City of Dawson Creek

Reclaimed Water Facility

URBAN systems

File #: 0714.0089.02
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summary

The City of Dawson Creek faced an increasing frequency of drought conditions and was challenged to supply truck filling stations with potable water to support hydraulic fracturing demands. Urban Systems worked with the City to create an innovative reclaimed water facility in partnership with Shell Canada. Treated sewage, once thought of as waste, now supplies Shell's operations, among other uses, decreasing demand on potable water systems while creating a revenue stream for the City.

innovation

The City of Dawson Creek (CODC) Reclaimed Water Facility began with the realization that water scarcity is a global issue that must be solved locally through collaboration between industry and the public. Extreme drought conditions were limiting CODC's ability to supply truck filling stations with potable water to support hydraulic fracturing demands. The solution arose from a simple question: why is sewage considered a waste rather than a resource that can be utilized by hydraulic fracturing operations in a manner that is beneficial for society, the economy and the environment? Urban Systems first tested this idea by applying engineering first principles to determine industrial hydraulic fracturing water quality and quantity needs, and exploring treatment technologies most suitable to a northern climate. Environmental and social issues were also considered for the industrial use of reclaimed water. Extensive industrial consultation was undertaken to learn about opportunities for hydraulic fracturing while moving through preliminary feasibility studies and identifying potential treatment technologies. The outcome of this work was presented to industry and the public, and was found to be so compelling that four proponents submitted proposals to partner with the CODC, each offering significant financial contributions to the project. Shell Canada and the CODC ultimately partnered on the project which consisted of a unique treatment process for a northern environment, LEED design criteria, a municipal reclaimed water truck filling station, a Shell Canada owned and operated pump station, and a 48 kilometer pipeline to transport the water to Shell's field operations.

While there are many reclaimed water projects in Canada, this project is unique in its application of hydraulic fracturing information, treatment technology, imagination, and team initiative to transform a waste into a resource. This would not have been possible without the industrial and public consultation that created the joint venture and public support to finance the project. The final solution not only satisfied CODC's specific needs, but is replicable at an economic cost that has inspired other communities to take the same approach. Partnerships that follow the CODC project will benefit from

this innovation and will ultimately incur less risk. The chosen treatment technology has proven itself in the northern environment, demonstrated its ease of operation in this application, and has opened the door for other northern facilities to use this technology in an entirely new range of applications. The City now has a new revenue stream and fewer trucks on the road.

complexity

This project utilized a treatment technology that was new to a northern environment for treating wastewater for use in the hydraulic fracturing operations. Special consideration had to be given to how well this technology would perform over the lifecycle of the facility, the finished water quality and potential interactions with additives that are used in hydraulic fracturing operations, and the potential for water quality to deteriorate during transport in the 48 kilometer pipeline. Close collaboration with Shell Canada was required to ensure the treatment facility was fully integrated with the Shell pump station, transmission line and field storage. The facility was designed to meet LEED objectives, adding further complexity to the design process.

While developing an innovative wastewater treatment process for hydraulic fracturing operations was challenging in itself, creating a long term agreement that met both the needs of the municipality and Shell Canada required careful consideration and public consultation in order to secure project financing.

As the project progressed, special consideration had to be given to the uses of the reclaimed water, how it would be handled in the field, and also how it would be handled in the event of a spill. Given that the reclaimed water represented a significant reduction in the discharge to Dawson Creek, consideration was also given to commissioning and how the wastewater discharge to the creek would be reduced to ensure fish and their habitat were not put at risk.

social & economic benefits

The reclaimed water facility is designed to treat 4000 cubic meters per day (m3/d) and has significant economic benefits to the community and industry. 3400 m3/d is allocated to Shell Canada and 600 m3/d is allocated to the City of Dawson Creek bulk truck filling station. If Shell doesn't take the full 3400 m3/d, or if the facility produces more than

4000 m3/d, the City can sell the surplus reclaimed water. The City received the majority of funding from Shell Canada to support the design and construction of the facility for Shell's secured access to the reclaimed water for 10 years. The City sale of the bulk reclaimed water could generate over $5.5 million dollars in revenue over the same 10 year period. Local industry will benefit from a stable water supply even during drought conditions when restrictions are imposed.

The reclaimed water supports Shell's Groundbirch venture which includes five natural gas processing plants, over 300 wells and a gas collection system. The operation is currently producing enough natural gas to meet the needs of approximately 400,000 Canadian homes. Piping the water to Groundbirch rather than trucking it means a reduction in traffic, noise and dust, which are among the top concerns of local landowners. The pipeline option is expected to eliminate three million kilometers a year in truck trips over the course of full gas field development. The Groundbirch venture and the reclaimed water infrastructure that was built to support the venture created significant economic activity in the area.

environmental

Sustainable communities recognize the value of making the most of what they have and ensuring that consumption of resources is reduced or eliminated. To successfully achieve this, the community's environmental, economic, political and social drivers must be well understood and balanced. It was recognized at the outset, that for this project to be successful public and industrial consultation would need to occur in parallel with an understanding of the economics of reusing wastewater for hydraulic fracturing and the environmental considerations of such a unique project.

By balancing these sustainability drivers the community was able to partner with industry to create a win-win situation. Shell Canada was able to get a secured source of water that would be available even during drought conditions while supporting the community with funding to help build the facility. The water quality met the highest reclaimed water standard in British Columbia at the time of commissioning and a significant portion of the wastewater previously discharged to the environment is now being reused for beneficial uses, while generating a new revenue stream for the City.

Other environmental benefits of the project include eliminating the need for trucking water to Shell's Groundbirch facility estimated at three million kilometers a year in truck trips over the course of the development, eliminating the need for using pristine water resources for the shale gas development, and the LEED designed treatment facility is demonstrating what is possible for other treatment facilities that are designed with environmental protection and energy conservation in mind.

treatment process

To ensure the treatment process was cost effective the team made use of the existing lagoon treatment system and added three Submerged Attached Growth Reactors (SAGR) cells. Using the SAGR process is unique to a northern environment and required a thick insulating layer of mulch on the cells as well as an aeration system design that allowed for improved treatment. Tertiary treatment is provided downstream of the SAGR cells with coagulation, disc filtration and chlorination for disinfection. The polished water is distributed to Shell's Groundbirch facility via the Shell pump station and a 48 kilometer pipeline. The remaining reclaimed water is distributed by the new City truck filling station. Four drawings are provided to provide an overview of the treatment building site, the SAGR cells, the facility main floor process layout, and the system conceptual hydraulic design. More details are available upon request.

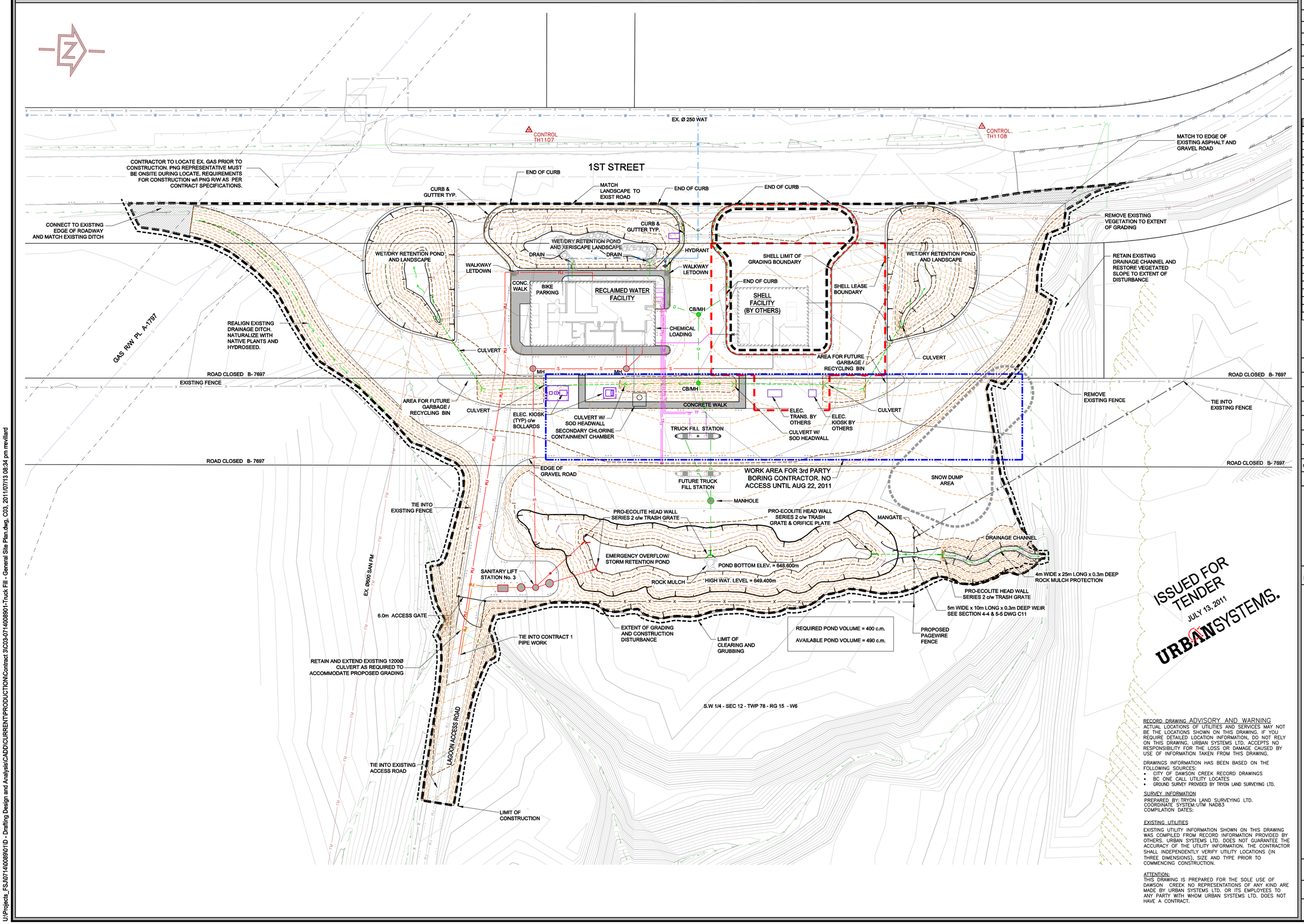
client needs

The City of Dawson Creek states on its website that it will be a visionary community that works together for innovative social, cultural, economic and environmental vitality. The City's guiding principles are centered on trust and integrity, inclusivity, modern economy, creativity, health, environment, and lifestyle. Each of these guided the project to meet the City's overall community objectives. It started with asking creative questions and having the vision to seek the answers. The public and industry consultation process was required to ensure inclusivity and to build the trust and integrity that would be needed later to ensure a successful agreement with industry could be developed. The project also recognized that a modern economy is not about going it alone, but rather partnering and collaborating with others. In this particular case the partnership was with Shell Canada, but this unique project has laid the ground work for others to follow.

Designing the facility with LEED principles ensured that the City was building a legacy in the built environment and a healthy workplace that is not only connected to the surrounding environment but also working to protect it. This facility creates a workplace that has a lifestyle component that is in keeping with the City's vision for the community while setting an example for other buildings in the area.

Ultimately the project was about partnering with industry to help finance a reclaimed water facility to reduce potable water demand for non-potable uses. To that end the project was a resounding success.

TRUCK FILL STATION PLAN



ISSUED FOR TENDER
JULY 13, 2011
URBANSYSTEMS.

RECORD DRAWING ADVISORY AND WARNING
ACTUAL LOCATIONS OF UTILITIES AND SERVICES MAY NOT BE THE LOCATIONS SHOWN ON THIS DRAWING. IF YOU REQUIRE DETAILED LOCATION INFORMATION, DO NOT RELY ON THIS DRAWING. URBAN SYSTEMS LTD. ACCEPTS NO RESPONSIBILITY FOR THE LOSS OR DAMAGE CAUSED BY USE OF INFORMATION TAKEN FROM THIS DRAWING.

DRAWINGS INFORMATION HAS BEEN BASED ON THE FOLLOWING SOURCES:
- CITY OF DAWSON CREEK RECORD DRAWINGS
- BC ONE CALL UTILITY LOCATES
- GROUND SURVEY PROVIDED BY TRYON LAND SURVEYING LTD.

SURVEY INFORMATION
PREPARED BY:TRYON LAND SURVEYING LTD.
COORDINATE SYSTEM:UTM NAD83
COMPILATION DATES:

EXISTING UTILITIES
EXISTING UTILITY INFORMATION SHOWN ON THIS DRAWING WAS COMPILED FROM RECORD INFORMATION PROVIDED BY OTHERS. URBAN SYSTEMS LTD. DOES NOT GUARANTEE THE ACCURACY OF THE UTILITY INFORMATION. THE CONTRACTOR SHALL INDEPENDENTLY VERIFY UTILITY LOCATIONS (IN THREE DIMENSIONS), SIZE AND TYPE PRIOR TO COMMENCING CONSTRUCTION.

ATTENTION:
THIS DRAWING IS PREPARED FOR THE SOLE USE OF DAWSON CREEK NO REPRESENTATIONS OF ANY KIND ARE MADE BY URBAN SYSTEMS LTD. OR ITS EMPLOYEES TO ANY PARTY WITH WHOM URBAN SYSTEMS LTD. DOES NOT HAVE A CONTRACT.

ISSUES

DESCRIPTION	DATE (yy/mm/dd)
FOR PRELIMINARY	–
FOR APPROVAL	–
FOR TENDER	11/07/13
FOR CONSTRUCTION	–
FOR RECORD	–
FOR ARCHIVE	–

LEGEND

EXISTING	DESCRIPTION	PROPOSED
	CULVERT (BURIED)	
	DRAINAGE SWALE	
	EDGE OF GRAVEL	
	STRUCTURE	
	FENCE	
	PROPERTY LINE	
	TOP OF BANK	
	BOTTOM OF BANK	
	TREE LINE	
	UTILITY RIGHT-OF-WAY	
	SANITARY FORCEMAIN	
	SANITARY GRAVITY MAIN	
	STORM MAIN	
	WATER MAIN	
	TRUCK FILL LINE	
	FILTER WASTE	
	BUILDINGS CONNECTION LINE	
	CHLORINE CHAMBER LINE	
	GAS MAIN	
	CLEARING & GRUBBING LIMIT	
	GRADING/CONSTRUCTION LIMIT	
	SHELL LEASE HOLD BOUNDARY	
	SHELL GRADING LIMIT	
	UTILITIES (BY OTHERS)	

REVISIONS

NO.	yy/mm day	DESCRIPTION	BY	APP'D
7				
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DES. RR/CL
DWN. TK/DLF/RR
DATE 10-07-21
CHK. PC/TM

P. ENG. T.MCCLELLAND DATE

SCALE 0 4 1:400 20m

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the City of Dawson Creek BRITISH COLUMBIA "the Capital of the Peace"

RECLAIMED WATER PROJECT CONTRACT 3

Plan

PROJECT No. 0714.0089.02

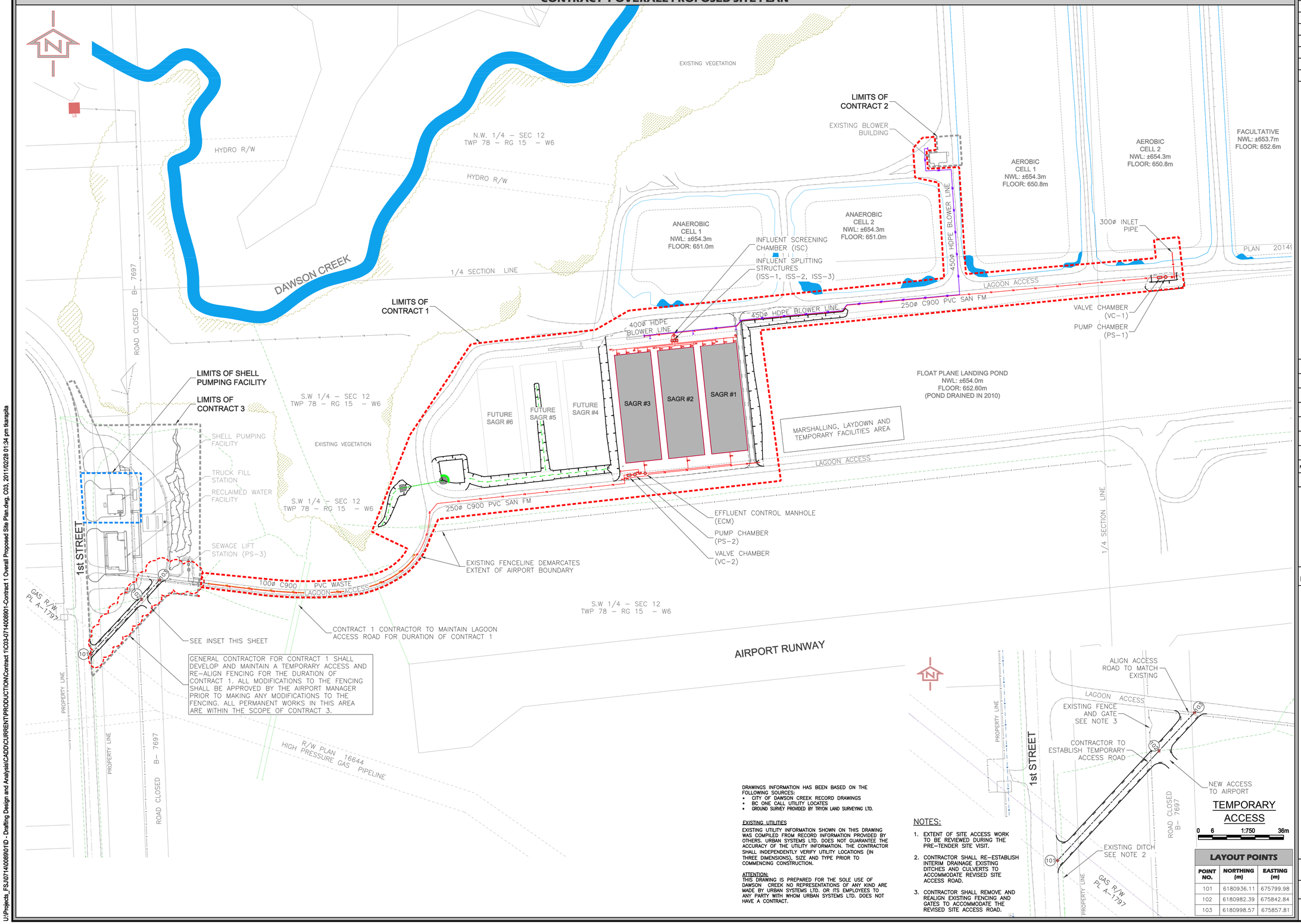
SHEET 3 OF 16

DRAWING No. C03

DESTROY ALL PRINTS PRIOR TO R 0

U:\Projects_FS_0714\0089\01D - Drafting Design and Analysis\CADD\CURRENT\PRODUCTION\Contract 3\C03-0714\0089\01-Truck Fill - General Site Plan.dwg, C03, 2011/07/13 08:34 pm rrevillard

CONTRACT 1 OVERALL PROPOSED SITE PLAN



GENERAL CONTRACTOR FOR CONTRACT 1 SHALL DEVELOP AND MAINTAIN A TEMPORARY ACCESS AND RE–ALIGN FENCING FOR THE DURATION OF CONTRACT 1. ALL MODIFICATIONS TO THE FENCING SHALL BE APPROVED BY THE AIRPORT MANAGER PRIOR TO MAKING ANY MODIFICATIONS TO THE FENCING. ALL PERMANENT WORKS IN THIS AREA ARE WITHIN THE SCOPE OF CONTRACT 3.

DRAWINGS INFORMATION HAS BEEN BASED ON THE FOLLOWING SOURCES:
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- BC ONE CALL UTILITY LOCATES
- GROUND SURVEY PROVIDED BY TRYON LAND SURVEYING LTD.

EXISTING UTILITIES

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NOTES:

1. EXTENT OF SITE ACCESS WORK TO BE REVIEWED DURING THE PRE–TENDER SITE VISIT.
2. CONTRACTOR SHALL RE–ESTABLISH INTERIM DRAINAGE EXISTING DITCHES AND CULVERTS TO ACCOMMODATE REVISED SITE ACCESS ROAD.
3. CONTRACTOR SHALL REMOVE AND REALIGN EXISTING FENCING AND GATES TO ACCOMMODATE THE REVISED SITE ACCESS ROAD.

LAYOUT POINTS

POINT NO.	NORTHING (m)	EASTING (m)
101	6180936.11	675799.98
102	6180982.39	675842.84
103	6180998.57	675857.81

ISSUES

DESCRIPTION	DATE (yy/mm/dd)
FOR PRELIMINARY	
FOR APPROVAL	
FOR TENDER	11–02–28
FOR CONSTRUCTION	
FOR RECORD	
FOR ARCHIVE	

LEGEND

EXISTING	DESCRIPTION	PROPOSED
	CULVERT	
	CULVERT (BURIED)	
	DRAINAGE SWALE	
	EDGE OF GRAVEL	
	STRUCTURE	
	FENCE	
	PROPERTY LINE	
	TOP OF BANK	
	BOTTOM OF BANK	
	TREE LINE	
	UTILITY RIGHT–OF–WAY	
	WATER SURFACE (PLAN)	
	SANITARY FORCEMAIN	
	~~SANITARY FORCEMAIN (ABANDONED)~~	
	SANITARY MAIN	
	BLOWER LINE	
	FILTER WASTE	
	UNDERGROUND POWER	
	OVERHEAD ELECTRICAL	
	WATER MAIN	

ISSUED FOR TENDER FEBRUARY 28, 2011

URBANSYSTEMS.

NO.	yy/mm day	DESCRIPTION	BY	APP'D
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REVISIONS

DES. SD/AG
DWN. TK
DATE 10–07–21
CHK. PC

P. ENG. _____ DATE _____

SCALE 0 10 25 1:1500 75m

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RECLAIMED WATER PROJECT CONTRACT 1

Contract 1 Overall Proposed Site Plan

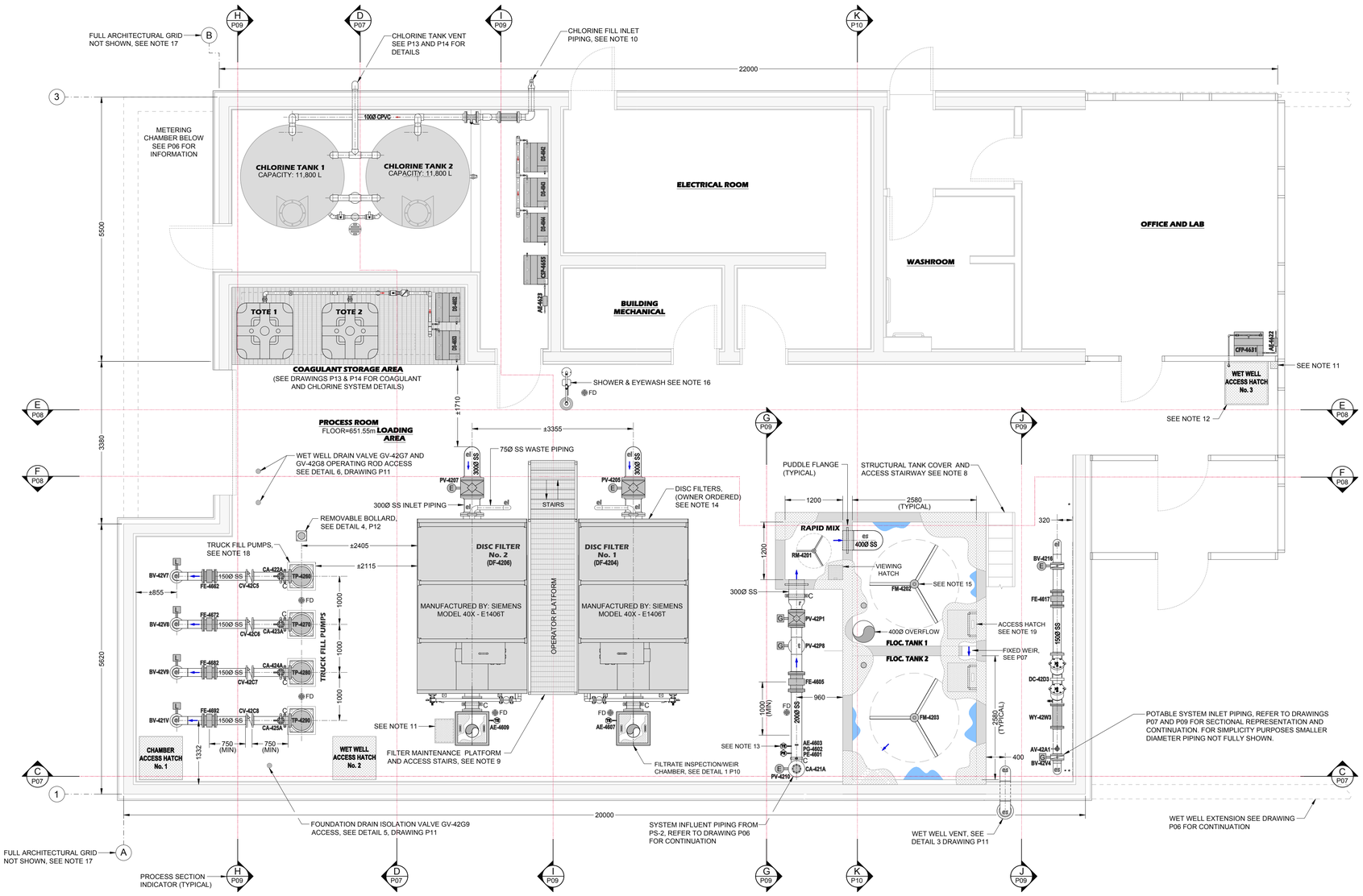
PROJECT No. 0714.0089.02

SHEET 3 OF 13

DRAWING No. C03

DESTROY ALL PRINTS PRIOR TO R 0

U:\Projects_FS\0714\0089\01D - Drafting Design and Analysis\CADD\CURRENT\PRODUCTION\Contract 1\C03-0714\0089\01-Contract 1 Overall Proposed Site Plan.dwg, C03, 2011/02/28 01:34 pm tkarapita



A-A P05 **SECTION - FACILITY HORIZONTAL PROCESS LAYOUT**
1:50 (Full Size), 1:100 (Half Size)

COMPONENT LEGEND

COMPONENT DESCRIPTION	ABB	SYMBOL
AIR RELEASE VALVE PLAN VIEW	AV-428#	
AIR RELEASE VALVE C/W ISOLATION BALL VALVE AND ID	AV-428#	
ANALYSIS ELEMENT - PARTICLE	AE-468#	SE
ANALYSIS ELEMENT - PRESSURE	AE-468#	PE
ANALYSIS ELEMENT - TURBIDITY	AE-468#	TE
BALL VALVE AND ID	BL-468#	
BUTTERFLY VALVE (N/C)	BV-428#	
BUTTERFLY VALVE (N/O)	BV-428#	
CHECK VALVE (TOP VIEW) SWING TYPE	CV-428#	
CHECK VALVE (SIDE VIEW) SWING TYPE	CV-428#	
CHECK VALVE (SIDE VIEW) SPRING TYPE FOR PRESSURE SYS.	CV-428#	
COMBINATION AIR VALVE SEWAGE TYPE (SIDE VIEW)	CA-428#	
ELBOW 90° WELDED STEEL		
ELBOW 45° WELDED STEEL		
MECHANICAL RESTRAINT FOR PVC PIPE JOINT	MJ	
FLOW METER (MAGNETIC TYPE) TOP VIEW	FE-428#	
FLOW METER (MAGNETIC TYPE) SIDE VIEW	FE-428#	
FLOOR DRAIN	FD	
GATE VALVE (N/C)	GV-428#	
GATE VALVE (N/O)	GV-428#	
GROOVED JOINT COUPLING SIDE VIEW	C	
GROOVED JOINT COUPLING TOP VIEW	C	
PIPE SECTION OR END		
PLUG VALVE (N/C)	PV-428#	
PLUG VALVE (N/O)	PV-428#	
PIPE/COMP STAND - FLANGE TYPE	S	
PIPE/COMP STAND - SADDLE TYPE	S	
PRESSURE GAUGE C/W ISOLATION	PG-428#	
STEEL FLANGE (SLIP ON TYPE)		
STEEL FLANGE (WELD NECK TYPE)		
STEEL TEE (WELD TYPE)		
RESTRAINED COUPLER & ID	RC	
TRANSITION COUPLER ID	TC	
VALVE OPERATOR (ELECTRIC)		E
VALVE OPERATOR (MANUAL GEAR)		G
VALVE OPERATOR (MANUAL LEVER)		

LINE WORK	LINE TYPE
PRIMARY TREATMENT FLOW	
DRAIN PIPE FLOW DIRECTION	
CHEMICAL FEED PIPING	
FULL WATER LEVEL	
LOW WATER LEVEL	
PROPOSED EQUIPMENT	
EXISTING PIPE CENTRE	
PROPOSED CONCRETE	
PROPOSED CONCRETE HIDDEN	
PROPOSED STRUCTURE	
STEEL PIPE (LARGE DIAMETER) LINE	
STEEL PIPE (SMALL DIAMETER) LINE	
STEEL DRAIN PIPE LINE	
CHEMICAL FEED PIPE LINE TYPE	

FITTING ABBREVIATIONS	ABB.
BELL MOUTH	bm
ELBOW 90° - LONG RADIUS (STEEL)	el
ELBOW 90° - SHORT RADIUS (STEEL)	es
90° PVC/CPVC ELBOW OR STEEL ELBOW < 90°	e
CUSTOM FABRICATED CROSS	cc
REDUCER (CONCENTRIC)	r
REDUCER (ECCENTRIC)	re
TEE (STANDARD)	t
WYE	w

PIPE ABBREVIATIONS	ABB.
STAINLESS STEEL PIPE	SS
CARBON STEEL PIPE	S
PVC PIPE	PVC
CHLORINATED PVC PIPE	CPVC

ISSUES

DESCRIPTION	DATE (yy/mm/dd)
FOR PRELIMINARY	11/06/24
FOR APPROVAL	–
FOR TENDER	11/07/12
FOR CONSTRUCTION	–
FOR RECORD	–
FOR ARCHIVE	–

ISSUED FOR TENDER
JULY 12, 2011
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NO.	yy/mm dd	DESCRIPTION	BY	APP'D
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REVISIONS

DES. SD
DWN. SD
DATE 11–07–12
CHK. PC
P. ENG. _____ DATE YY–MM–DD
SCALE

URBANSYSTEMS.

the City of Dawson Creek
BRITISH COLUMBIA
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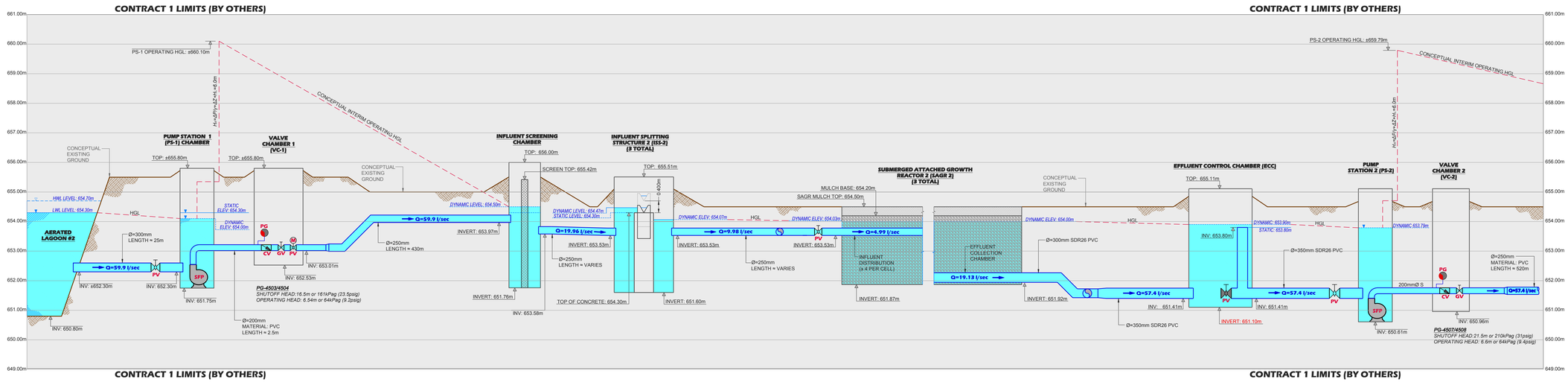
RECLAIMED WATER PROJECT CONTRACT 3

FACILITY MAIN FLOOR HORIZONTAL PROCESS LAYOUT PLAN

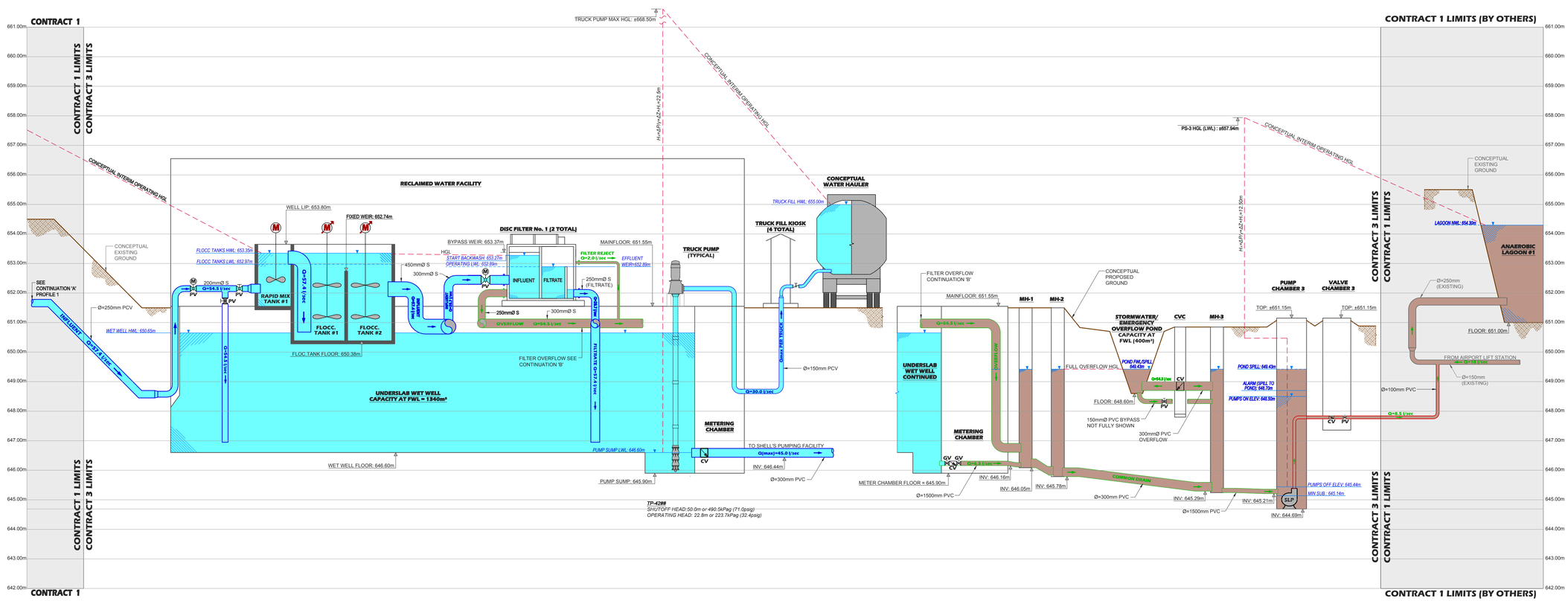
PROJECT No. 0714.0089.02
SHEET 5 OF 16
DRAWING No. P05
DESTROY ALL PRINTS PRIOR TO R 0

PROCESS MECHANICAL NOTES:

1. COMPONENTS AS SHOWN HAVE BEEN DESIGNED TO SCALE AND ANSI STANDARD DIMENSIONS.
2. ALL WORK SHALL BE IN ACCORDANCE WITH THE CITY OF DAWSON CREEK STANDARDS.
3. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.
4. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS PRIOR TO FABRICATION. REFER TO SPECIFICATIONS FOR SHOP DRAWING AND FABRICATION REQUIREMENTS.
5. THE MAJORITY OF ARCHITECTURAL, ELECTRICAL, HVAC AND STRUCTURAL ELEMENTS ARE NOT SHOWN ON PROCESS DRAWINGS. REFER TO THE APPROPRIATE DRAWINGS AND SPECIFICATIONS FOR THIS INFORMATION.
6. ALL PROPOSED SYSTEM PROCESS AND DRAIN PIPING WITHIN THE PLANT SHALL BE TYPE 304 SCHEDULE 10 STAINLESS STEEL AND IS IDENTIFIED WITH THE ABBREVIATION 'SS'. SCHEDULE 10 SS PIPING SHALL TRANSITION TO SCHEDULE 40 SS PIPE WHERE EXTERIOR WALL OR SLAB PENETRATIONS ARE ENCOUNTERED. WHERE APPLICABLE, SCHEDULE 40 CARBON STEEL PIPING HAS BEEN USED AND IS IDENTIFIED WITH THE ABBREVIATION 'S'. REFER TO THE ADJACENT LEGEND FOR A SUMMARY OF PIPING IDENTIFYING ABBREVIATIONS.
7. REFER TO SPECIFICATIONS FOR STAINLESS STEEL GROOVED PIPE COUPLER REQUIREMENTS. PROPOSED GROOVED PIPE COUPLER LOCATIONS HAVE BE SHOWN AND LABELED WITH THE ABBREVIATION 'C'. INSTALL GROOVED PIPE COUPLERS AS PER MANUFACTURERS REQUIREMENTS.
8. FLOCCULATION AND RAPID MIX TANKS SHALL BE INSTALLED WITH A STRUCTURAL COVER AND HANDRAIL. REFER TO ARCHITECTURAL AND STRUCTURAL DRAWINGS FOR REQUIREMENTS. FLOCCULATION AND COAGULANT MIXERS BASES TO BE MOUNTED FLUSH WITH STRUCTURAL COVER. MOUNTING OF MIXERS SHALL BE IN ACCORDANCE WITH MANUFACTURERS REQUIREMENTS. REFER TO DETAIL 1 DRAWING P12.
9. FILTER ACCESS PLATFORM AND STAIRWAY WILL BE PROVIDED BY FILTER MANUFACTURER. REFER TO DRAWING P11 FOR DIMENSIONAL INFORMATION AND OTHER REQUIREMENTS.
10. REFER TO DRAWINGS P13 AND P14 FOR A LARGER REPRESENTATION OF THE CHLORINE AND COAGULANT SYSTEM FOR LAYOUT DETAILS.
11. PRIMARY OR SECONDARY CHLORINE DOSING ACCESS HATCHES, SEE DRAWING P14 FOR ADDITIONAL INFO AND TYPICAL REQUIREMENTS. ALL FLOOR HATCHES SHALL BE FIRE RATED, SEE ARCHITECTURAL DRAWINGS FOR FIRE RATING REQUIREMENTS.
12. REFER TO ARCHITECTURAL AND STRUCTURAL FOR WET WELL ACCESS HATCH INSTALLATION REQUIREMENTS. SEE PROCESS SPECIFICATIONS FOR APPROVED MANUFACTURERS.
13. ENSURE ALL CHLORINE AND TURBIDITY ANALYSIS INSTRUMENT DRAINS ARE CONNECTED DIRECTLY TO FLOOR DRAINS. TO AVOID TRIPPING HAZARDS, ALL INSTRUMENT DRAIN PIPING SHALL BE CAST INTO FLOOR SLAB.
14. THE DISC FILTERS WILL BE OWNER ORDERED, REFER TO SPECIFICATIONS AND CONTRACT DOCUMENTS FOR REQUIREMENTS. THE DISC FILTERS SHALL BE INSTALLED ON CAST-IN-PLACE CONCRETE HOUSE KEEPING PADS. REFER TO PROCESS DRAWING P06 AS WELL AS ARCHITECTURAL AND STRUCTURAL DRAWINGS FOR LAYOUT INFORMATION.
15. REFER TO DRAWING P13 FOR FLOCCULATION AND RAPID MIXER MOUNTING REQUIREMENTS. UNITS TO BE INSTALLED WITH COUPLED DRIVE SHAFTS AND REMOVABLE BLADES TO ENSURE ADEQUATE VERTICAL CLEARANCE DURING FUTURE MAINTENANCE SERVICING AND REPLACEMENT.
16. CONNECT EMERGENCY EYEWASH DRAIN DIRECTLY TO UNDER-SLAB FLOOR DRAIN SYSTEM. DRAIN PIPING TO BE CAST INTO SLAB TO ENSURE NO TRIPPING HAZARD EXISTS. SEE PROCESS DIAGRAMS AND PLUMBING DRAWING FOR POTABLE WATER CONNECTION LOCATIONS.
17. FOR REFERENCING PURPOSES, ARCHITECTURAL GRID INDICATORS HAVE BEEN PARTIALLY SHOWN ON THE NORTH END OF THE BUILDING. REFER TO ARCHITECTURAL DRAWINGS FOR ALL BUILDING DIMENSIONAL INFORMATION. THE PROCESS SECTION INDICATORS, AS SHOWN, DO NOT CORRESPOND TO THE ARCHITECTURAL GRID.
18. REFER TO DRAWING P06 FOR PRECISE LAYOUT OF TRUCK FILL PUMP CENTERS IN RELATION TO EXTERIOR UNDER-SLAB WET WELL WALL. ENSURE PUMP SPACING, AS SHOWN, IS MAINTAINED. ENSURE THAT TRUCK FILL COMPONENT SPACING, INCLUDING CHECK VALVES AND FLOW METERS ARE INSTALLED AS PER THE DIMENSIONS SHOWN. SEE DETAIL DRAWING 11 FOR PUMP BASE CONSTRUCTION REQUIREMENTS.
19. INSTALL 600x600mm CLEAR OPENING BILCO STYLE HATCHES FOR EACH FLOCCULATION TANK. HATCHES SHALL BE INSTALLED SO THAT THEY LAY FLUSH WITH TOP OF TANK CHECKER PLATE DECKING. REFER TO SPECIFICATIONS FOR FURTHER REQUIREMENTS.



SITE - CONCEPTUAL SYSTEM HYDRAULIC PROFILE 1
SCALE H: NTS, SCALE V: 1:75



PROFILE 2 - CONCEPTUAL HYDRAULIC DESIGN INFORMATION
SCALE H: NTS, SCALE V: 1:75

ISSUES

DESCRIPTION	DATE (yy/mm/dd)
FOR PRELIMINARY	–
FOR APPROVAL	11/06/22
FOR TENDER	11/07/12
FOR CONSTRUCTION	––
FOR RECORD	–
FOR ARCHIVE	–

LEGEND

COMPONENT DESCRIPTION	PROPOSED TAG	PROPOSED SYMBOL
BUTTERFLY VALVE	BV	
CHECK VALVE	CV	
GATE VALVE (MANUALLY ACTUATED)	GV	
MOTOR		M
MOTOR (VFD DRIVE)		M
PRESSURE GAUGE	PG	
PLUG VALVE (MANUALLY ACTUATED)	PV	
PLUG VALVE (ELECTRICALLY ACTUATED)	PV	M

LINETYPE LEGEND

LINE STYLE	PROPOSED
DRAIN SYSTEM PIPING	
HYDRAULIC GRADE LINE (CONCEPTUAL)	
MAIN PROCESS PIPING	
MAIN PROCESS WATER	
SYSTEM DRAIN OR REJECT WATER	

ISSUED FOR TENDER
JULY 12, 2011
URBANSYSTEMS.

NO.	yy/mm/dd	DESCRIPTION	BY	APP'D
7	– –	– –	–	–
6	– –	– –	–	–
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3	– –	– –	–	–
2	– –	– –	–	–
1	– –	– –	–	–

REVISIONS

DES. SD
DWN. SD
DATE 11–07–12
CHK. PG

P. ENG. _____ DATE YY–MM–DD

SCALE NTS

URBANSYSTEMS.

The City of Dawson Creek
BRITISH COLUMBIA
"the Capital of the Peace"

RECLAIMED WATER PROJECT CONTRACT 3

SYSTEM CONCEPTUAL HYDRAULIC DESIGN INFORMATION

PROJECT No. 0714.0089.02

SHEET 16 OF 16

DRAWING No. P16

DESTROY ALL PRINTS PRIOR TO R 0