda	y:			
ARRIVAL TIME	DEPARTURE TIME	TRAVEL	MILEAGE	
7122.74844.01 Deep War	d Lake Field Data .xlsx FOR9.29.20jlh	#9		



DATE 09/30/20

222 South Park Avenue
Montrose, Colorado 81401
970-249-6828

570-245-0020						
			S M	ΤV	V TH F	S
		DAY			(	
Project Name Deep Ward Lake Dam Seepage Repair		Bright Sun	Clear	Overca	st Rain	Snow
Project Number 7122.74844.01	WEATHER		Х			
		To 32	32-50	50-70	70-85	85 up
Client Surface Creek Ditch and Reservoir Company	TEMP			X		
Client Rep. Keith Waibel		Still	Moderate	High	R	eport No.
	WIND	Χ				
Contractor Con-Sy		Dry	Moderate	Humic		10
Contractor Rep. Wayne Boulderston	HUMIDITY	X				

CONSTRUCTION ACTIVITIES:

Roller fixed. Previous lift was rerolled and moisture density tests passed.

### Page 1 of 1

BY: Jeramy Harshman

Number of site visits toda	ау:			
ARRIVAL TIME	DEPARTURE TIME	TRAVEL	MILEAGE	
7122.74844.01 Deep Wa	rd Lake Field Data .xlsx FOR9.30.20jlh	#10		



DATE

10/01/20

222 South Park Avenue Montrose, Colorado 81401 970-249-6828

			S M	ΤW	TH F	S
		DAY			X	
Project Name Deep Ward Lake Dam Seepage Repair		Bright Sun	Clear	Overcast	Rain	Snow
Project Number 7122.74844.01	WEATHER		Χ			
		To 32	32-50	50-70	70-85	85 up
Client Surface Creek Ditch and Reservoir Company	TEMP			X		
Client Rep. Keith Waibel		Still	Moderate	High	R	eport No.
	WIND	Х				
Contractor Con-Sy		Dry	Moderate	Humid		11
Contractor Rep. <u>Wayne Boulderston</u>	HUMIDITY	Χ				

CONSTRUCTION ACTIVITIES:

On-site for observation of installed final 4.5' of sand diaphragm.

Previous lift of sand uncovered and cleared to  $\sim$ 3" below Mirafi Fabric cover. Sand is clean and ready for added filter sand.

Observed placement of sand/watering and compaction with 2 passes of v. plate.

Contractor will complete final lift on Friday.

#### Page 1 of 1

BY: Jeramy Harshman

Number of site vis	its today:					
ARRIVAL TIME	800a	DEPARTURE TIME	500p	TRAVEL	MILEAGE	_
7122.74844.01 De	ep Ward Lal	ke Field Data .xlsx FOR10.	1.20jlh#11			



DATE

10/05/20

S M T W TH F S

222 South Park Avenue Montrose, Colorado 81401 970-249-6828

		DAY	X			
Project Name Deep Ward Lake Dam Seepage Repair		Bright Sun	Clear	Overcast	Rain	Snow
Project Number 7122.74844.01	WEATHER		Х			
		To 32	32-50	50-70	70-85	85 up
Client Surface Creek Ditch and Reservoir Company	TEMP			Х		
Client Rep. Keith Waibel		Still	Moderate	High	Rej	oort No.
	WIND	Χ				
Contractor Con-Sy		Dry	Moderate	Humid	12	
Contractor Rep. Wayne Boulderston	HUMIDITY	Χ				
CONSTRUCTION ACTIVITIES:						

No fill placement today. Dozer operator not on-site. Contractor is screening native soil and stockpiling.

### Page 1 of 1

BY: Jeramy Harshman

Number of site visi	its today:						
ARRIVAL TIME	100a	DEPARTURE TIME	1020a	TRAVEL	3	MILEAGE	-
7122.74844.01 De	ep Ward Lak	e Field Data .xlsx FOR10	.5.20jlh#12				



DATE 10/06/20

222 South Park Avenue Montrose, Colorado 81401 970-249-6828

			S M	ΤV	N	TH	F	S	
		DAY		X					
Project Name Deep Ward Lake Dam Seepage Repair		Bright Sun	Clear	Overca	st	Rain	1	Sno	w
Project Number 7122.74844.01	WEATHER		Χ						
		To 32	32-50	50-70	)	70-8!	5	85 u	qu
Client Surface Creek Ditch and Reservoir Company	TEMP			X					
Client Rep. Keith Waibel		Still	Moderate	e High			Repo	ort No.	
	WIND	Х							
Contractor <u>Con-Sy</u>		Dry	Moderate	e Humio	t		1	3	
Contractor Rep. Wayne Boulderston	HUMIDITY	X							
CONSTRUCTION ACTIVITIES:									

On-site at 11:00am.

Observed contractor moisture condition slopes, placing and compacting fill and screening material.

Took density test when I arrived just after HB test.

All tests met 97% min.

Left site at 3:15pm.

#### Page 1 of 1

BY: Jeramy Harshman

Number of site visits today:				
ARRIVAL TIME	DEPARTURE TIME	TRAVEL	MILEAGE	-
7122.74844.01 Deep Ward Lake	e Field Data .xlsx FOR10.6.20jlh#13			



DATE

10/07/20

S M T W TH F S

222 South Park Avenue
Montrose, Colorado 81401
970-249-6828

		DAY		X		
Project Name Deep Ward Lake Dam Seepage Repair		Bright Sun	Clear	Overcast	Rain	Snow
Project Number 7122.74844.01	WEATHER	Χ	Χ			
		To 32	32-50	50-70	70-85	85 up
Client Surface Creek Ditch and Reservoir Company	TEMP				Χ	
Client Rep. Keith Waibel		Still	Moderate	High	Rep	port No.
	WIND	Χ				
Contractor Con-Sy		Dry	Moderate	Humid		14
Contractor Rep. Wayne Boulderston	HUMIDITY	Χ				

CONSTRUCTION ACTIVITIES:

On-site at 12:45pm to observe and test dam embankment backfill for quality assurance. Observed Con-Sy place lifts at 10112' and 10113' Elevations. Equipment in use was, JD 350D Haul Truck, JD 350G Trackhoe, CAT D5 Dozer, CAT 950G Loader, water truck and Ingersoll-Rand Compactor with vibratory in use.

Took two density tests: #1 at OW STA 0+90, Dam STA 2+90 #2 at OW STA , Dam STA

Both tests indicated specifications for moisture and density were being met.

Left site at .

#### Page 1 of 1

BY: Daniel Quigley

Number of site visits today: 1			
ARRIVAL TIME 1245p DEPARTURE TIME	TRAVEL	1.25	MILEAGE
7122.74844.01 Deep Ward Lake Field Data .xlsx FOR10.7.20dcg#14			



DATE

10/12/20

S M T W TH F S

222 South Park Avenue
Montrose, Colorado 81401
970-249-6828

		DAY	X			
Project Name Deep Ward Lake Dam Seepage Repair		Bright Sun	Clear	Overcast	Rain	Snow
Project Number 7122.74844.01	WEATHER	X	Χ			
		To 32	32-50	50-70	70-85	85 up
Client Surface Creek Ditch and Reservoir Company	TEMP		Χ			
Client Rep. Keith Waibel		Still	Moderate	High	Rej	port No.
	WIND	X				
Contractor Con-Sy		Dry	Moderate	Humid		15
Contractor Rep. <u>Wayne Boulderston</u>	HUMIDITY	X				

CONSTRUCTION ACTIVITIES:

Arrived on-site at 11:00am to perform Quality Assurance testing on embankment backfill. Con-Sy was completing the first lift of the day and processing additional embankment fill.

Took one compaction test on 10116' lift and results indicate material was meeting project specifications.

Sampled alternate source in reservoir basin for embankment material.

Left site at 12:00pm.

#### Page 1 of 1

BY: Daniel Quigley

Number of site vis	sits today:	1					
ARRIVAL TIME	1100a	DEPARTURE TIME	1200p	TRAVEL	2	MILEAGE	
7122.74844.01 De	eep Ward Lak	ke Field Data .xlsx FOR10	.12.20dcg#1	5			



DATE

10/13/20

S M T W TH F S

222 South Park Avenue
Montrose, Colorado 81401
970-249-6828

		DAY		X		
Project Name Deep Ward Lake Dam Seepage Repair		Bright Sun	Clear	Overcast	Rain	Snow
Project Number 7122.74844.01	WEATHER		X			
		To 32	32-50	50-70	70-85	85 up
Client Surface Creek Ditch and Reservoir Company	TEMP		Χ			
Client Rep. Keith Waibel		Still	Moderate	High	Rej	port No.
	WIND	Χ				
Contractor Con-Sy		Dry	Moderate	Humid		16
Contractor Rep. Wayne Boulderston	HUMIDITY	Χ				

CONSTRUCTION ACTIVITIES:

Arrived on-site at 7:45am to perform Quality Assurance testing on embankment backfill. Took one density test which met project specifications.

Some frost present in top layer of fill placed and compacted yesterday approximalty 1" deep. Contractor waited untill frost had melted off prior to ripping and mixing top 2-3". Observations showed frost had melted and contractor began placing next lift at approximatly 10:00am

Dozer down at 10:30am, left site at 11:00am.

#### Page 1 of 1

BY: Jeramy Harshman

Number of site vis	its today:	1					
ARRIVAL TIME	745a	DEPARTURE TIME	1100a	TRAVEL	2	MILEAGE	
7122.74844.01 De	ep Ward La	ke Field Data .xlsx FOR10	.13.20jlh#16				



DATE

10/14/20

S M T W TH F S

222 South Park Avenue Montrose, Colorado 81401 970-249-6828

		DAY		X		
Project Name Deep Ward Lake Dam Seepage Repair		Bright Sun	Clear	Overcast	Rain	Snow
Project Number 7122.74844.01	WEATHER		Χ			
		To 32	32-50	50-70	70-85	85 up
Client Surface Creek Ditch and Reservoir Company	TEMP			Х		
Client Rep. Keith Waibel		Still	Moderate	High	Rej	port No.
	WIND	Χ				
Contractor Con-Sy		Dry	Moderate	Humid		17
Contractor Rep. <u>Wayne Boulderston</u>	HUMIDITY	Χ				

CONSTRUCTION ACTIVITIES:

Arrived on-site at 1:30pm to perform Quality Assurance testing on embankment backfill. Took one density test which met project specifications. Contractor processing fill, no more available to place today.

Left site at 1:45pm.

### Page 1 of 1

BY: Jeramy Harshman

Number of site visits	today:	1					
ARRIVAL TIME	130p	DEPARTURE TIME	145p	TRAVEL	2	MILEAGE	
7122.74844.01 Deep	Ward Lake	Field Data .xlsx FOR10.	14.20jlh#17				



DATE

10/15/20

S M T W TH F S

222 South Park Avenue
Montrose, Colorado 81401
970-249-6828

		DAY			X	
Project Name Deep Ward Lake Dam Seepage Repair		Bright Sun	Clear	Overcast	Rain	Snow
Project Number 7122.74844.01	WEATHER		Χ			
		To 32	32-50	50-70	70-85	85 up
Client Surface Creek Ditch and Reservoir Company	TEMP		Χ			
Client Rep. Keith Waibel		Still	Moderate	High	Report No.	
	WIND	Χ				
Contractor Con-Sy		Dry	Moderate	Humid		18
Contractor Rep. Wayne Boulderston	HUMIDITY	X				

CONSTRUCTION ACTIVITIES:

Arrived on-site at 12:00pm to perform Quality Assurance testing on embankment backfill. Took one density test which met project specifications. Contractor processing fill, no more available to place today.

Left site at 12:50pm.

### Page 1 of 1

BY: Jeramy Harshman

Number of site vis	sits today:	1					
ARRIVAL TIME	1200p	DEPARTURE TIME	100p	TRAVEL	2	MILEAGE	
7122.74844.01 De	eep Ward Lak	e Field Data .xlsx FOR10	.15.20jlh#18				



DATE

10/21/20

S M T W TH F S

222 South Park Avenue
Montrose, Colorado 81401
970-249-6828

	DAY		X		
	Bright Sun	Clear	Overcast	Rain	Snow
WEATHER		Χ			
	To 32	32-50	50-70	70-85	85 up
TEMP		Х			
	Still	Moderate	High	Rep	port No.
WIND	Х				
	Dry	Moderate	Humid		19
HUMIDITY	Χ				
	WEATHER TEMP WIND HUMIDITY	DAY Bright Sun WEATHER To 32 TEMP Still WIND X Dry HUMIDITY	DAY Bright Sun Clear WEATHER Clear To 32 32-50 TEMP Still Moderate WIND X Oderate HUMIDITY X Oderate	DAYXBright SunClearOvercastWEATHERXITo 3232-5050-70TEMPXIStillModerateHighWINDXIDryModerateHumidHUMIDITYXI	DAYXBright SunClearOvercastRainWEATHERXIITo 3232-5050-7070-85TEMPXIIStillModerateHighRepWINDXIIDryModerateHumidHUMIDITYXII

CONSTRUCTION ACTIVITIES:

Arrived on-site at 3:30pm to perform Quality Assurance testing on embankment backfill. Took one density test which met project specifications. Contractor processing fill, no more available to place today.

Left site at 4:10pm.

### Page 1 of 1

BY: Jeramy Harshman

Number of site visi	ts today:	1					
ARRIVAL TIME	330p	DEPARTURE TIME	410p	TRAVEL	2	MILEAGE	-
7122.74844.01 Dee	ep Ward Lak	e Field Data .xlsx FOR10.	21.20jlh#19	)			



DATE

10/22/20

222 South Park Avenue
Montrose, Colorado 81401
970-249-6828

			S N	Л	ΤW	TH F	S	
		DAY				X		
Project Name Deep Ward Lake Dam Seepage Repair		Bright Sun	Clear		Overcast	Rain	Snow	
Project Number 7122.74844.01	WEATHER		Χ					
		To 32	32-50		50-70	70-85	85 up	
Client Surface Creek Ditch and Reservoir Company	TEMP		Χ					
Client Rep. Keith Waibel		Still	Moderat	te	High	Rej	Report No.	
	WIND	Χ						
Contractor <u>Con-Sy</u>		Dry	Moderat	te	Humid	d <b>20</b>		
Contractor Rep. <u>Wayne Boulderston</u>	HUMIDITY	Χ						

CONSTRUCTION ACTIVITIES:

Arrived on-site at 11:00am to perform Quality Assurance testing on embankment backfill. Took one density test which met project specifications. Contractors' power screen down, they hope to have fixed this afternnoon, no more fill available to place today.

Left site at 12:00pm.

### Page 1 of 1

BY: Jeramy Harshman

Number of site vis	its today:	1					
ARRIVAL TIME	1100a	DEPARTURE TIME	1200p	TRAVEL	2	MILEAGE	
7122.74844.01 D€	ep Ward Lak	e Field Data .xlsx FOR10	.22.20jlh#20				



DATE

10/22/20

222 South Park Avenue
Montrose, Colorado 81401
970-249-6828

			S	М	ΤW	TH	I F	S	
		DAY					Χ		
Project Name Deep Ward Lake Dam Seepage Repair		Bright Sun	Clea	ar	Overcast		Rain	S	now
Project Number 7122.74844.01	WEATHER		Х	r L					
		To 32	32-5	50	50-70	7	0-85	8	5 up
Client Surface Creek Ditch and Reservoir Company	TEMP		Х	,					
Client Rep. Keith Waibel		Still	Moder	ate	High	Report No.			
	WIND	Χ							
Contractor <u>Con-Sy</u>		Dry	Moder	ate	Humid			21	
Contractor Rep. <u>Wayne Boulderston</u>	HUMIDITY	X							

CONSTRUCTION ACTIVITIES:

Arrived on-site at 10:20am to perform Quality Assurance testing on embankment backfill. Took othree density tests to top of dam, elevation 11,128.5'. Final lift of topsoil material stockpiled at each end of breach will be placed after DOWL survey stakes dam crest with final elevations.

Left site at 3:15pm

### Page 1 of 1

BY: Jeramy Harshman

Number of site vis	sits today:	1					
ARRIVAL TIME	1020a	DEPARTURE TIME	315p	TRAVEL	2	MILEAGE	
7122.74844.01 De	eep Ward Lak	ke Field Data .xlsx FOR10.	23.20jlh#21				