

**PROJECT MANUAL**

**Vol. No. 2 of 2**

(Contract Documents,  
Standard Specifications,  
and Special Provisions)

FOR

**2007 WASTEWATER TREATMENT  
FACILITIES IMPROVEMENTS**

**CITY OF ENTIAT**

SEPTEMBER 2007

PROJECT NO. 05-23-004-03

PREPARED BY:



**HAMMOND COLLIER  
WADE LIVINGSTONE**

104 East 9<sup>th</sup> Street  
Wenatchee, WA 98801



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2007 WASTEWATER TREATMENT  
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SHEET INDEX

JOB NO.  
0523004-03  
DRAWING NO.  
G2  
SHEET  
OF

### GENERAL NOTES

### REVISIONS

DESIGNED BY: RS  
DRAWN BY: MR. DG  
CHECKED BY: [Signature]  
APPROVED BY: [Signature]  
DATE PRINTED: 09/20/07  
SCALE: NTS  
F.B. NO.



DATE: 11/08/08

**TOPOGRAPHIC & MISCELLANEOUS UTILITY SYMBOLS**

	CENTERLINE
	PROPERTY LINE OR R/W
	EASEMENT LINE
	BREAK LINE
	EXISTING STRUCTURE
	PROPOSED STRUCTURE
	EXISTING FENCE
	PROPOSED FENCE
	EXISTING CONTOUR LINE
	PROPOSED CONTOUR LINE
	EXISTING SLOPE
	EXISTING DITCH OR EDGE OF WATER
	PROPOSED DITCH OR EDGE OF WATER
	OVERHEAD TELEPHONE LINE
	UNDERGROUND TELEPHONE LINE
	OVERHEAD TV LINE
	UNDERGROUND TV LINE
	GAS LINE
	OVERHEAD POWER LINE
	UNDERGROUND POWER LINE
	EXISTING GUARDRAIL
	PROPOSED GUARDRAIL
	DRINKING FOUNTAIN
	MONITORING WELL
	SATELLITE DISH
	TELEPHONE BOOTH

**WATER SYMBOLS**

	EXISTING WATERLINE
	PROPOSED WATERLINE
	EXISTING CAP/PLUG
	PROPOSED CAP/PLUG
	EXISTING COUPLING
	PROPOSED COUPLING
	EXISTING REDUCER
	PROPOSED REDUCER
	PROPOSED THRUST BLOCK
	EXISTING WATER METER
	PROPOSED WATER METER
	EXISTING FIRE HYDRANT
	PROPOSED FIRE HYDRANT
	EXISTING FLANGE JOINT
	PROPOSED FLANGE JOINT
	EXISTING MECHANICAL JOINT
	PROPOSED MECHANICAL JOINT
	EXISTING HUB OR PUSH-ON JOINT
	PROPOSED HUB OR PUSH-ON JOINT
	EXISTING AIR RELIEF VALVE
	PROPOSED AIR RELIEF VALVE
	EXISTING BLOWOFF
	PROPOSED BLOWOFF
	EXISTING BUTTERFLY VALVE
	PROPOSED BUTTERFLY VALVE
	PRESSURE REDUCING VALVE

**SANITARY/STORM SEWER SYMBOLS**

	EXISTING FORCE MAIN
	PROPOSED FORCE MAIN
	EXISTING SANITARY SEWER
	PROPOSED SANITARY SEWER
	EXISTING STORM DRAIN
	PROPOSED STORM DRAIN
	EXISTING COMBINED SEWER
	PROPOSED COMBINED SEWER
	EXISTING SANITARY SEWER CLEAN OUT
	PROPOSED SANITARY SEWER CLEAN OUT
	EXISTING SANITARY SEWER MANHOLE
	PROPOSED SANITARY SEWER MANHOLE
	EXISTING STORM DRAIN CATCH BASIN
	PROPOSED STORM DRAIN CATCH BASIN
	EXISTING STORM DRAIN CULVERT
	PROPOSED STORM DRAIN CULVERT
	EXISTING STORM DRAIN MANHOLE
	PROPOSED STORM DRAIN MANHOLE
	STORM DRAIN INLET

**SURVEY SYMBOLS**

	FOUND SECTION CORNER
	FOUND QUARTER CORNER
	FOUND SIXTEENTH CORNER
	FOUND CLOSING CORNER
	FOUND MEANDER CORNER
	SOIL BORING
	TAX LOT NUMBER
	OWNERSHIP TIE
	ANGLE POINT
	BENCHMARK
	FOUND IRON PIPE/REBAR
	SET IRON PIPE/REBAR
	FOUND MONUMENT IN CASE
	FOUND SURFACE MONUMENT
	FOUND/SET LEAD & TACK, PK NAIL
	FOUND/SET HUB W/TACK
	SECTION CENTER

**SECTION & DETAIL NUMBERING SYSTEM**

(1) SECTION OUT ON DRAWING 5

(2) ON DRAWING 15 THIS SECTION IS SHOWN

**CROSS SECTION**  
SCALE 1" = 1'-0"

(3) DETAILS ARE CROSS-REFERENCED IN A SIMILAR MANNER EXCEPT THAT DETAILS ARE IDENTIFIED BY NUMBER RATHER THAN BY LETTER.

**ABBREVIATIONS**

AB	ANCHOR BOLT	ED	EQUIP	EQ	EQUAL	RM	ROOM
AC	ASPHALTIC CONCRETE	EQ	EQUIV	MCU	MCC	RR	RADIUS POINT, REFERENCE POINT
ACP	ASTEGOS CEMENT PIPE	ESMT	EASMT	MECH	MECH	RR	REVOLUTIONS PER MINUTE
AGG	AGGREGATE	EST	ESTIMATE	MFG	MFG	RT	RAILROAD
AL	ALUMINUM	EVC	END VERTICAL CURVE	MFR	MFR	R/W	RIGHT OF WAY
ALT	ALTERNATE	EW	EACH WAY	MG	MG	S	SOUTH, SLOPE, SANITARY SEWER
ALUM	ALUMINUM	EXCL	EXCLUDING	MG/L	MG/L	SCH	SCHEDULE
AN	ANCHOR	EXT	EXTENDING	MGR	MGR	SD	STORM DRAIN
ANCI	APPROXIMATE(LY)	EXST	EXISTING	MH	MH	SE	SOUTH-EAST
APWA	AMERICAN PUBLIC WORKS ASSOCIATION	F	FAHRENHEIT, FACE, FAN	MHHW	MHHW	SEC	SECTION
ASPH	ASPHALT	FF	FINISH FLOOR	MI	MI	SECT	SECTION
ASSY	ASSEMBLY	FAB	FABRICATION	MIN	MIN	SF	SQUARE FEET
AST	ASTEGOS CEMENT PIPE	F/F	FACE TO FACE	MISC	MISC	SHT	SHEET
AVAR	AIR VACUUM & AIR RELEASE VALVE	FI	FIRE HYDRANT	MJ	MJ	SL	SIMILAR
AUTO	AUTOMATIC	FIN GR	FINISHED GRADE	ML	ML	SL	SLOPE, SLEEVE
AUX	AUXILIARY	FL	FLANGE, FLOW LINE	MLW	MLW	SPEC	SPECIFICATIONS
AVE	AVENUE	FM	FIBER MAIN	MLW	MLW	SQ	SQUARE
AWWA	AMERICAN WATER WORKS ASSOCIATION	FO	FOOTING	MON	MON	SS	STAINLESS STEEL, SANITARY SEWER
BF	BUTTERFLY VALVE	FPM	FEET PER MINUTE	MPH	MPH	SS FM	SANITARY SEWER FORCE MAIN
BLOG	BUILDING	FRP	FEET PER SECOND	MPSL	MPSL	ST	STATION
BLK	BLOCK	FT	FEET, FOOT	N	N/A	STANDARD	STANDARD
BLM	BENCHMARK	FUT	FUTURE	NE	NE	STL	STEEL
BO	BLOW OFF	G	GUTTER, GAS	NEG	NEG	STOR	STORAGE
BOD	BIOCHEMICAL OXYGEN DEMAND	GAL	GALLON	NEG	NEGATIVE	STRUC	STRUCTURAL
BOT	BOTTOM	GALV	GALVANIZED	NO	NOT IN CONTRACT	SUPRV	SUPERVISOR
BRK	BREAK	GD	GUARD	NTS	NOT SPECIFIED	SUPRT	SUPPORT
BST	BRITISH THERMAL UNIT	GEN	GENERAL	NTS	NOT TO SCALE	SW	SOUTHWEST
BTU	BULKHEADS	GIP	GALVANIZED IRON PIPE	NT WT	NET WEIGHT	SYM	SYMMETRICAL
BWT	BACKWASH TANK	GPD	GALLONS PER DAY	NW	NORTHWEST	T	TANGENT
CB	CATCH BASIN	GPM	GALLONS PER MINUTE	O2	OXYGEN	T & M	TIME & MATERIALS
C TO C	CENTER TO CENTER	GR	GRADE, GRAVEL	OC	OUTSIDE DIAMETER, OUTSIDE DIMENSION	TB	TEMPORARY BENCHMARK
CF	CUBIC FEET	GRG	GRATING	OD	OUTSIDE DIAMETER, OVERHANG	TC	TOP OF CURB
CFH	CUBIC FEET PER HOUR	GY	GATE VALVE	ODP	OVERHEAD POWER & TELEPHONE	TF	TRANSFORMER
CFM	CUBIC FEET PER MINUTE	GTP	GIPSUM	ODP&T	OVERHEAD POWER & TELEPHONE	THD	THREADED
CFY	CUBIC FEET PER SECOND	HOPE	HIGH DENSITY POLYETHYLENE	ORIG	ORIGINAL	THK	THICK
CI	CAST IRON PIPE, CLEAN IN PLACE	H	HAND HOLE	ORIG	ORIGINAL	THRU	THROUGH
CJ	CAST IRON PIPE, CLEAN IN PLACE	H1	HAND HOLE	PC	POINT OF CURVATURE	TOC	TOP OF CONCRETE
CL	CHLORINE	H2	HAND HOLE	PE	PLAIN END	TRM	TRANSMITTER
CL2	CHLORINE	H3	HAND HOLE	PERF	PERFORATED	TRN	TRANSFORMER
CMU	CONCRETE MASONRY UNIT	H4	HAND HOLE	PH	PHASE	TYP	TYPICAL
CO	CONCRETE	H5	HAND HOLE	PI	POINT OF INTERSECTION	TWP	TOWNSHIP
CO2	CARBON DIOXIDE	HOR	HORIZONTAL	PK	PEAK	UBC	UNIFORM BUILDING CODE
COMB	COMBINATION	HTR	HEATER	PL	PROPERTY LINE	UG	UNDERGROUND
CONC	CONCRETE	HTR	HEATER	PLTR	PLASTER	UGP	UNDERGROUND POWER LINE
CONC	CONCRETE	H/V	HORIZONTAL VERTICAL	PNEU	PNEUMATIC	ULID	UTILITY LOCAL IMPROVEMENT DISTRICT
CONST	CONSTRUCTION	H/VAC	HORIZONTAL VERTICAL AIR CONDITIONING	PP	POWER POLE	U/P	UTILITY POLE
CRIB	CRIBBING	H/W	HORIZONTAL WATER	PRES	PRESSURE	USGS	UNITED STATES GEOLOGICAL SURVEY
CS	COMBINED SEWER	H/WY	HORIZONTAL WATER	PRV	PRESSURE REGULATING VALVE	UST	UNDERGROUND STORAGE TANK
CTR	CENTER	HZ	HERTZ (CYCLES PER SECOND)	PS	PUBLIC SEWER	VAR	VARIABLE
CULV	CULVERT	ID	INSIDE DIAMETER	PSF	POUNDS PER SQUARE FOOT	VC	VERTICAL CURVE
CV	CHECK VALVE	IE	INVERT ELEVATION	PSIG	POUNDS PER SQUARE INCH GAGE	VCP	VERTICAL CLAY PIPE
CY/DAY	CUBIC YARD PER DAY	INCL	INCLUDING	INSUL	INSULATION	VF	VERTICAL(S)
CYL	CYLINDER	INVT	INVERT	INV	INVERT	VF	VERTICAL(S)
D	DITCH	IRRG	IRRIGATION	K	KIP (1,000 POUNDS)	VOL	VOLUME
DET	DETAIL	K	KILOVOLT	KVA	KILOVOLT AMPERE	VPI	VERTICAL POINT OF INTERSECTION
DI	DUCTILE IRON	KW	KILOWATT	LB	POUND(S)	VSS	VOLATILE SUSPENDED SOLIDS
DIA	DIAMETER	LC	LENGTH OF CURVE	LC	LENGTH OF CURVE	W	WEST, WATER
DIAG	DIAGRAM	LD	LINEAL FOOT	LD	LINEAL FOOT	W/O	WITHOUT
DIF	DIFFERENTIAL	LEV	LEVEL	LEV	LEVEL	WD	WATER DISTRICT
DIP	DIP	LFT	LOCAL IMPROVEMENT DISTRICT	LFT	LOCAL IMPROVEMENT DISTRICT	WM	WATER MAIN, WATER METER, WIRE MESH
DIP	DIP	LFT	LOCAL IMPROVEMENT DISTRICT	LFT	LOCAL IMPROVEMENT DISTRICT	WS	WATER SURFACE
DN	DOWN	LFT	LOCAL IMPROVEMENT DISTRICT	LFT	LOCAL IMPROVEMENT DISTRICT	WT	WEIGHT
DNR	DEPARTMENT OF NATURAL RESOURCES	LFT	LOCAL IMPROVEMENT DISTRICT	LFT	LOCAL IMPROVEMENT DISTRICT	WTF	WELDED WIRE FABRIC
DR	DRIVEWAY	LFT	LOCAL IMPROVEMENT DISTRICT	LFT	LOCAL IMPROVEMENT DISTRICT	WWM	WELDED WIRE MESH
DO	DISSOLVED OXYGEN	LW	LOW WATER	LW	LOW WATER	WL	WATER LEVEL
DWG(S)	DRAWING(S)	MAINT	MAINTENANCE	MAINT	MAINTENANCE	YD	YARD
E	EAST	MAAS	MASSONRY	MAATL	MATERIAL	YR	YEAR
ECC	ECCENTRIC	MAX	MAXIMUM	MAX	MAXIMUM	#	NUMBER, POUNDS
EFF	EFFLUENT	MB	MAILBOX	MB	MAILBOX	@	DIAMETER, PHASE
EL	ELEVATION (ELEV)	ENGR	ENGINEER	ENGR	ENGINEER		
ELECT	ELECTRICAL						
ELL	ELBOW						
EMB	EMBEDDED						
EMER	EMERGENCY						
ENGR	ENGINEER						

**PROJECT RELATED NOTES**

ABBREVIATIONS AND SYMBOLS SHOWN ON THIS SHEET ARE APPLICABLE TO CIVIL DRAWINGS ONLY. FOR PIPING SERVICE AND EQUIPMENT ABBREVIATIONS SEE SHT P1A.

**PROJECT RELATED SYMBOLS**

	EXISTING WATERLINE
	PROPOSED WATERLINE
	EXISTING CAP/PLUG
	PROPOSED CAP/PLUG
	EXISTING COUPLING
	PROPOSED COUPLING
	EXISTING REDUCER
	PROPOSED REDUCER
	PROPOSED THRUST BLOCK
	EXISTING WATER METER
	PROPOSED WATER METER
	EXISTING FIRE HYDRANT
	PROPOSED FIRE HYDRANT
	EXISTING FLANGE JOINT
	PROPOSED FLANGE JOINT
	EXISTING MECHANICAL JOINT
	PROPOSED MECHANICAL JOINT
	EXISTING HUB OR PUSH-ON JOINT
	PROPOSED HUB OR PUSH-ON JOINT
	EXISTING AIR RELIEF VALVE
	PROPOSED AIR RELIEF VALVE
	EXISTING BLOWOFF
	PROPOSED BLOWOFF
	EXISTING BUTTERFLY VALVE
	PROPOSED BUTTERFLY VALVE
	PRESSURE REDUCING VALVE

**REVISIONS**

NO.	DESCRIPTION	DATE	BY
1	ISSUED FOR PERMIT	09/20/07	AW
2	REVISED FOR PERMIT	09/20/07	AW

**GENERAL NOTES**

DESIGNED BY: RN  
 DRAWN BY: STAFF  
 CHECKED BY: AW  
 APPROVED BY: AW  
 DATE PRINTED: 09/20/07  
 SCALE: N/A  
 P.B. NO.: N/A

**REVISIONS**

NO. 11/08/08  
 EXPRESS

**HAMMOND COLLIER**  
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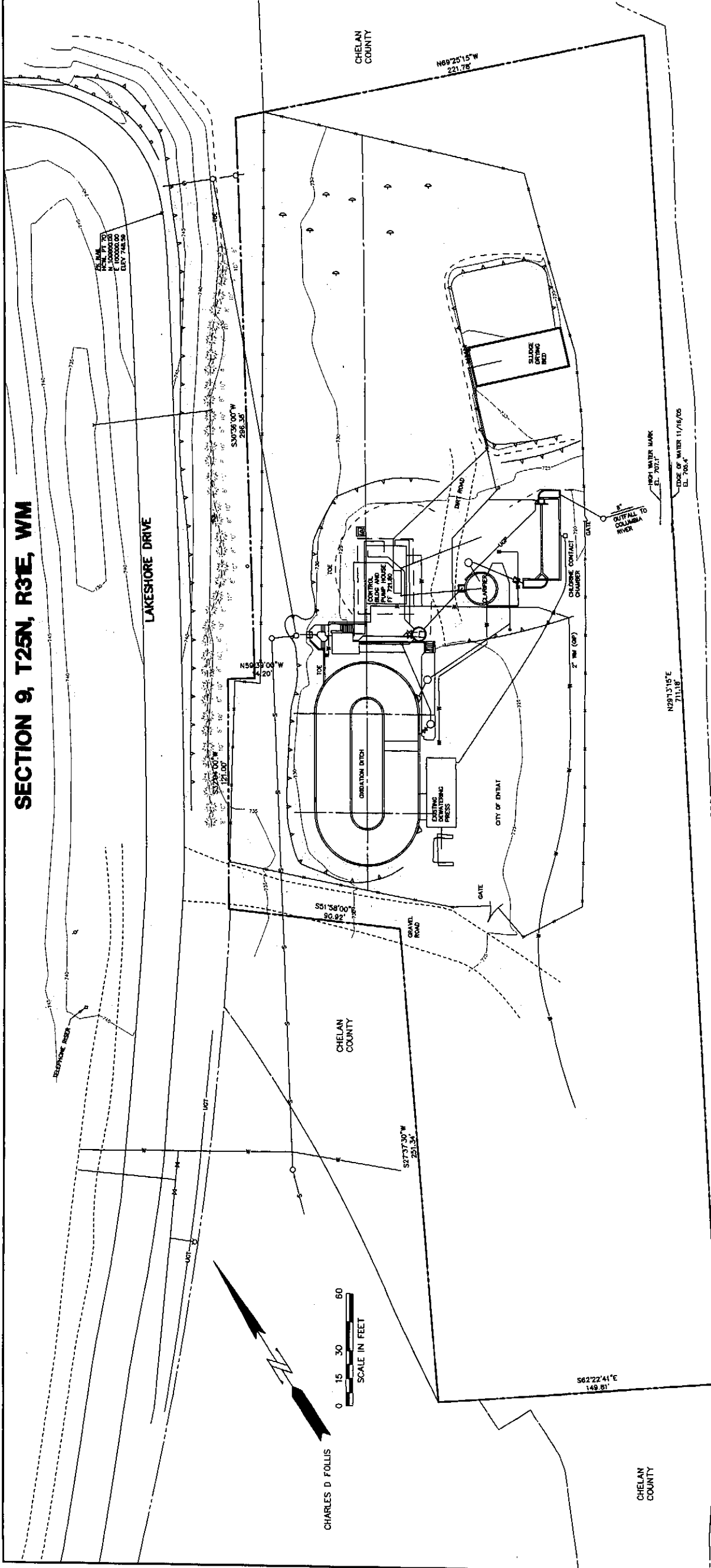
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**2007 WASTEWATER TREATMENT**  
**FACILITIES IMPROVEMENTS**

SYMBOLS & ABBREVIATIONS

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JOB NO. 0523004-03  
 DRAWING NO. G3  
 SHEET 63 OF

**SECTION 9, T25N, R31E, WM**



**COLUMBIA RIVER**

**LEGAL DESCRIPTION:**  
 THE WEST 50 FEET OF THE NORTH 150 FEET OF THE SEWER PLANT PROPERTY, DESCRIBED AS:  
 A PARCEL OF LAND CONSISTING OF PARTS OF LOTS 4 AND 5 OF BLOCK 3, PARTS OF LOTS 10 AND 11 OF BLOCK 2 OF ENTIAI FRUITLANDS, PART OF OLD VACATED P.S.H. NO. 10 AND PART OF ABANDONED COUNTY ROAD (ROGERS AVENUE), CHELAN COUNTY, WASHINGTON, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:  
 COMMENCING AT THE SW CORNER OF LOT 13 BLOCK 3 OF ENTIAI FRUITLANDS WHICH IS ALSO THE NW CORNER OF THE HARRIS RIVERVIEW HOME ADDITION;  
 THENCE N 89°59'00" E, ALONG THE NORTH LINE OF HARRIS RIVERVIEW HOME ADDITION AND THE SOUTH LINE OF LOTS 13 AND 4 OF BLOCK 3 OF ENTIAI FRUITLANDS, FOR 1141.20 FEET TO THE NE CORNER OF SAID HARRIS RIVERVIEW HOMES ADDITION;  
 THENCE NORTH 27°37'30" EAST FOR 251.34 FEET;  
 THENCE NORTH 51°58'00" WEST SAID RIGHT-OF-WAY LIMIT TO A POINT ON THE EASTERLY RIGHT-OF-WAY LIMIT OF THE OROVILLE BRANCH OF THE G.N. RAILWAY;  
 THENCE NORTHEASTERLY, ALONG SAID RIGHT-OF-WAY LIMIT OF SAID FRONTAGE ROAD, ON A CURVE LEFT, FOR 121.04 FEET TO A POINT WHICH IS NORTH 32°04'00" EAST OF, AND 121.00 FEET DISTANT FROM, THE POINT LAST DESCRIBED;  
 THENCE CONTINUING ALONG SAID FRONTAGE ROAD RIGHT-OF-WAY LIMIT AS FOLLOWS:  
 SOUTH 59°39'00" EAST FOR 14.20 FEET; NORTH 30°36'00" EAST FOR 296.38 FEET;  
 SOUTH 69°25'15" EAST FOR 15.07 FEET;  
 THENCE LEAVING SAID RIGHT-OF-WAY LIMIT, AND CONTINUING SOUTH 69°25'15" EAST FOR 206.72 FEET;  
 THENCE SOUTH 29°13'15" WEST FOR 711.18 FEET;  
 THENCE NORTH 62°22'30" WEST FOR 149.79 FEET TO THE TRUE POINT OF BEGINNING, ALL AS SHOWN ON MAP ATTACHED HERETO AND BY THIS REFERENCE MADE A PART HEREOF (WHICH AREA OUTLINED GREEN IS THE LAND BEING CONVEYED BY THE GRANTOR TO THE GRANTEE).  
 EXCEPT EASEMENTS AND/OR RIGHTS OF WAY FOR HIGHWAYS OR ROADWAYS, WATER PIPE LINES OR PUBLIC UTILITIES.  
 AND EXCEPT AN EASEMENT DATED MAY 10, 1960 TO INTERSTATE TELEPHONE COMPANY, ITS SUCCESSORS AND ASSIGNS FOR THE RIGHT TO ERECT, CONSTRUCT, RECONSTRUCT, OPERATE AND MAINTAIN TELEPHONE AND TELEGRAPH LINES CONSISTING OF WIRES, CABLES, POLES AND ASSOCIATED FIXTURES TO BE LOCATED OVER, ALONG, UNDER AND ACROSS THE FOLLOWING DESCRIBED PROPERTY IN CHELAN COUNTY, STATE OF WASHINGTON, TO-WIT:  
 LOT 11, BLOCK 2, ENTIAI FRUITLANDS, ACCORDING TO THE RECORDED PLAT THEREOF.  
 THE CENTERLINE OF THIS EASEMENT TO BE LOCATED AS FOLLOWS:  
 BEGINNING AT THE CENTER OF SECTION 9, TOWNSHIP 25 NORTH, RANGE 31 E. W.M.;  
 THENCE SOUTH ON THE NORTH-SOUTH CENTER LINE OF SAID SECTION FOR 1180 FEET, MORE OR LESS; THENCE LEFT 78 21' TO THE WEST LINE OF LOT 11, BLOCK 2 ABOVE DESCRIBED AND THE TRUE POINT OF BEGINNING; THENCE CONTINUING ON THE SAME BEARING TO THE COLUMBIA RIVER.  
 TOGETHER WITH THE RIGHT TO INSPECT SAID LINE AND TO TRIM BRUSH AND TREES THAT MAY INTERFERE WITH THE CONSTRUCTION, MAINTENANCE AND OPERATION OF SAME.

**OWNER:**  
 CITY OF ENTIAI  
 PO BOX 228  
 14870 KENZEL STREET  
 ENTIAI, WA 98822

**SITE ADDRESS:**  
 1947 LAKESHORE DR.  
 ENTIAI, WA 98822

**VERTICAL DATUM:**  
 STATE PLANE NAD 83

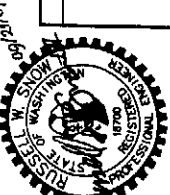
**DESIGNED BY:** RS  
**DRAWN BY:** MR. DG  
**CHECKED BY:** [Signature]  
**APPROVED BY:** [Signature]  
**DATE PRINTED:** 09/20/07  
**SCALE:** AS SHOWN  
**F.B. NO.:** 0523004-03

**REVISIONS**

NO.	DESCRIPTION	DATE
1	ISSUED FOR PERMITTING	09/20/07

**GENERAL NOTES**

1. THE CENTERLINE OF THIS EASEMENT TO BE LOCATED AS FOLLOWS:  
 BEGINNING AT THE CENTER OF SECTION 9, TOWNSHIP 25 NORTH, RANGE 31 E. W.M.;  
 THENCE SOUTH ON THE NORTH-SOUTH CENTER LINE OF SAID SECTION FOR 1180 FEET, MORE OR LESS; THENCE LEFT 78 21' TO THE WEST LINE OF LOT 11, BLOCK 2 ABOVE DESCRIBED AND THE TRUE POINT OF BEGINNING; THENCE CONTINUING ON THE SAME BEARING TO THE COLUMBIA RIVER.  
 TOGETHER WITH THE RIGHT TO INSPECT SAID LINE AND TO TRIM BRUSH AND TREES THAT MAY INTERFERE WITH THE CONSTRUCTION, MAINTENANCE AND OPERATION OF SAME.



**DESIGNED BY:** RS  
**DRAWN BY:** MR. DG  
**CHECKED BY:** [Signature]  
**APPROVED BY:** [Signature]  
**DATE PRINTED:** 09/20/07  
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**2007 WASTEWATER TREATMENT FACILITIES IMPROVEMENTS**

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**JOB NO.:** 0523004-03  
**DRAWING NO.:** G4  
**SHEET OF:**

**SITE SURVEY INFORMATION**

I. HYDRAULIC CRITERIA PHASE 1 & PHASE 2

PHASE 1 FLOWS	FLOW MGD	FLOW GPM	FLOW CFS
MINIMUM FLOW	0.05	35	0.08
DESIGN AVE FLOW	0.15	104	0.23
PEAK DAY FLOW	0.20	139	0.31
PEAK HOUR FLOW	0.48	333	0.74
PHASE 2 FLOWS			
MINIMUM FLOW	0.10	69	0.15
DESIGN AVE FLOW	0.30	208	0.45
PEAK DAY FLOW	0.40	278	0.62
PEAK HOUR FLOW	0.96	667	1.49

II. BAR SCREEN DESIGN CRITERIA

SIZE OF CLEAR OPENING BETWEEN BARS, INCH	1/2
MINIMUM SIZE OF BARS, INCHES	1/4 x 1
FLOW THROUGH THE SCREEN, MGD MAXIMUM	0.96
CHANNEL WIDTH, FEET	1
BAR RACK WIDTH, FEET	0.88
MAXIMUM DIFFERENTIAL HEAD ACROSS RACK, INCHES	6
APPROXIMATE RAKE SPEED, FPM	20

III. SETTLEABLE SOLIDS CONCENTRATOR DESIGN CRITERIA

THE SETTLEABLE SOLIDS CONCENTRATOR UNIT SHALL BE DESIGNED TO OPERATE UNDER THE FOLLOWING CONDITIONS:

AT PEAK HOUR FLOW OF 0.48 MGD WITH A HEADLOSS OF NO MORE THAN 12 INCHES, THE UNIT SHALL REMOVE MINIMUM 95% OF ALL GRIT EQUAL TO AND LARGER THAN 100 MICRON (SPECIFIC GRAVITY 2.6) IN SIZE.

IV. GRIT PUMP DESIGN CRITERIA

DESIGN CONDITION	FLOW GPM	TDH FT	MAX. PUMP RPM	SOLIDS PASSAGE	MIN. SUCTION DIA.	MIN. DISCH. DIA.	MIN. MOTOR SIZE
	220	25	900	3"	3"	3"	7.5 HP

V. SBR PERFORMANCE REQUIREMENTS CRITERIA

TREATMENT PLANT INFLUENT DATA	VALUE
ANNUAL AVERAGE FLOW	0.12 MGD
DESIGN (AVE. FOR MAXIMUM MONTH) FLOW	0.15 MGD
DESIGN PEAK DAY FLOW	0.20 MGD
DESIGN PEAK HOUR FLOW	0.48 MGD (333 GPM)
MINIMUM AVERAGE MONTH FLOW (STARTUP)	0.05 MGD
DESIGN BOD	302 PPD (240 MG/L)
DESIGN TSS	331 PPD (265 MG/L)
DESIGN NH3-N	NA
TKN	80 PPD (48 MG/L)
PHOSPHORUS	5.45 MG/L
ALKALINITY	330 MG/L
MINIMUM WASTEWATER TEMPERATURE	10 CENTIGRADE
MAXIMUM WASTEWATER TEMPERATURE	20 CENTIGRADE
SITE ELEVATION	710 FT.
TREATMENT PLANT EFFLUENT REQUIREMENTS	VALUE
BOD (AVERAGE WEEKLY)	45 MG/L
TSS (AVERAGE WEEKLY)	45 MG/L
BOD (AVERAGE MONTHLY)	30 MG/L
TSS (AVERAGE MONTHLY)	30 MG/L
NH3-N	NO EFFLUENT REQUIREMENT
WAS PRODUCTION	VALUE
PPD DRY SOLIDS PER BASIN PER DAY	98 PPD

PHASE	DESIGN FLOW*	NUMBER OF BASINS	PEAK DAY FLOW	PEAK HOUR FLOW
PHASE 1 FACILITY	0.15 MGD	2**	0.20 MGD	333 GPM (0.74 CFS)
PHASE 2 FACILITY	0.30 MGD	2	0.40 MGD	666 GPM (1.48 CFS)
ULTIMATE BUILDOUT	0.60 MGD	4	0.792 MGD	1,333 GPM (2.97 CFS)

\* AVERAGE FLOW FOR THE PEAK MONTH

\*\* INITIAL TWO (2) BASINS CONSTRUCTED AT THIS TIME WILL BE OPERATED AS A SINGLE BASIN IN PHASE 2 UPGRADE

VI. SBR PROCESS DESIGN CRITERIA

CRITERIA	VALUE
F/M	0.049 LB. BOD5/LB MLSS/DAY
S/M (AFTER 60 MINUTES SETTLING)	150 ML/G
MLSS AT BOTTOM WATER LEVEL	4,923 MG/L
WASTE SLUDGE PRODUCED (APPROX.)	197 LB/DAY
VOLUME OF SLUDGE PRODUCED (APPROX. 0.85% SOLIDS)	2,779 GPD
NORMAL DECANT RATE	351 GPM
PEAK DECANT RATE	500 GPM
HYDRAULIC RETENTION TIME	1.13 DAYS
SLUDGE AGE	26.36 DAYS
WASTEWATER TEMPERATURE	5-20°C
AMBIENT AIR TEMPERATURE	70-90°F
SITE ELEVATION	710 FT
NUMBER OF ICEAS BASINS	2
TOP WATER LEVEL	ELEV 725.0
BASIN WIDTH	15.0 FT
BASIN LENGTH	59.0 FT
BOTTOM WATER LEVEL	ELEV 722.43

VII. ULTRAVIOLET DISINFECTION EQUIPMENT

A. THE SYSTEM SHALL BE CAPABLE OF DELIVERING A UV DOSE OF 30 MJ/CM2, WITH ONE VESSEL IN OPERATION, AFTER 12,000 HOURS OF LAMP OPERATION, AT THE PEAK FLOW RATE, AND A MINIMUM UV TRANSMITTANCE OF 60% AT 253.7 NM.

B. THE UV DISINFECTION UNIT SHALL DELIVER THE MINIMUM UV INACTIVATION DOSE AT MAXIMUM FLOW CAPACITY, MINIMUM OPERATING TEMPERATURE, AND THE MINIMUM DESIGN UV TRANSMITTANCE, WITH LAMP OUTPUT ADJUSTED TO ACCOUNT FOR THE COMBINED LAMP DEGRADATION FACTOR TO SIMULATE THE END OF LAMP LIFE CONDITION. THE END OF LAMP LIFE IS BASED ON A LAMP AGING FACTOR EITHER DETERMINED FROM INDEPENDENT TESTING FOLLOWING NWRI GUIDELINES AND GUARANTEED BY THE UV SUPPLIER OR THE MINIMUM OF LAMP AGING FACTOR OF 80%. THE MINIMUM END OF LAMP LIFE IS OF THE NOMINAL LAMP OUTPUT, WHICH IS DEFINED AS THE FULL POWER AMP OUTPUT AFTER 100 HOUR OF LAMP OPERATION.

C. THE HEADLOSS THROUGH UV SYSTEM SHALL NOT EXCEED 8 INCHES AT DESIGN FLOW CONDITION.

D. THE PROJECT CONDITIONS SHALL BE AS FOLLOWS:

PEAK DESIGN FLOW:	351 GPM PER UNIT
NUMBER OF UNITS:	2
TOTAL SUSPENDED SOLIDS:	< 10 MG/L
IRON:	< 0.025 MG/L
MANGANESE:	< 0.005 MG/L
PH:	8-9
HARDNESS:	< 300 MG/L
ULTRAVIOLET TRANSMITTANCE @ 253.7 NM:	60%
WATER TEMPERATURE:	35°F TO 95°F
AMBIENT AIR TEMPERATURE:	30°F TO 86°F

VIII. PLANT WATER SYSTEM DESIGN CRITERIA

RATED FLOW 1	111.4 US GPM
MAXIMUM HEAD	319 FT.
MAXIMUM AMBIENT TEMPERATURE	104°F
SIZE, PIPE CONNECTION	2"
POWER (P2) REQUIRED BY PUMP	15 HP
MOTOR STARTER	2
NUMBER OF PUMPS	2
STORAGE WATER VOLUME	12,745 GALLONS

IX. MTS JET AERATION SYSTEM DESIGN

DESIGN PARAMETERS	VALUE	METRIC
PROCESS	OXIDATION DITCH	
NUMBER OF TANKS/BASINS	1	
TOTAL SOR	ENGLISH	
OXIDATION DITCH	14 LB. O2/HR	6.35 KG O2/HR
LENGTH	52 FT.	15.8 M
OUTSIDE DIAMETER OF SEMI-CIRCLE	27 FT.	3.2 M
CHANNEL WIDTH AT TOP	18 FT.	5.5 M
WALL SLOPE	1:1	
LIQUID DEPTH	4.1 FT	1.2 M
VOLUME PER TANK/BASIN	105,000 GAL	397 CUBIC M
DESIGN SUMMARY		
MTS JET AERATORS REQUIRED	1 @ MT2JM-6A	1 @ MT2JM-6A
LIQUID FLOW RATE PER AERATOR	1,560 GPM	98 L/S
TOTAL LIQUID FLOW RATE	1,560 GPM	98 L/S
LIQUID PRESSURE REQUIRED AT MANIFOLD 3	32 FT TDH	9.8 M TDH
TOTAL PUMP POWER 4	16 BHP	12 BkW
TOTAL POWER	16 BHP	12 BkW
CHANNEL VELOCITY	1.5 FT/SEC	0.45 M/SEC
STANDARD AERATION EFFICIENCY	0.88 LB. O2/BHP-HR	0.50 KG O2/BKW-H
POWER DENSITY	152 BHP/MG	30 BkW/1000 M3

X. DIGESTER DESIGN CRITERIA


DIGESTER DESIGN PARAMETER	VALUE
WAS MASS PRODUCTION (2 BASINS)	198 PPD
WAS PRODUCTION WITH 15% SF	230 PPD (DESIGN)
WAS CONC.	0.75% @ SG=1.005
WAS VOLUME PRODUCTION (2 BASINS)	3,660 GPD
PERCENT VOLATILE	80%
VS LOADING	184 PPD
DIGESTER VOLUME @ 4 FT DEPTH	90,900 GAL
VS LOADING RATE	0.03 LB VSS/FT <sup>3</sup> PER DAY
VS DESTRUCTION	50%
O2 REQUIREMENTS PER LB VSS DESTROYED	2.3 LB O2
AGR	212 PPD O2
SRT @ 4 FT DEPTH	> 60 DAYS

CALL THREE BUSINESS DAYS BEFORE YOU DIG  
1-800-424-5555

DESIGNED BY: RS  
DRAWN BY: DG  
CHECKED BY: *[Signature]*  
APPROVED BY: *[Signature]*  
DATE PRINTED: 09/20/07  
SCALE: NTS  
SHEET: 11/08/08

REVISIONS

GENERAL NOTES

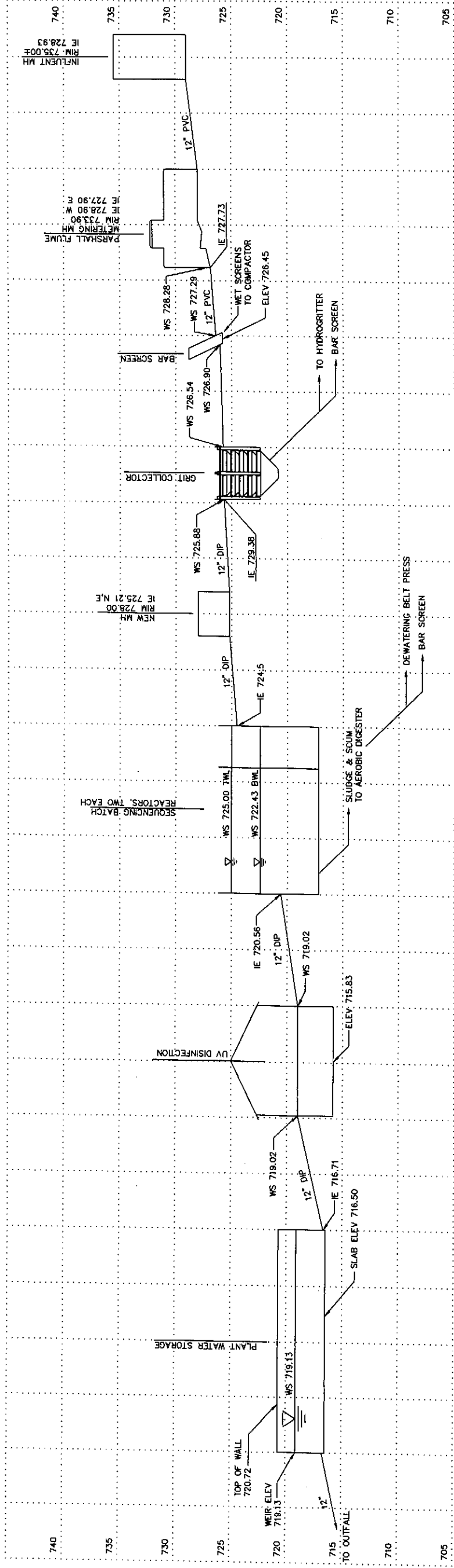


**HAMMOND COLLIER**  
WADE LIVINGSTONE

SEATTLE (206) 632-2664  
WENATCHEE (509) 662-1762  
OMAK (509) 826-5861  
LAKEWOOD (253) 472-1992

CITY OF ENTIAT  
2007 WASTEWATER TREATMENT FACILITIES IMPROVEMENTS  
FACILITY DESIGN CRITERIA

JOB NO. 0523004-03  
DRAWING NO. G5  
SHEET OF

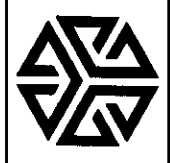


**SINGLE-LINE HYDRAULIC PROFILE**

SCALE: NOT TO SCALE HORIZONTAL  
1"=5' VERTICAL

JOB NO. 0523004-03  
DRAWING NO. G6  
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CITY OF ENTIAT  
2007 WASTEWATER TREATMENT  
FACILITIES IMPROVEMENTS  
HYDRAULIC PROFILE

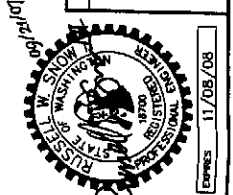


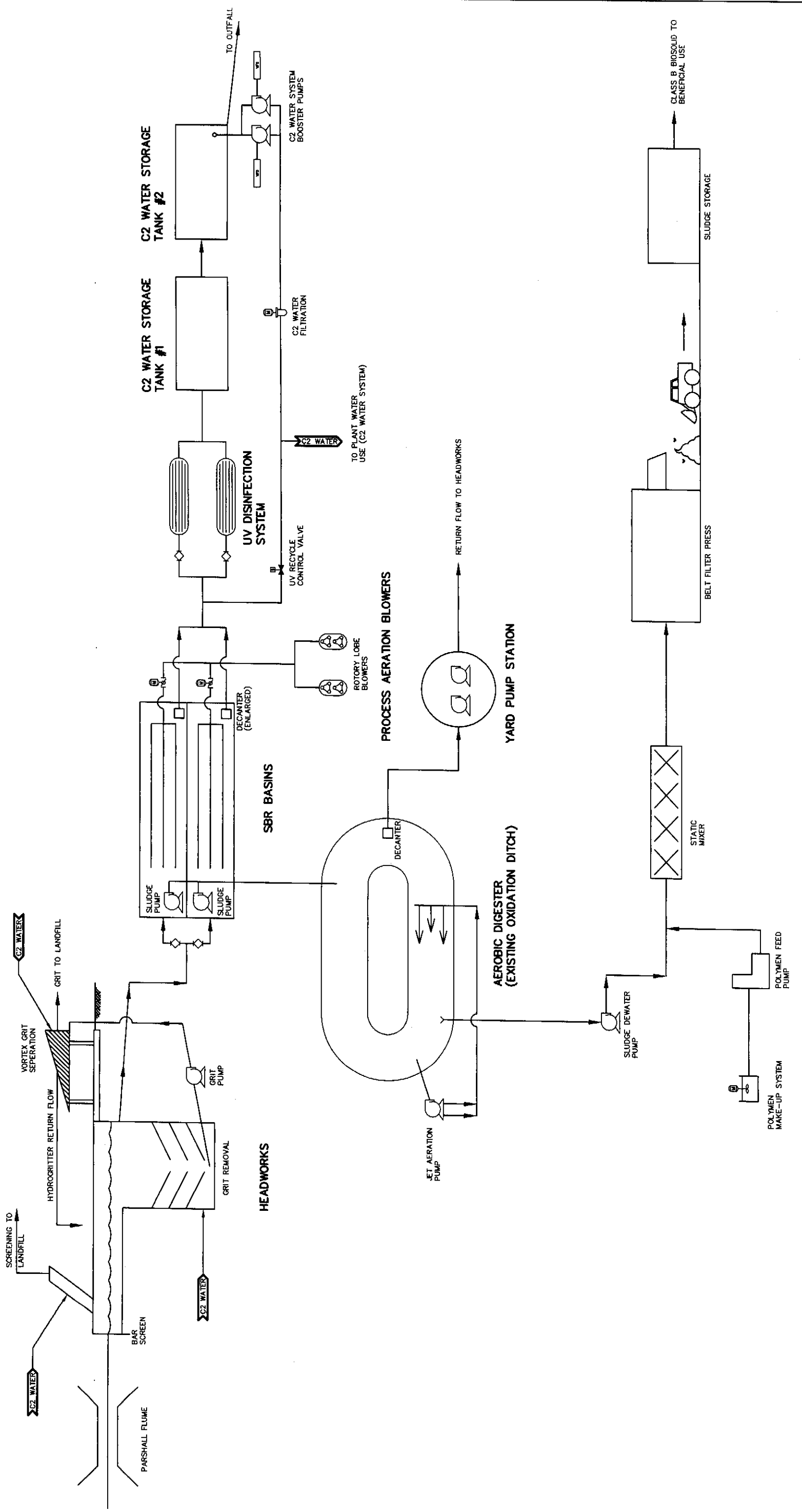
**HAMMOND COLLIER  
WADE LIVINGSTONE**  
SEATTLE (206) 632-2664  
OMAK (509) 836-3861  
WENATCHEE (509) 662-1762  
LAKEWOOD (253) 472-1992

DESIGNED BY RS  
DRAWN BY MR. DC  
CHECKED BY [Signature]  
APPROVED BY [Signature]  
DATE PRINTED: 09/20/07  
SCALE: AS SHOWN  
F.B. NO.: 0523004-03

GENERAL NOTES

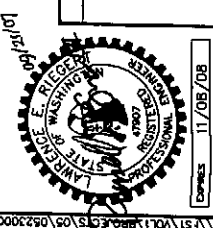
REVISIONS



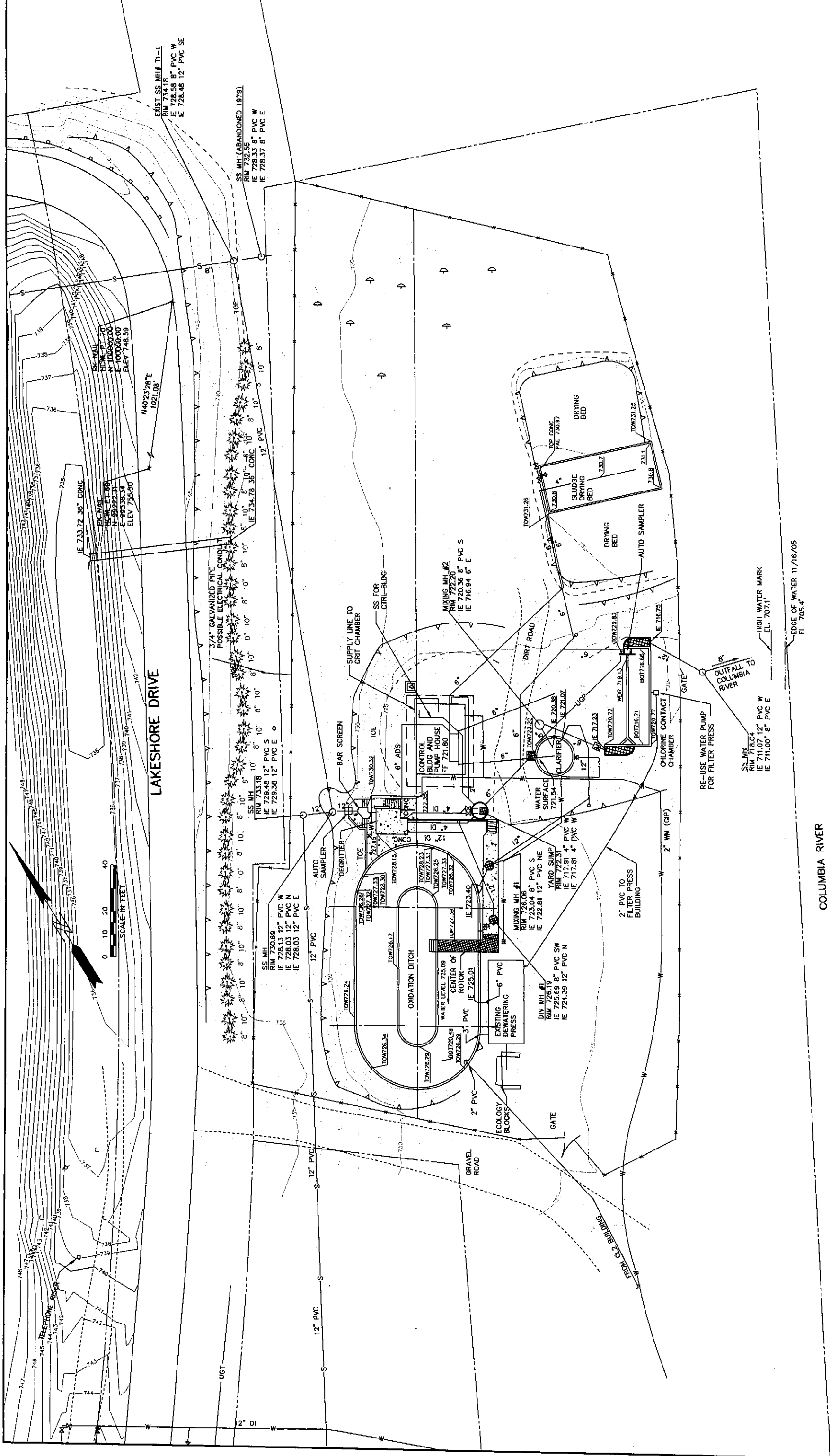


PLANT PROCESS FLOW DIAGRAM  
NOT TO SCALE

DESIGNED BY: RS DRAWN BY: MR. DG CHECKED BY: <i>[Signature]</i> APPROVED BY: DATE PRINTED: 09/20/07 SCALE: AS SHOWN F.B. NO.: 052.3004-03	GENERAL NOTES	REVISIONS	CITY OF ENTIAT 2007 WASTEWATER TREATMENT FACILITIES IMPROVEMENTS	JOB NO. 0523004-03
				DRAWING NO. G7
HAMMOND COLLIER WADE LIVINGSTONE			GENERALIZED FLOW DIAGRAM	SHEET OF
SEATTLE (206) 632-2664 WENATCHEE (509) 662-1762 OMAHA (509) 826-5861 LAKEWOOD (253) 472-1992				CLASS B BIOSOLID TO BENEFICIAL USE



F:\ST\1\1800\ES\105\0523004-03\DWG\07.DWG



EXIST. SS MH #1 TI-1  
 RIM 734.18  
 IE 728.58 8" PVC W  
 IE 728.48 12" PVC SE

SS MH (ABANDONED 1979)  
 RIM 732.25  
 IE 728.33 8" PVC W  
 IE 728.37 8" PVC E

PK MAIL  
 TOW 71.50  
 N 1000000.00  
 E 99522.31  
 ELEV 748.59

MIXING MH #2  
 RIM 722.20  
 IE 720.36 8" PVC S  
 IE 716.94 6" E

SS MH  
 RIM 733.18  
 IE 729.48 12" PVC S  
 IE 729.38 12" PVC E

SS MH  
 RIM 730.69  
 IE 728.13 12" PVC W  
 IE 728.03 12" PVC N  
 IE 728.03 12" PVC E

SS MH  
 RIM 718.04  
 IE 711.07 12" PVC W  
 IE 711.00 8" PVC E

SS MH #1  
 RIM 728.19  
 IE 724.89 6" PVC SW  
 IE 724.39 12" PVC N

SS MH #1  
 RIM 726.06  
 IE 723.04 8" PVC S  
 IE 722.81 12" PVC NE

SS MH #1  
 RIM 725.31  
 IE 717.81 4" PVC W  
 IE 717.81 4" PVC W

SCALE 1"=20'

0 10 20 40  
 SCALE IN FEET

PLAN  
 SCALE 1"=20'

COLUMBIA RIVER

EDGE OF WATER 11/16/05  
 EL. 705.4'

HIGH WATER MARK  
 EL. 707.1'

RE-USE WATER PUMP  
 FOR FILTER PRESS

GATE

OUTFALL TO  
 COLUMBIA RIVER

EL. 716.75'

TOE

SS FOR  
 CIRL-BLDG

SUPPLY LINE TO  
 GRIT CHAMBER

DIRT ROAD

WATER SURFACE  
 721.54

CHLORINE CONTACT  
 CHAMBER

2" PVC TO  
 FILTER PRESS  
 BUILDING

2" MM (GIP)

FROM C2 BUILDING

GATE

BAR SCREEN

CONTROL  
 PUMP AND  
 HOUSE  
 FF 71.80

6" ADS

CLARIFIER

6" PVC

EXISTING  
 DOWATERING  
 PRESS

6" PVC

EXISTING  
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