

**DEREK DIPIAZZA
CONSTRUCTION MANAGEMENT
CM FACULTY ADVISOR: DR. HORMAN
WARRENTON AQUATIC & RECREATION FACILITY
OLD WATERLOO ROAD
WARRENTON, VA 20186
OCTOBER 30, 2007**



TECHNICAL ASSIGNMENT #2

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EXECUTIVE SUMMARY

In technical assignment 2, the Warrenton Aquatic Recreation Center project is further defined and described through: a detailed project schedule, a site layout plan showing the construction of the structure sequence, a building envelope assemblies estimate, a detailed structural estimate, and finally a general conditions estimate.

The project schedule shows how the Warrenton facility will be constructed by trade. This particular breakdown of the schedule enables the construction manager to organize bid packs and scope coverage as well manage the site efficiently based on what trades will be on site during a particular interval of time. A chronological schedule and a trade schedule with relation lines are included in the appendix for reference.

The site layout plan will be used to show how the sequence of steel erection and concrete pours will be sequenced during the construction of the superstructure. These drawings are important because they will help organize the site and make the construction efficient. This is also a useful tool to relate the schedule to actual construction.

The assemblies estimate for the Warrenton Aquatic and Recreation facility that is contained in this report shows the cost of the building enclosure. To manufacture this estimate, takeoffs of the surface areas for the different building wall types were done and *Means Cost Works 2005* was used to generate a price based on the wall assembly. This enclosure estimate will be looked at further in future reports to analyze the cost and design.

The detailed structural estimate was compiled by doing quantity takeoffs of the structural steel and concrete. These quantities were then multiplied by their respective costs from *Means Cost Works 2005* to obtain the final price for each system. Also included for reference in this section is the original estimate broken down into division format for comparison purposes.

The final portion of this technical report details the general conditions estimate. To produce this total, the project staffing plan and site drawings were used to calculate a total cost for the necessary items to produce a successful project. Again, *Means Cost Works 2005* was used as well as actual costs from multiple industry members.

DETAILED PROJECT SCHEDULE

The Warrenton Aquatic and Recreation Center's schedule consists of 199 activities that are grouped into 33 categories by CSI division, trade, and company. The project was started on January 10, 2006 and is projected to finished and turned over on August 1, 2007. For the purposes of this assignment and also to help with the ease of legibility, relationship lines have been left off to make the schedule clearer. Also for your reference, a detailed chronological schedule is attached in appendix A to illustrate the proper sequence of how the building will be built.

Act ID	Activity Description	Orig Dur	Rem Dur	Early Start	Early Finish	Total Float	2006												2007												2008												
							JAN	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J						
WARRENTON AQUATICS AND RECR FACILITY																																											
ASPHALT																																											
			224	224	10MAY06	28MAR07	56d																																				
1430	RTE. 211 ACCESS RD. BASE	15	15	10MAY06	31MAY06	5d																																					
1420	WATERLOO ACCESS RDS & PARKING	35	35	01JUN06	20JUL06	5d																																					
1360	WATERLOO RD. IMPROVEMENTS	15	15	21JUL06	10AUG06	48d																																					
1400	ASPHALT TRAILS	20	20	25SEP06	20OCT06	8d																																					
1380	PARKING LOT/ACCESS ROAD FINAL	10	10	15MAR07	28MAR07	56d																																					
CABLE																																											
			5	5	10MAY06	16MAY06	40d																																				
1240	FIBER-OPTIC & CABLE SERVICE TO	5	5	10MAY06	16MAY06	40d																																					
CARPENTRY																																											
			275	275	29MAR06	26APR07	6d																																				
3725	SET CMU WALL DOOR FRAMES	65	65	29MAR06	28JUN06	60d																																					
3731	HANG EXTERIOR DOORS	5	5	06NOV06	10NOV06	21d																																					
3730	HANG INTERIOR DOORS	10	10	16MAR07	29MAR07	6d																																					
3740	INSTALL DOOR HARDWARE	20	20	30MAR07	26APR07	6d																																					
COLUMBIA GAS																																											
			5	5	03MAY06	09MAY06	20d																																				
1210	GAS SERVICE TO BLDG.	5	5	03MAY06	09MAY06	20d																																					
CONCRETE																																											
			285	285	15FEB06	29MAR07	5d																																				
2110	FOOTINGS - A-B	30	30	15FEB06	28MAR06	0																																					
2130	COMP POOL PIT, TANK & CATCH BASIN	10	10	15FEB06	28FEB06	9d																																					
2120	CONC. WALLS AND COLUMNS - A	25	25	22FEB06	28MAR06	9d																																					
2010	CONC WALLS AND COLUMNS - B	25	25	15MAR06	18APR06	20d																																					
2012	LEISURE POOL PUMP PIT WALLS AND	5	5	15MAR06	21MAR06	15d																																					
2135	VESTIBULE TOWER CONCRETE	10	10	15MAR06	28MAR06	9d																																					
2020	ELEVATOR PIT WALLS AND SLAB	5	5	22MAR06	28MAR06	20d																																					
2190	SLAB ON GRADE - A & B	20	20	29MAR06	25APR06	10d																																					
2200	DECK CONCRETE - A EAST	10	10	11MAY06	24MAY06	49d																																					
2090	DECK CONCRETE - B EAST	10	10	14JUN06	27JUN06	26d																																					
2240	COMPETITION POOL DECK CONCRETE	5	5	21FEB07	27FEB07	21d																																					

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Start date 10JAN06
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Calculate: Total
 Display: Quantity
 Interval: Month
 Total cumulative curve

- Early start point
- Early finish point
- Early bar
- Total float bar
- Progress bar
- Critical bar
- Summary bar
- Progress point
- Critical point
- Summary point
- Start milestone point
- Finish milestone point

Act ID	Activity Description	Orig Dur	Rem Dur	Early Start	Early Finish	Total Float	2006												2007												2008											
							JAN	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J					
2250	LEISURE POOL DECK CONCRETE	5	5	23MAR07	29MAR07	5d	▲▼ LEISURE POOL DECK CONCRETE																																			
DOMINION RESOURCES																																										
		160	160	05APR06	17NOV06	61d	▲▼																																			
1220	ELECTRIC & TEL. SERVICE TO BLDG.	15	15	05APR06	25APR06	20d	▲▼ ELECTRIC & TEL. SERVICE TO BLDG.																																			
1221	SET AND WIRE PERMANENT	10	10	06NOV06	17NOV06	61d	▲▼ SET AND WIRE PERMANENT TRANSFORMER																																			
DRYWALL																																										
		179	179	17JUL06	29MAR07	45d	▲▼																																			
3340	FRAME LIGHT MONITOR WINDOW	5	5	17JUL06	21JUL06	49d	▲▼ FRAME LIGHT MONITOR WINDOW OPENING, A																																			
3360	ROOF OVERBUILD, FRAME AND DECK, A	10	10	17JUL06	28JUL06	14d	▲▼ ROOF OVERBUILD, FRAME AND DECK, A																																			
3330	EXT. FURRING / SHEATHING - A NORTH	5	5	14AUG06	18AUG06	76d	▲▼ EXT. FURRING / SHEATHING - A NORTH																																			
3350	FRAME LIGHT MONITOR WINDOW	5	5	25AUG06	31AUG06	45d	▲▼ FRAME LIGHT MONITOR WINDOW OPENING, B																																			
3370	ROOF OVERBUILD, FRAME AND DECK, B	10	10	25AUG06	08SEP06	5d	▲▼ ROOF OVERBUILD, FRAME AND DECK, B																																			
3310	EXT. STUDS / SHEATHING - B SOUTH	10	10	25SEP06	06OCT06	8d	▲▼ EXT. STUDS / SHEATHING - B SOUTH																																			
3384	FRAME DRYWALL, B	15	15	30OCT06	17NOV06	47d	▲▼ FRAME DRYWALL, B																																			
3374	ACOUSTIC CEILING PANELS, COMPETITION POOL	5	5	20DEC06	27DEC06	21d	▲▼ ACOUSTIC CEILING PANELS, COMPETITION POOL																																			
3385	HANG AND FINISH DRYWALL A	45	45	05JAN07	08MAR07	37d	▲▼ HANG AND FINISH DRYWALL A																																			
3387	HANG AND FINISH DRYWALL, B	20	20	12JAN07	08FEB07	7d	▲▼ HANG AND FINISH DRYWALL, B																																			
3395	ACT GRID, B	2	2	12JAN07	15JAN07	67d	▲▼ ACT GRID, B																																			
3391	ACT GRID, A	5	5	24JAN07	30JAN07	37d	▲▼ ACT GRID, A																																			
3375	ACOUSTIC CEILING PANELS, LEISURE POOL	5	5	02FEB07	08FEB07	0	▲▼ ACOUSTIC CEILING PANELS, LEISURE POOL																																			
3372	METAL PAN CEILING GRID, UPPER LEVEL B	5	5	16FEB07	22FEB07	56d	▲▼ METAL PAN CEILING GRID, UPPER LEVEL B																																			
3373	METAL PAN CEILING PANELS, UPPER LEVEL B	5	5	09MAR07	15MAR07	46d	▲▼ METAL PAN CEILING PANELS, UPPER LEVEL B																																			
3396	ACT TILE, B	2	2	16MAR07	19MAR07	24d	▲▼ ACT TILE, B																																			
3392	ACT TILE A	8	8	20MAR07	29MAR07	45d	▲▼ ACT TILE A																																			
ELECTRICAL																																										
		352	352	08FEB06	26JUN07	20d	▲▼																																			
1060	TEMPORARY ELECTRIC	10	10	08FEB06	21FEB06	10d	▲▼ TEMPORARY ELECTRIC																																			
5560	CMU WALL ELECT ROUGH-IN	90	90	29MAR06	03AUG06	40d	▲▼ CMU WALL ELECT ROUGH-IN																																			
5520	SITE LIGHTING CONDUIT AND BASES	20	20	12APR06	09MAY06	5d	▲▼ SITE LIGHTING CONDUIT AND BASES																																			
5570	INSTALL SWITCHGEAR	10	10	21JUN06	05JUL06	83d	▲▼ INSTALL SWITCHGEAR																																			
5540	SITE LIGHT POLES	5	5	21JUL06	27JUL06	202d	▲▼ SITE LIGHT POLES																																			
5500	ELEC. CEILING ROUGH-IN, COMPETITION POOL	5	5	26SEP06	02OCT06	50d	▲▼ ELEC. CEILING ROUGH-IN, COMPETITION POOL																																			
5670	PENTHOUSE 1 LIGHTS	3	3	31OCT06	02NOV06	158d	▲▼ PENTHOUSE 1 LIGHTS																																			
5535	SET AND WIRE EMERGENCY GENERATOR	5	5	06NOV06	10NOV06	151d	▲▼ SET AND WIRE EMERGENCY GENERATOR																																			

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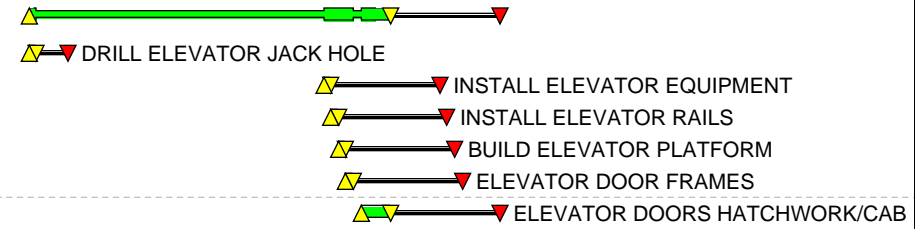
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- ▲ Progress point
- ▼ Critical point
- Summary point
- ◆ Start milestone point
- ◆ Finish milestone point

Act ID	Activity Description	Orig Dur	Rem Dur	Early Start	Early Finish	Total Float	2006												2007												2008													
							JAN	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J							
5590	ELEC. ROUGH-IN, B, UPPER LEVEL	5	5	06NOV06	10NOV06	47d																																						ELEC. ROUGH-IN, B, UPPER LEVEL
5510	ELEC. CEILING ROUGH-IN, LEISURE	5	5	14NOV06	20NOV06	24d																																						ELEC. CEILING ROUGH-IN, LEISURE POOL
5680	PENTHOUSE 2 LIGHTS	3	3	29NOV06	01DEC06	139d																																						PENTHOUSE 2 LIGHTS
5580	ELEC. ROUGH-IN, A, UPPER LEVEL	10	10	12JAN07	25JAN07	16d																																						ELEC. ROUGH-IN, A, UPPER LEVEL
5610	LIGHTS / DEVICES	35	35	07FEB07	27MAR07	84d																																						LIGHTS / DEVICES
5600	FIRE ALARM	60	60	23FEB07	17MAY07	22d																																						FIRE ALARM
5551	FIRE ALARM/SPRINKLER FINAL	5	5	20JUN07	26JUN07	0																																						FIRE ALARM/SPRINKLER FINAL INSPE

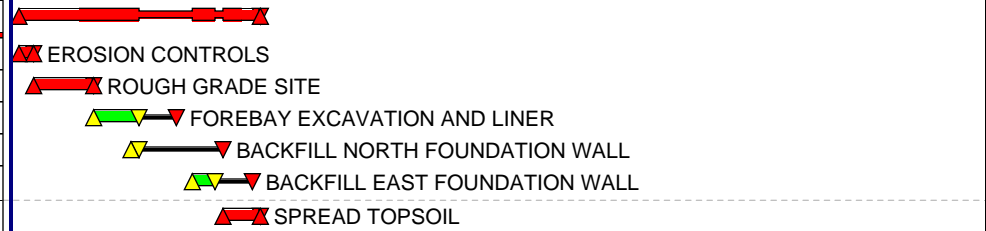
ELEVATOR

Act ID	Activity Description	Orig Dur	Rem Dur	Early Start	Early Finish	Total Float
		236	236	04APR06	08MAR07	72d
2002	DRILL ELEVATOR JACK HOLE	5	5	04APR06	10APR06	21d
2003	INSTALL ELEVATOR EQUIPMENT	5	5	05JAN07	11JAN07	72d
2004	INSTALL ELEVATOR RAILS	5	5	12JAN07	18JAN07	72d
2005	BUILD ELEVATOR PLATFORM	5	5	19JAN07	25JAN07	72d
2006	ELEVATOR DOOR FRAMES	5	5	26JAN07	01FEB07	72d
2007	ELEVATOR DOORS HATCHWORK/CAB	10	20	09FEB07	08MAR07	72d



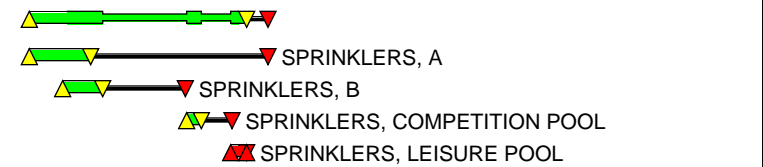
EXCAVATION

Act ID	Activity Description	Orig Dur	Rem Dur	Early Start	Early Finish	Total Float
		160	160	18JAN06	31AUG06	0
1040	EROSION CONTROLS	10	10	18JAN06	31JAN06	0
1300	ROUGH GRADE SITE	40	40	01FEB06	28MAR06	0
1310	FOREBAY EXCAVATION AND LINER	30	30	29MAR06	09MAY06	25d
1550	BACKFILL NORTH FOUNDATION WALL	5	5	03MAY06	09MAY06	55d
1551	BACKFILL EAST FOUNDATION WALL	15	15	29JUN06	20JUL06	25d
1560	SPREAD TOPSOIL	25	25	28JUL06	31AUG06	0



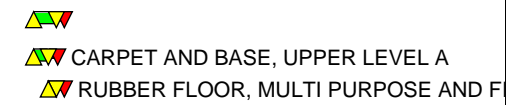
FIRE PROTECTION

Act ID	Activity Description	Orig Dur	Rem Dur	Early Start	Early Finish	Total Float
		140	140	25AUG06	15MAR07	15d
5820	SPRINKLERS, A	40	40	25AUG06	20OCT06	115d
5830	SPRINKLERS, B	27	27	25SEP06	31OCT06	52d
5800	SPRINKLERS, COMPETITION POOL	10	10	19JAN07	01FEB07	21d
5810	SPRINKLERS, LEISURE POOL	10	10	02MAR07	15MAR07	0



FLOOR COVERINGS

Act ID	Activity Description	Orig Dur	Rem Dur	Early Start	Early Finish	Total Float
		15	15	27APR07	17MAY07	6d
9050	CARPET AND BASE, UPPER LEVEL A	10	10	27APR07	10MAY07	6d
9051	RUBBER FLOOR, MULTI PURPOSE AND	5	5	11MAY07	17MAY07	6d



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Finish date	01AUG07		
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Act ID	Activity Description	Orig Dur	Rem Dur	Early Start	Early Finish	Total Float	2006												2007												2008											
							JAN	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J					
		398	398	10JAN06	01AUG07	0	[Gantt bar for total project duration]																																			
1010	MOBILIZE	10	10	10JAN06	23JAN06	0	[Gantt bar for MOBILIZE]																																			
3603	BUILDING WATERTIGHT	0	0		04JAN07	7d	[Gantt bar for BUILDING WATERTIGHT]																																			
1006	FINAL SITE INSPECTION	5	5	07MAY07	11MAY07	31d	[Gantt bar for FINAL SITE INSPECTION]																																			
1016	FINAL CLEAN	15	15	30MAY07	19JUN07	0	[Gantt bar for FINAL CLEAN]																																			
1011	FINAL BLD. INSP./ BLD. PERFORMANCE	5	5	27JUN07	03JUL07	0	[Gantt bar for FINAL BLD. INSP./ BLD. PERFORMANCE]																																			
1012	CERTIFICATE OF OCCUPANCY/SUB.	0	0		03JUL07	0	[Gantt bar for CERTIFICATE OF OCCUPANCY/SUB.]																																			
1014	PUNCHLIST	20	20	05JUL07	01AUG07	0	[Gantt bar for PUNCHLIST]																																			
1015	FINAL COMPLETION	0	0		01AUG07	0	[Gantt bar for FINAL COMPLETION]																																			
GLASS AND GLAZING																																										
		202	202	24JUL06	08MAY07	7d	[Gantt bar for GLASS AND GLAZING summary]																																			
3660	LIGHT MONITOR GLAZING, A	10	10	24JUL06	04AUG06	49d	[Gantt bar for LIGHT MONITOR GLAZING, A]																																			
3670	LIGHT MONITOR GLAZING, B	10	10	01SEP06	15SEP06	45d	[Gantt bar for LIGHT MONITOR GLAZING, B]																																			
3610	EXTERIOR STOREFRONT - BLDG A	20	20	16OCT06	10NOV06	21d	[Gantt bar for EXTERIOR STOREFRONT - BLDG A]																																			
3600	EXTERIOR STOREFRONT - BLDG. B	20	20	06NOV06	05DEC06	0	[Gantt bar for EXTERIOR STOREFRONT - BLDG. B]																																			
3620	INTERIOR STOREFRONT, A	5	15	12JAN07	01FEB07	26d	[Gantt bar for INTERIOR STOREFRONT, A]																																			
3640	INTERIOR STOREFRONT, B	10	10	23FEB07	08MAR07	46d	[Gantt bar for INTERIOR STOREFRONT, B]																																			
3651	MULTI-PURPOSE AND FITNESS ROOM	2	2	07MAY07	08MAY07	7d	[Gantt bar for MULTI-PURPOSE AND FITNESS ROOM]																																			
MECHANICAL HVAC																																										
		216	216	04AUG06	11JUN07	21d	[Gantt bar for MECHANICAL HVAC summary]																																			
5080	DUCT, A	30	30	04AUG06	15SEP06	71d	[Gantt bar for DUCT, A]																																			
5010	PENTHOUSE 1 DUCT	35	35	28AUG06	16OCT06	86d	[Gantt bar for PENTHOUSE 1 DUCT]																																			
5100	DUCT, B	30	30	01SEP06	13OCT06	47d	[Gantt bar for DUCT, B]																																			
5020	PENTHOUSE 1 MECHANICAL	5	5	26SEP06	02OCT06	86d	[Gantt bar for PENTHOUSE 1 MECHANICAL]																																			
5300	CONTROLS, A	90	90	03OCT06	09FEB07	86d	[Gantt bar for CONTROLS, A]																																			
5050	PENTHOUSE 2 DUCT	35	35	09OCT06	28NOV06	57d	[Gantt bar for PENTHOUSE 2 DUCT]																																			
5060	PENTHOUSE 2 MECHANICAL	5	5	06NOV06	10NOV06	57d	[Gantt bar for PENTHOUSE 2 MECHANICAL]																																			
5200	HVAC PIPING, A	60	60	06NOV06	01FEB07	62d	[Gantt bar for HVAC PIPING, A]																																			
5205	SET CHILLER CH-1	1	1	06NOV06	06NOV06	61d	[Gantt bar for SET CHILLER CH-1]																																			
5310	CONTROLS, B	90	90	13NOV06	22MAR07	57d	[Gantt bar for CONTROLS, B]																																			
5065	SET AND PIPE BOILERS	60	60	06DEC06	01MAR07	72d	[Gantt bar for SET AND PIPE BOILERS]																																			
5210	HVAC PIPING, B	60	60	06DEC06	01MAR07	42d	[Gantt bar for HVAC PIPING, B]																																			
5000	COMPETITION POOL DUCT	15	15	28DEC06	18JAN07	21d	[Gantt bar for COMPETITION POOL DUCT]																																			
5320	STARTUP PENTHOUSE 1 EQUIPMENT	10	10	19JAN07	01FEB07	21d	[Gantt bar for STARTUP PENTHOUSE 1 EQUIPMENT]																																			
5340	TEST AND BALANCE, A & COMP DUCT	30	30	02FEB07	15MAR07	62d	[Gantt bar for TEST AND BALANCE, A & COMP DUCT]																																			

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 Total cumulative curve

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Act ID	Activity Description	Orig Dur	Rem Dur	Early Start	Early Finish	Total Float	2006												2007												2008											
							JAN	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J					
5040	LEISURE POOL DUCT	15	15	09FEB07	01MAR07	0																																				
5330	STARTUP PENTHOUSE 2 EQUIPMENT	10	10	02MAR07	15MAR07	5d																																				
5350	TEST AND BALANCE, B & LEISURE DUCT	30	30	16MAR07	26APR07	32d																																				
5360	COMMISSION HVAC SYSTEMS	20	20	14MAY07	11JUN07	21d																																				
LANDSCAPING																																										
		136	136	30OCT06	11MAY07	31d																																				
1480	WOOD CHIP TRAIL	5	5	30OCT06	03NOV06	17d																																				
1490	SITE	30	30	02APR07	11MAY07	31d																																				
LOUVERS																																										
		34	34	17JUL06	31AUG06	92d																																				
3710	LOUVERS - A	5	5	17JUL06	21JUL06	121d																																				
3700	LOUVERS - B	5	5	25AUG06	31AUG06	92d																																				
MASONRY																																										
		160	160	29MAR06	10NOV06	42d																																				
2035	STAIR S-2 CMU TOWER	10	10	29MAR06	11APR06	29d																																				
7050	EXTERIOR CMU BACKUP	70	70	29MAR06	03AUG06	0																																				
7010	INTERIOR CMU WALLS, LOWER LVL	50	50	22JUN06	31AUG06	47d																																				
3110	STONE / BRICK VENEER	79	79	17JUL06	03NOV06	9d																																				
3601	EXTERIOR MASONRY CAULKING	5	5	06NOV06	10NOV06	42d																																				
MISCELLANEOUS METALS																																										
		189	189	09JUN06	08MAR07	72d																																				
2152	INSTALL STAIR 1 AND HANDRAIL	3	3	09JUN06	13JUN06	26d																																				
2151	INSTALL STAIR 2 AND HANDRAIL	5	5	14JUN06	20JUN06	46d																																				
2156	MOVEABLE PARTITION SUPPORT STEEL	2	2	06JUL06	07JUL06	101d																																				
2153	INSTALL EXTERIOR STAIR AND HANDRAIL	3	3	25SEP06	27SEP06	169d																																				
2155	SPECTATOR SEATING/GLASS HANDRAIL	20	20	09FEB07	08MAR07	52d																																				
2154	INSTALL ELEVATOR PIT LADDER	1	1	23FEB07	23FEB07	81d																																				
MILLWORK																																										
		24	24	23MAR07	25APR07	24d																																				
9153	FINISHING MILLWORK	18	18	23MAR07	17APR07	25d																																				
9156	POSTER CASES/STORAGE SHELVING	2	2	24APR07	25APR07	24d																																				
METAL SIDING																																										
		39	39	12SEP06	03NOV06	57d																																				

**FORRESTER CONSTRUCTION COMPANY
WARRENTON AQUATICS AND RECR FACILITY**

Start date	10JAN06
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Calculate: Total
Display: Quantity
Interval: Month
— Total cumulative curve

- Early start point
- Early finish point
- Early bar
- Total float bar
- Progress bar
- Critical bar
- Summary bar
- Progress point
- Critical point
- Summary point
- Start milestone point
- Finish milestone point





















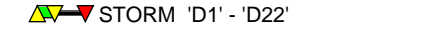

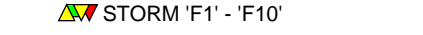



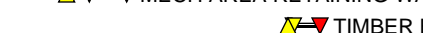



Act ID	Activity Description	Orig Dur	Rem Dur	Early Start	Early Finish	Total Float	2006												2007												2008											
							JAN	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J					
3430	METAL SIDING - A	20	20	12SEP06	09OCT06	76d	▲▼ METAL SIDING - A																																			
3410	METAL SIDING - B	20	20	09OCT06	03NOV06	8d	▲▼ METAL SIDING - B																																			
OWNER																																										
		0	0	10JAN06	10JAN06		▲																																			
1000	NOTICE TO PROCEED	0	0	10JAN06			◆ NOTICE TO PROCEED																																			
PAINT																																										
		105	105	13NOV06	12APR07	32d	▲▼																																			
6000	PAINT COMPETITION POOL AREA	40	40	13NOV06	11JAN07	21d	▲▼ PAINT COMPETITION POOL AREA																																			
6050	PAINT, B	30	30	20DEC06	01FEB07	12d	▲▼ PAINT, B																																			
6010	PAINT LEISURE POOL AREA	40	40	28DEC06	22FEB07	0	▲▼ PAINT LEISURE POOL AREA																																			
6040	PAINT, A	35	35	10JAN07	27FEB07	37d	▲▼ PAINT, A																																			
6100	PAINT PENTHOUSES	20	20	16MAR07	12APR07	32d	▲▼ PAINT PENTHOUSES																																			
PLUMBING																																										
		285	285	08MAR06	19APR07	25d	▲▼																																			
2013	INSTALL SEWER EJECTOR BASIN #2	5	5	08MAR06	14MAR06	15d	▲▼ INSTALL SEWER EJECTOR BASIN #2																																			
8000	UNDERGROUND PLUMBING ROUGH-IN, A	20	20	15MAR06	11APR06	10d	▲▼ UNDERGROUND PLUMBING ROUGH-IN, A EAST																																			
8020	DWV ROUGH-IN	53	53	11MAY06	26JUL06	76d	▲▼ DWV ROUGH-IN																																			
8050	UNDERGROUND PLUMBING ROUGH-IN,	5	5	19SEP06	25SEP06	118d	▲▼ UNDERGROUND PLUMBING ROUGH-IN, COMP PO																																			
8060	UNDERGROUND PLUMB ROUGH-IN,	5	5	14NOV06	20NOV06	84d	▲▼ UNDERGROUND PLUMB ROUGH-IN, LEISURE PO																																			
8090	INST. PLUMBING FIXTURES/TOILET	15	15	30MAR07	19APR07	25d	▲▼ INST. PLUMBING FIXTURES/TOILET ACCE																																			
POOLS																																										
		236	236	17JUL06	19JUN07	5d	▲▼																																			
4100	EXCAVATE COMPETITION POOL	10	10	17JUL06	28JUL06	24d	▲▼ EXCAVATE COMPETITION POOL																																			
4110	UNDERSLAB COMPETITION POOL PIPING	10	10	31JUL06	11AUG06	24d	▲▼ UNDERSLAB COMPETITION POOL PIPING																																			
4120	COMPETITION POOL CONCRETE SHELL	15	15	14AUG06	01SEP06	24d	▲▼ COMPETITION POOL CONCRETE SHELL																																			
4000	EXCAVATE LEISURE POOL	10	10	05SEP06	18SEP06	24d	▲▼ EXCAVATE LEISURE POOL																																			
4190	BACKFILL COMPETITION POOL WALLS	5	5	12SEP06	18SEP06	55d	▲▼ BACKFILL COMPETITION POOL WALLS																																			
4005	WATERSLIDE FOOTINGS AND PIERS	5	5	19SEP06	25SEP06	34d	▲▼ WATERSLIDE FOOTINGS AND PIERS																																			
4010	UNDERSLAB LEISURE POOL PIPING	15	15	19SEP06	09OCT06	24d	▲▼ UNDERSLAB LEISURE POOL PIPING																																			
4020	LEISURE POOL CONCRETE SHELL	20	20	10OCT06	06NOV06	24d	▲▼ LEISURE POOL CONCRETE SHELL																																			
4075	COMPETITION POOL FILTER ROOM	20	20	05JAN07	01FEB07	42d	▲▼ COMPETITION POOL FILTER ROOM EQUIP																																			
4070	LEISURE POOL FILTER ROOM	20	20	02FEB07	01MAR07	42d	▲▼ LEISURE POOL FILTER ROOM EQUIPMENT																																			
4140	TILE COMP POOL INTERIOR	20	20	28FEB07	27MAR07	21d	▲▼ TILE COMP POOL INTERIOR																																			
4040	INSTALL WATERSLIDE	20	20	30MAR07	26APR07	5d	▲▼ INSTALL WATERSLIDE																																			

**FORRESTER CONSTRUCTION COMPANY
WARRENTON AQUATICS AND RECR FACILITY**

Start date 10JAN06
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Calculate: Total
 Display: Quantity
 Interval: Month
 Total cumulative curve













- ▲ Early start point
- ▼ Early finish point
- Early bar
- ▬ Total float bar
- ▬ Progress bar
- ▬ Critical bar
- ▬ Summary bar
- ▲ Progress point
- ▼ Critical point
- Summary point
- ◆ Start milestone point
- ◆ Finish milestone point

Act ID	Activity Description	Orig Dur	Rem Dur	Early Start	Early Finish	Total Float	2006												2007												2008											
							JAN	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J					
4035	LEISURE POOL TILE	15	15	20APR07	10MAY07	0																																				
4150	COMP POOL PLASTER & FILL	8	8	25APR07	04MAY07	21d																																				
4045	INSTALL LEISURE POOL FEATURES	10	10	11MAY07	24MAY07	7d																																				
4048	LEISURE POOL PLASTER & FILL	12	12	11MAY07	29MAY07	0																																				
4180	STARTUP AND COMMISSION LEISURE &	10	10	30MAY07	12JUN07	0																																				
4181	FINAL HEALTH DEPT. INSPECTION	5	5	13JUN07	19JUN07	5d																																				
ROOFING																																										
		175	175	31JUL06	06APR07	59d																																				
3520	METAL ROOF - A EAST	20	20	31JUL06	25AUG06	14d																																				
3500	METAL ROOF - B EAST	20	20	11SEP06	06OCT06	5d																																				
3530	METAL ROOF - A WEST	25	25	09OCT06	10NOV06	5d																																				
3510	METAL ROOF - B WEST	25	25	13NOV06	19DEC06	5d																																				
3540	FLAT BUILT-UP ROOF	5	5	20DEC06	27DEC06	7d																																				
3550	GREEN ROOF MEMBRANE	5	5	28DEC06	04JAN07	7d																																				
3560	GREEN ROOF FILL AND PLANTS	5	5	02APR07	06APR07	59d																																				
SITE CONCRETE																																										
		261	261	17APR06	25APR07	33d																																				
1450	CURB AND GUTTER	15	15	17APR06	05MAY06	7d																																				
1454	ACCESS DRIVEWAY/SIDEWALKS, SOUTH	20	20	01MAR07	28MAR07	33d																																				
1452	CONCRETE PAVERS, WEST & NORTH	20	20	29MAR07	25APR07	33d																																				
SITE UTILITIES																																										
		73	73	08FEB06	19MAY06	42d																																				
1190	SANITARY '1A' - '1D' - BLDG.	15	15	08FEB06	28FEB06	10d																																				
1150	STORM 'D1' - 'D22'	13	13	01MAR06	17MAR06	20d																																				
1100	WATER LINES 'A' & 'B'	10	10	08MAR06	21MAR06	20d																																				
1160	STORM 'F1' - 'F10'	10	10	29MAR06	11APR06	5d																																				
1120	STORM 'A1' - 'A2' & 'C1' - 'C2'	8	8	10MAY06	19MAY06	42d																																				
SPECIALTY																																										
		290	290	29MAR06	17MAY07	22d																																				
9111	MECH AREA RETAINING WALL	15	15	29MAR06	18APR06	25d																																				
1470	TIMBER BRIDGE	5	5	23OCT06	27OCT06	17d																																				
9106	MECH AREA CHAIN LINK FENCE	1	1	02MAR07	02MAR07	76d																																				
9101	INTERIOR METAL BENCHES & LOCKERS	12	12	07MAR07	22MAR07	54d																																				
9104	TOILET PARTITIONS	5	5	23MAR07	29MAR07	25d																																				

FORRESTER CONSTRUCTION COMPANY
WARRENTON AQUATICS AND RECR FACILITY

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 Data date 10JAN06
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Calculate: Total
 Display: Quantity
 Interval: Month
 Total cumulative curve

-  Early start point
-  Early finish point
-  Total float bar
-  Total float bar
-  Progress bar
-  Critical bar
-  Summary bar
-  Progress point
-  Critical point
-  Summary point
-  Start milestone point
-  Finish milestone point

Act ID	Activity Description	Orig Dur	Rem Dur	Early Start	Early Finish	Total Float	2006												2007												2008											
							JAN	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J					
9108	INTERIOR SIGNAGE	5	5	11MAY07	17MAY07	7d	▲▼ INTERIOR SIGNAGE																																			
STRUCTURAL STEEL																																										
		94	94	13APR06	24AUG06	0	▲▼																																			
2160	STRUCTURAL STEEL - A EAST	20	20	13APR06	10MAY06	9d	▲▼ STRUCTURAL STEEL - A EAST																																			
2050	STRUCTURAL STEEL - B EAST	20	20	11MAY06	08JUN06	9d	▲▼ STRUCTURAL STEEL - B EAST																																			
2180	ROOF DECK - A EAST	10	10	11MAY06	24MAY06	24d	▲▼ ROOF DECK - A EAST																																			
2070	ROOF DECK - B EAST	10	10	09JUN06	22JUN06	14d	▲▼ ROOF DECK - B EAST																																			
2170	STRUCTURAL STEEL - A WEST	15	15	09JUN06	29JUN06	9d	▲▼ STRUCTURAL STEEL - A WEST																																			
2185	ROOF DECK - A WEST	10	10	30JUN06	14JUL06	9d	▲▼ ROOF DECK - A WEST																																			
2060	STRUCTURAL STEEL - B WEST	10	10	21JUL06	03AUG06	0	▲▼ STRUCTURAL STEEL - B WEST																																			
2075	ROOF DECK - B WEST	15	15	04AUG06	24AUG06	0	▲▼ ROOF DECK - B WEST																																			
SURVEY																																										
		58	58	10JAN06	30MAR06	9d	▲▼																																			
1020	SITE LIMITS AND BULDING CONTROL	5	5	10JAN06	16JAN06	0	▲▼ SITE LIMITS AND BULDING CONTROL SURVEY																																			
2150	FOUNDATION SURVEY - A & B	2	2	29MAR06	30MAR06	9d	▲▼ FOUNDATION SURVEY - A & B																																			
CERAMIC TILE																																										
		43	43	12JAN07	13MAR07	37d	▲▼																																			
9002	CERAMIC TILE FLOORS, LOWER LEVEL	5	5	12JAN07	18JAN07	75d	▲▼ CERAMIC TILE FLOORS, LOWER LEVEL B																																			
9001	CERAMIC TILE FLOORS, A	25	25	07FEB07	13MAR07	37d	▲▼ CERAMIC TILE FLOORS, A																																			
WATERPROOFING																																										
		110	110	05APR06	08SEP06	25d	▲▼																																			
3280	WATERPROOF EAST & NORTH	15	15	05APR06	25APR06	67d	▲▼ WATERPROOF EAST & NORTH FOUNDATION																																			
3290	DRAIN TILE - EAST & WEST	8	8	19APR06	28APR06	67d	▲▼ DRAIN TILE - EAST & WEST																																			
3250	AIR BARRIER - A WEST	5	5	26APR06	02MAY06	60d	▲▼ AIR BARRIER - A WEST																																			
3220	AIR BARRIER - B WEST	5	5	22JUN06	28JUN06	40d	▲▼ AIR BARRIER - B WEST																																			
3265	WATERPROOF SOUTH & EAST	5	5	22JUN06	28JUN06	25d	▲▼ WATERPROOF SOUTH & EAST FOUNDATION																																			
3295	DRAIN TILE - WEST & SOUTH	5	5	26JUN06	30JUN06	26d	▲▼ DRAIN TILE - WEST & SOUTH																																			
3230	AIR BARRIER - A EAST	5	5	11AUG06	17AUG06	25d	▲▼ AIR BARRIER - A EAST																																			
3200	AIR BARRIER - B EAST	5	5	01SEP06	08SEP06	25d	▲▼ AIR BARRIER - B EAST																																			
		398	398	10JAN06	01AUG07	0	▲▼																																			

**FORRESTER CONSTRUCTION COMPANY
WARRENTON AQUATICS AND RECR FACILITY**

Start date 10JAN06
 Finish date 01AUG07
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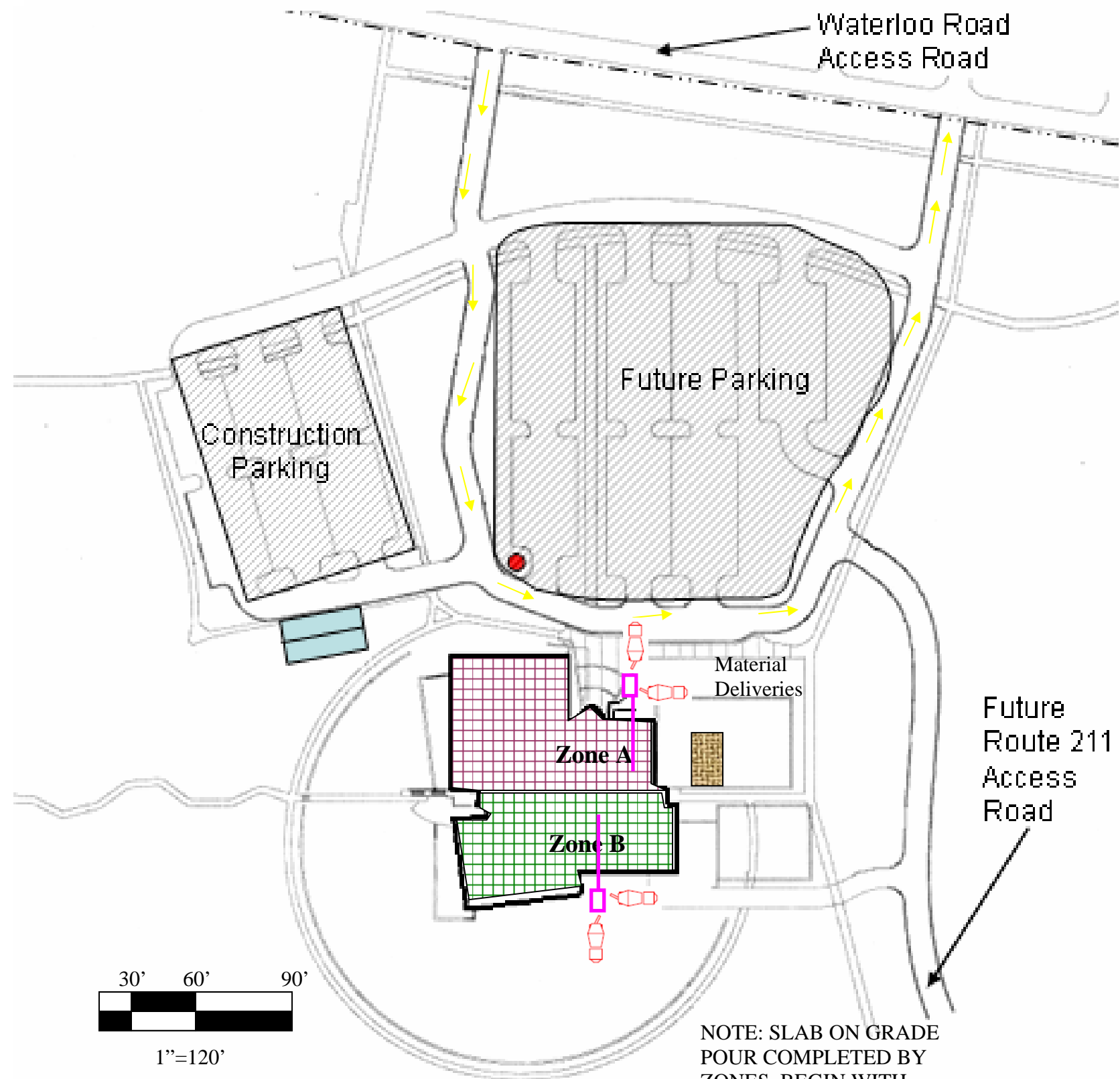
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 Interval: Month
 — Total cumulative curve

- ▲ Early start point
- ▼ Early finish point
- Early bar
- ▼ Total float point
- Total float bar
- Progress bar
- Critical bar
- Summary bar
- ▲ Progress point
- ▲ Critical point
- ▲ Summary point
- ◆ Start milestone point
- ◆ Finish milestone point












SITE LAYOUT PLAN

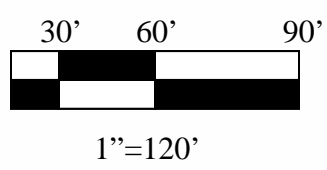
The following site plans will show that the site for the Warrenton Aquatic and Recreation Facility is favorable for all phases of construction. This is because the site is located in the middle of former recreational fields which provide the project with large amounts of open space for layout and storage. For the purposes of this technical assignment, the structural erection plan was highlighted to show how the project will be erected. As you can see in the plans, as well as the schedule, the construction is broken into zones, and then starting with the east of zone A, the structure will be set into place. It is important to note that while the erection of the last two zones do not appear to have total crane coverage, it is still possible for the steel to be set properly. This can be explained because the only major steel members that will need to be set in these two phases are the steel trusses that span the width of each building.

The following structural erection drawings along with the schedule can be used as a tool to visualize how the building will be erected, not only structurally but through all phases of construction.



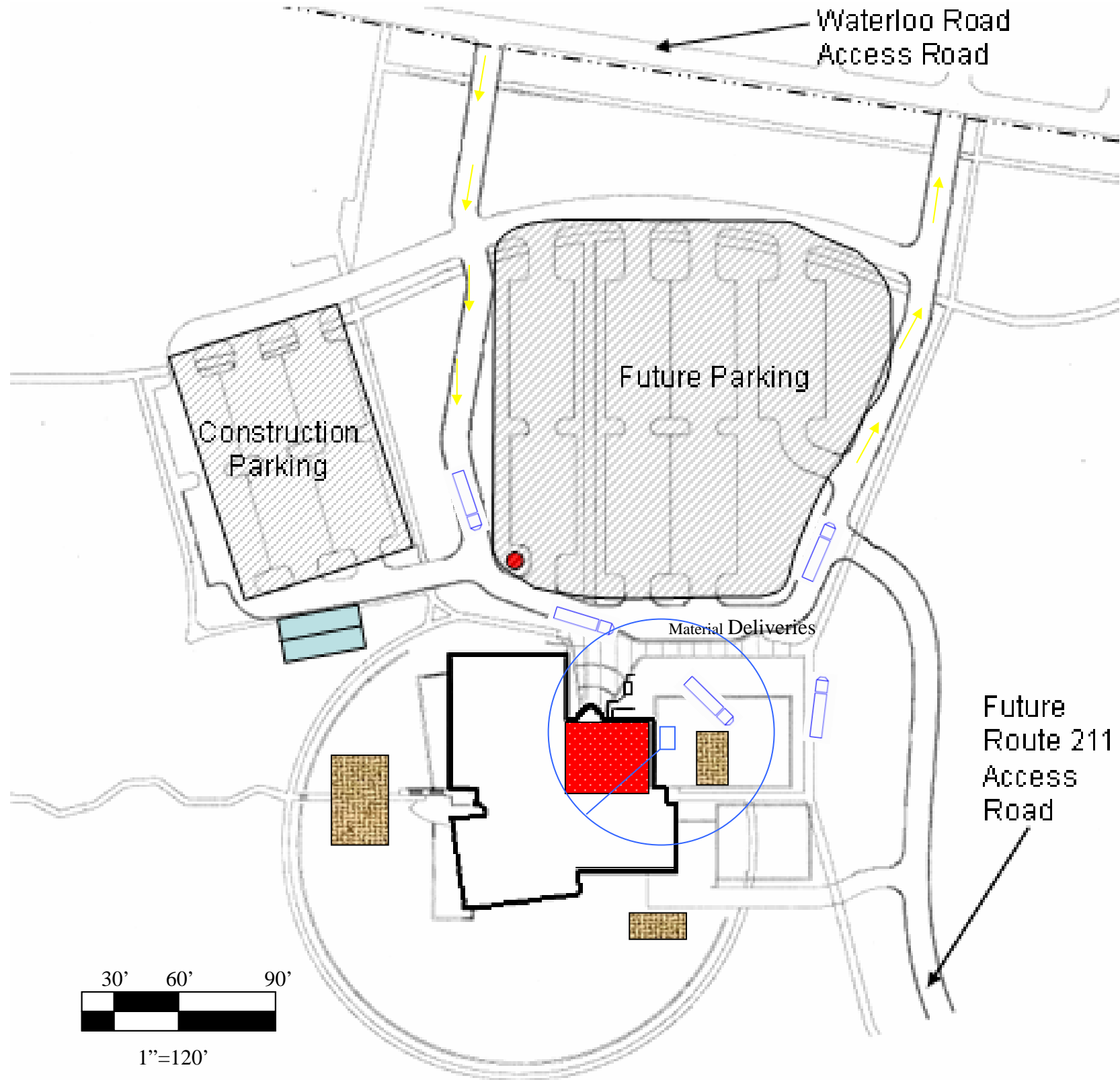
LEGEND

-  Concrete Truck
-  Steel Delivery Trailer
-  Site Trailer
-  Parking
-  Steel Delivery
-  Property Line
-  Fire Hydrant
-  Crawler Crane
-  Steel Shakeout
-  Erection Complete
-  Erection in Progress






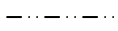







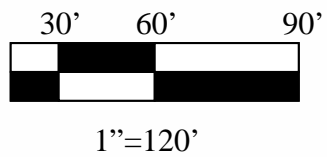
NOTE: SLAB ON GRADE
POUR COMPLETED BY
ZONES. BEGIN WITH
ZONE A

WARRENTON AQUATIC AND RECREATION FACILITY	
STRUCTURE SITE PLAN-SOG	
DATE: 10/30/06	APPD. BY:
DRAWN BY: DEREK DIPIAZZA	DWG. No. SE-1

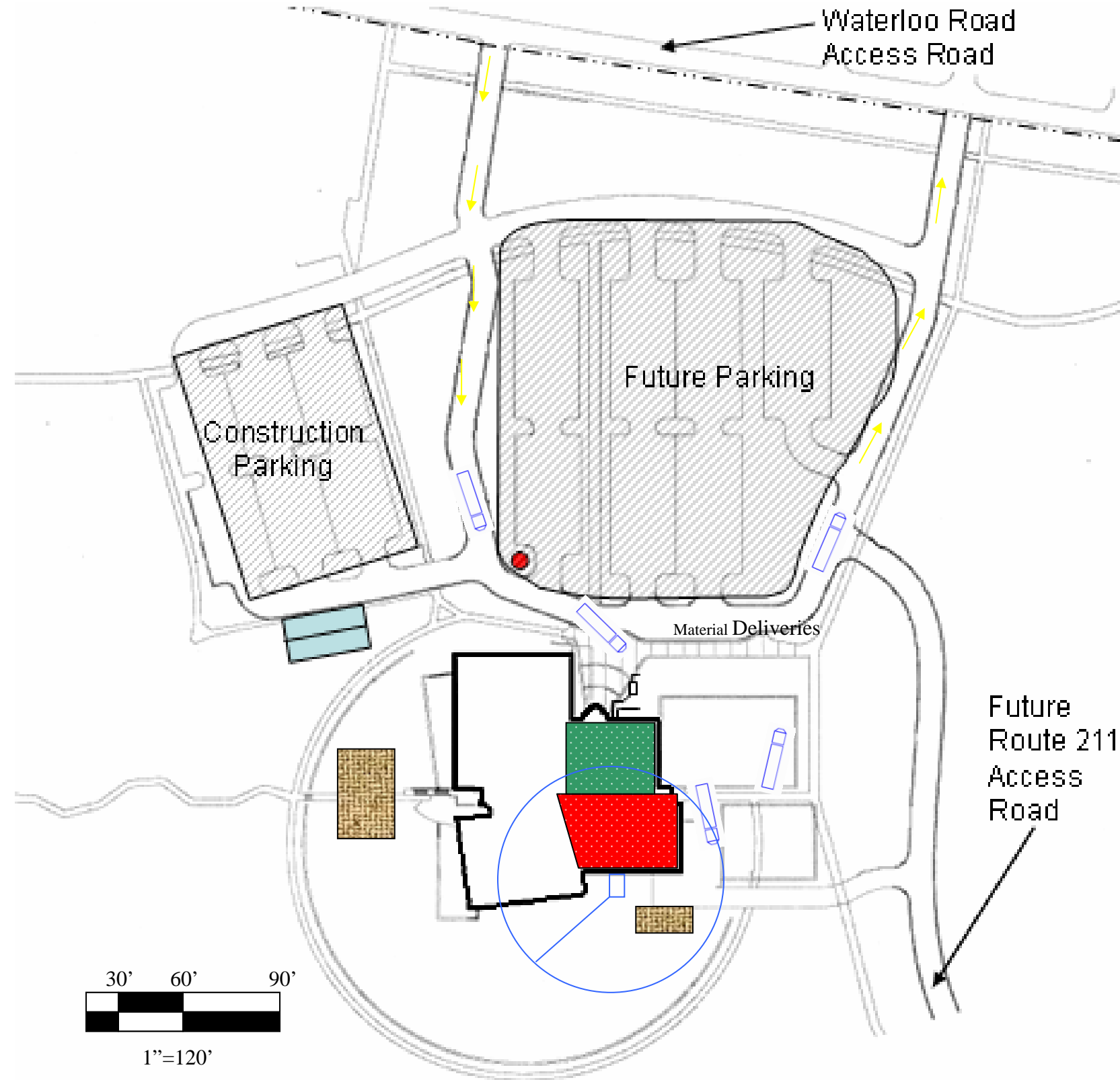


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






-  Concrete Truck
-  Steel Delivery Trailer
-  Site Trailer
-  Parking
-  Steel Delivery
-  Property Line
-  Fire Hydrant
-  Crawler Crane
-  Steel Shakeout
-  Erection Complete
-  Erection in Progress



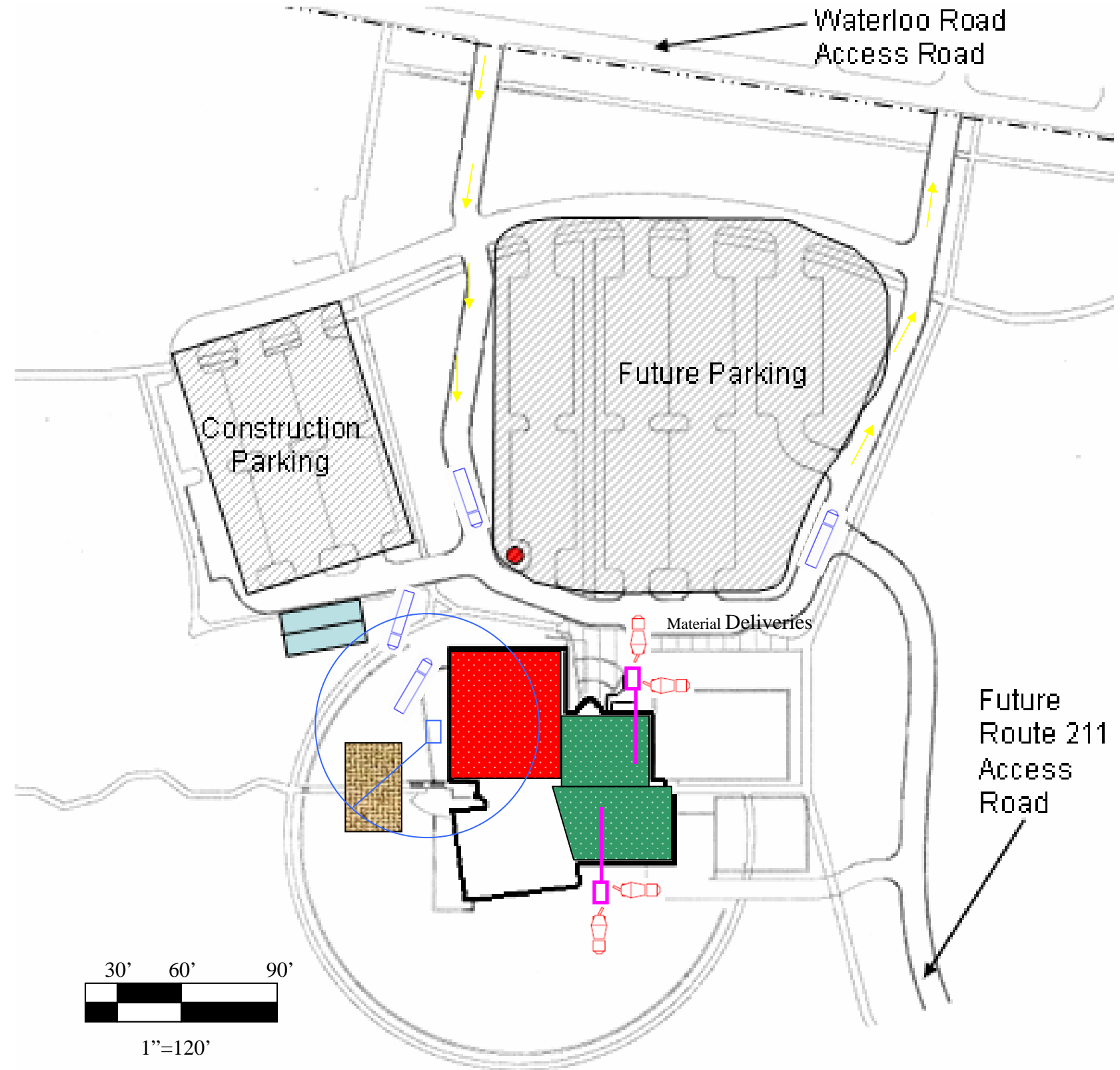
WARRENTON AQUATIC AND RECREATION FACILITY	
STRUCTURE SITE PLAN- STEEL 1	
DATE: 10/30/06	APPD. BY:
DRAWN BY: DEREK DIPIAZZA	DWG. No. SE-2














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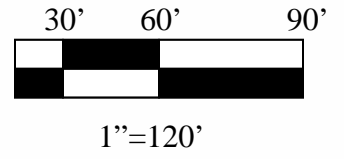
-  Concrete Truck
-  Steel Delivery Trailer
-  Site Trailer
-  Parking
-  Steel Delivery
-  Property Line
-  Fire Hydrant
-  Crawler Crane
-  Steel Shakeout
-  Erection Complete
-  Erection in Progress

WARRENTON AQUATIC AND RECREATION FACILITY	
STRUCTURE SITE PLAN- STEEL 2	
DATE: 10/30/06	APPD. BY:
DRAWN BY: DEREK DIPIAZZA	DWG. No. SE-3

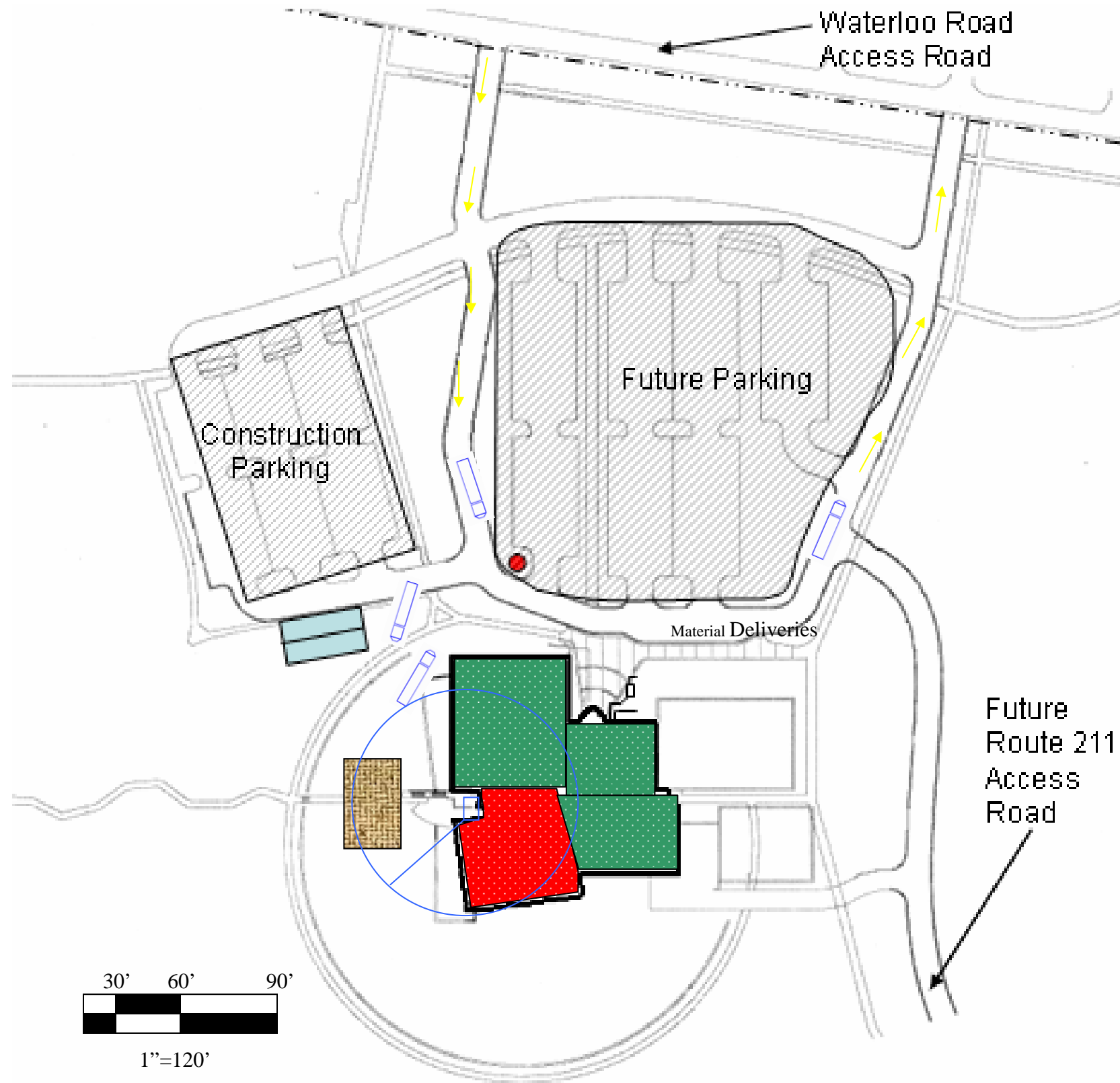


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





-  Concrete Truck
-  Steel Delivery Trailer
-  Site Trailer
-  Parking
-  Steel Delivery
-  Property Line
-  Fire Hydrant
-  Crawler Crane
-  Steel Shakeout
-  Erection Complete
-  Erection in Progress

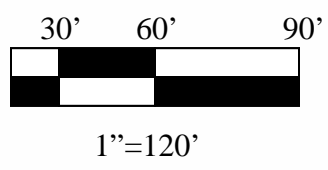


WARRENTON AQUATIC AND RECREATION FACILITY	
STRUCTURE SITE PLAN- STEEL 3	
DATE: 10/30/06	APPD. BY:
DRAWN BY: DEREK DIPIAZZA	DWG. No. SE-4



LEGEND

-  Concrete Truck
-  Steel Delivery Trailer
-  Site Trailer
-  Parking
-  Steel Delivery
-  Property Line
-  Fire Hydrant
-  Crawler Crane
-  Steel Shakeout
-  Erection Complete
-  Erection in Progress



WARRENTON AQUATIC AND RECREATION FACILITY	
STRUCTURE SITE PLAN- 4	
DATE: 10/30/06	APPD. BY:
DRAWN BY: DEREK DIPIAZZA	DWG. No. SE-5

ASSEMBLIES ESTIMATE

To assess the cost for the building envelope of the Warrenton Aquatic and Recreation Facility, an assemblies estimate was completed using *Means Cost Works 2005*. The building incorporates five major façade materials: Norman brick veneer, simulated stone veneer, glazed aluminum (curtain and storefront) window & door assemblies, and aluminum siding. For the roof, a standing seam metal roof is used over the metal decking and weather guard. The following is a summary of the estimate based on quantity takeoffs that can be found in appendix B.

Assemblies Estimate						
Material	Total (s.f.)	Material Cost	Material Total	Labor Cost	Labor Total	Total Cost
Brick Area	17666	\$7.90	\$139,561.40	\$14.10	\$249,090.60	\$388,652.00
Stone	1774	\$23.00	\$40,802.00	\$15.00	\$26,610.00	\$67,412.00
Metal Shingles	5422	\$2.21	\$11,982.62	\$1.91	\$10,356.02	\$22,338.64
Curtain Wall/Storefront Windows	9196	\$26.60	\$244,613.60	\$20.55	\$188,977.80	\$433,591.40
Siding	864	\$1.57	\$1,356.48	\$3.04	\$2,626.56	\$3,983.04
Standing Seam Metal Roof	37405	\$4.88	\$182,536.40	\$4.17	\$155,978.85	\$338,515.25
Totals	72327	\$66.16	\$620,852.50	\$58.77	\$633,639.83	\$1,254,492.33

DETAILED STRUCTURAL ESTIMATE

The following is a detailed estimate performed on the Warrenton Aquatic and Recreation Center's structural system. This estimate included the building's foundation, slabs, concrete and steel columns, steel beams, and roofing deck. The takeoffs can be seen in appendix C, with the following table summarizing the estimate for the structural system (cost values obtained from *Means Cost Works 2005*). Also included is the actual estimate from Technical Assignment 1 for reference purposes.

Estimate Summary					
Division	Total Cost	Division	Total Cost	Division	Total Cost
Metals		Concrete		Masonry	
Steel Beams	\$565,692.64	Slab On Grade	\$173,850.00	Backup Walls	\$200,200.50
Steel Columns	\$157,280.87	Elevated Slabs	\$54,648.00		
Steel Truss	\$176,368.68	Walls	\$626,332.42		
Metal Deck	\$160,056.00	Columns	\$24,528.37		
Roof Deck	\$83,787.20	Spread Footings	\$24,753.43		
		Continuous Footings	\$11,245.99		
Sub-Totals	\$1,143,185.39		\$915,358.21		\$200,200.50
Location Factor (1.03)	\$1,177,480.95		\$942,818.96		\$206,206.52
Waste Factor (5%)			\$47,140.95		\$10,310.33
Total	\$1,177,480.95		\$989,959.90		\$216,516.84

Warrenton Aquatic Actual Cost Data		
Description	Cost (\$)	Cost (\$)/ft2
Construction Cost	19,738,474	330.42
Total Project Cost	22,430,111	375.47
Building Systems	Cost (\$)	Cost (\$)/ft2
Site Work	\$ 2,000,000	33.48
Concrete	\$ 1,875,000	31.39
Masonry & Stone	\$ 2,350,000	39.34
Metals	\$ 2,300,000	38.50
Rough & Finish Carpentry	\$ 250,000	4.19
Thermal & Moisture Protection	\$ 800,000	13.39
D/F/H, Glass, Glazing, Windows	\$ 800,000	13.39
Drywall, Flooring, Finishes	\$ 720,000	12.05
Specialties	\$ 115,000	1.93
Equipment & Appliances	-	
Furnishings	\$ 180,000	3.01
Special Constructions	\$ 1,950,000	32.64
Conveying Systems	\$ 40,000	0.67
Plumbing, HVAC, Sprinkler Systems	\$ 4,900,000	82.03
Electrical Systems	\$ 1,400,000	23.44
Special Systems	\$ 16,000	0.27

STRUCTURAL ESTIMATE ANALYSIS

As you can see when comparing the concrete, masonry, and metals divisions, the estimate data is significantly lower than the actual costs. There are a few possible explanations for this. For concrete the estimate number does not take into account the site sidewalks, retaining walls, or curbs for the street. The masonry number is very low because the walls estimated were the only structural walls. The real estimate also incorporates the partition walls, stone veneer and sills, and brick veneer. The Metals number is off by over \$1 million mainly because miscellaneous metals are not part of the superstructure and therefore were not accounted for. Other possible explanations for the low estimate can be escalation of materials and labor cost and errors in assumptions and takeoffs.

GENERAL CONDITIONS ESTIMATE

The following is a breakdown of the general conditions for the Warrenton Aquatic and Recreation Center. The total general conditions cost for the project is roughly \$1,550,000 which accounts for 7% of the total project cost and is slightly lower than the normal of 10% for general conditions. Adding the general conditions cost together with the construction cost produces a total estimate of \$21,286,769 which is lower than the actual cost of the project. However, to account for the additional cost to reach the total of \$22,430,111, the CM Agent fee must still be applied.

General Conditions Estimate								
Category	Item	Quantity	Unit	Time (Months)	Unit Cost	Cost/Month	Total Cost	
Project Staffing								
	Project Executive	1	Ea.	6		\$10,400.00	\$62,400.00	
	Project Manager	1	Ea.	20		\$7,700.00	\$154,000.00	
	Assistant Project Manager	1	Ea.	20		\$5,600.00	\$112,000.00	
	Superintendent	1	Ea.	20		\$7,100.00	\$142,000.00	
	Field Engineer	1	Ea.	12		\$4,800.00	\$57,600.00	
	Intern	1	Ea.	6		\$3,000.00	\$18,000.00	
Temporary Utilities								
	Water	1	Ea.	19		\$200.00	\$3,800.00	
	Power	1	Ea.	19		\$500.00	\$9,500.00	
	Lighting	1	Ea.	12		\$65.00	\$780.00	
	Heating	1	Ea.	4		\$2,000.00	\$8,000.00	
	Toilets	4	Ea.	19		\$350.00	\$6,650.00	
Office Support								
	Trailer	2	Ea.	19		\$700.00	\$13,300.00	
	Maintain Field Office	1	Ea.	19		\$300.00	\$5,700.00	
	Office Cleaning	1	Ea.	19		\$200.00	\$3,800.00	
	Radios/Nextel's	6	Ea.	19		\$600.00	\$11,400.00	
	Telephone/Network Setup	1	LS	19	\$3,000.00		\$3,000.00	
	Telephone	1	Ea.	19		\$500.00	\$9,500.00	
	Office Furniture/Furnishings	1	LS	19	\$2,000.00		\$2,000.00	
	Fax Machines/Supplies	1	Ea.	19		\$300.00	\$5,700.00	
	Office and Miscellaneous Supplies	1	Ea.	19		\$600.00	\$11,400.00	
	Copier/Supplies	1	Ea.	19		\$1,200.00	\$22,800.00	
	Cameras/Film and Processing	1	Ea.	19		\$200.00	\$3,800.00	
	Drawing Reproduction	1	Ea.	19		\$800.00	\$15,200.00	
	Computers/Printers	5	LS	19	\$1,800.00		\$1,800.00	
	Postage/Overnight Express	1	Ea.	19		\$1,000.00	\$19,000.00	
Other								
	Dumpsters	2	Ea.	19		\$675.00	\$12,825.00	
	Periodic Clean-up	1	Mo.	19		\$900.00	\$17,100.00	
	Final Clean-up	1	LS		\$10,000.00		\$10,000.00	
Bonds/Insurance								
	Performance Bond	0.60%	Job	19	\$134,580.00		\$134,580.00	
	Builders Risk Insurance	0.24%	Job	19	\$53,832.00		\$53,832.00	
Fee								
	GC Fee	2.75%	Job		\$616,828.00		\$616,828.00	
				Totals		\$822,040.00	\$49,690.00	\$1,548,295.00

*The prices above were taken from R.S. Means 2005

**DEREK DIPIAZZA
CONSTRUCTION MANAGEMENT
CM FACULTY ADVISOR: DR. HORMAN
WARRENTON AQUATIC & RECREATION FACILITY
OLD WATERLOO ROAD
WARRENTON, VA 20186
OCTOBER 30, 2007**



TECHNICAL ASSIGNMENT #2

APPENDIX SUMMARY SHEET

APPENDIX A

CHRONOLOGICAL PROJECT SCHEDULE

APPENDIX B

ASSEMBLIES APPENDIX

APPENDIX C

STRUCTURAL ESTIMATE APPENDIX

Act ID	Activity Description	Orig Dur	Rem Dur	Early Start	Early Finish	2006												2007												2008											
						JAN	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M							
WARRENTON AQUATICS AND RECR FACILITY																																									
JAN06																																									
1000	NOTICE TO PROCEED	0	0	10JAN06 A		◆ NOTICE TO PROCEED																																			
1010	MOBILIZE	10	10	10JAN06	23JAN06	▲ MOBILIZE																																			
1020	SITE LIMITS AND BULDING CONTROL SURVEY	5	5	10JAN06	16JAN06	▲ SITE LIMITS AND BULDING CONTROL SURVEY																																			
1040	EROSION CONTROLS	10	10	18JAN06	31JAN06	▲ EROSION CONTROLS																																			
FEB06																																									
1300	ROUGH GRADE SITE	40	40	01FEB06	28MAR06	▲ ROUGH GRADE SITE																																			
1060	TEMPORARY ELECTRIC	10	10	08FEB06	21FEB06	▲ TEMPORARY ELECTRIC																																			
1190	SANITARY '1A' - '1D' - BLDG.	15	15	08FEB06	28FEB06	▲ SANITARY '1A' - '1D' - BLDG.																																			
2110	FOOTINGS - A-B	30	30	15FEB06	28MAR06	▲ FOOTINGS - A-B																																			
2130	COMP POOL PIT, TANK & CATCH BASIN	10	10	15FEB06	28FEB06	▲ COMP POOL PIT, TANK & CATCH BASIN																																			
2120	CONC. WALLS AND COLUMNS - A EAST/WEST	25	25	22FEB06	28MAR06	▲ CONC. WALLS AND COLUMNS - A EAST/WEST																																			
MAR06																																									
1150	STORM 'D1' - 'D22'	13	13	01MAR06	17MAR06	▲ STORM 'D1' - 'D22'																																			
1100	WATER LINES 'A' & 'B'	10	10	08MAR06	21MAR06	▲ WATER LINES 'A' & 'B'																																			
2013	INSTALL SEWER EJECTOR BASIN #2	5	5	08MAR06	14MAR06	▲ INSTALL SEWER EJECTOR BASIN #2																																			
2010	CONC WALLS AND COLUMNS - B EAST/WEST	25	25	15MAR06	18APR06	▲ CONC WALLS AND COLUMNS - B EAST/WEST																																			
2012	LEISURE POOL PUMP PIT WALLS AND SLAB	5	5	15MAR06	21MAR06	▲ LEISURE POOL PUMP PIT WALLS AND SLAB																																			
2135	VESTIBULE TOWER CONCRETE	10	10	15MAR06	28MAR06	▲ VESTIBULE TOWER CONCRETE																																			
8000	UNDERGROUND PLUMBING ROUGH-IN, A EAST	20	20	15MAR06	11APR06	▲ UNDERGROUND PLUMBING ROUGH-IN, A EAST																																			
2020	ELEVATOR PIT WALLS AND SLAB	5	5	22MAR06	28MAR06	▲ ELEVATOR PIT WALLS AND SLAB																																			
1160	STORM 'F1' - 'F10'	10	10	29MAR06	11APR06	▲ STORM 'F1' - 'F10'																																			
1310	FOREBAY EXCAVATION AND LINER	30	30	29MAR06	09MAY06	▲ FOREBAY EXCAVATION AND LINER																																			
2035	STAIR S-2 CMU TOWER	10	10	29MAR06	11APR06	▲ STAIR S-2 CMU TOWER																																			
2150	FOUNDATION SURVEY - A & B	2	2	29MAR06	30MAR06	▲ FOUNDATION SURVEY - A & B																																			
2190	SLAB ON GRADE - A & B	20	20	29MAR06	25APR06	▲ SLAB ON GRADE - A & B																																			
3725	SET CMU WALL DOOR FRAMES	65	65	29MAR06	28JUN06	▲ SET CMU WALL DOOR FRAMES																																			
5560	CMU WALL ELECT ROUGH-IN	90	90	29MAR06	03AUG06	▲ CMU WALL ELECT ROUGH-IN																																			
7050	EXTERIOR CMU BACKUP	70	70	29MAR06	03AUG06	▲ EXTERIOR CMU BACKUP																																			
9111	MECH AREA RETAINING WALL	15	15	29MAR06	18APR06	▲ MECH AREA RETAINING WALL																																			
APR06																																									
2002	DRILL ELEVATOR JACK HOLE	5	5	04APR06	10APR06	▲ DRILL ELEVATOR JACK HOLE																																			
1220	ELECTRIC & TEL. SERVICE TO BLDG.	15	15	05APR06	25APR06	▲ ELECTRIC & TEL. SERVICE TO BLDG.																																			
3280	WATERPROOF EAST & NORTH FOUNDATION	15	15	05APR06	25APR06	▲ WATERPROOF EAST & NORTH FOUNDATION																																			
5520	SITE LIGHTING CONDUIT AND BASES	20	20	12APR06	09MAY06	▲ SITE LIGHTING CONDUIT AND BASES																																			
2160	STRUCTURAL STEEL - A EAST	20	20	13APR06	10MAY06	▲ STRUCTURAL STEEL - A EAST																																			
1450	CURB AND GUTTER	15	15	17APR06	05MAY06	▲ CURB AND GUTTER																																			
3290	DRAIN TILE - EAST & WEST	8	8	19APR06	28APR06	▲ DRAIN TILE - EAST & WEST																																			
3250	AIR BARRIER - A WEST	5	5	26APR06	02MAY06	▲ AIR BARRIER - A WEST																																			
MAY06																																									

Act ID	Activity Description	Orig Dur	Rem Dur	Early Start	Early Finish	2006												2007												2008											
						JAN F M A M J J A S O N D												JAN F M A M J J A S O N D												JAN F M A M											
						J	A	S	O	N	D	J	A	S	O	N	D	J	A	S	O	N	D	J	A	M															
1210	GAS SERVICE TO BLDG.	5	5	03MAY06	09MAY06																																				
1550	BACKFILL NORTH FOUNDATION WALL	5	5	03MAY06	09MAY06																																				
1120	STORM 'A1' - 'A2' & 'C1' - 'C2'	8	8	10MAY06	19MAY06																																				
1240	FIBER-OPTIC & CABLE SERVICE TO BLDG.	5	5	10MAY06	16MAY06																																				
1430	RTE. 211 ACCESS RD. BASE	15	15	10MAY06	31MAY06																																				
2050	STRUCTURAL STEEL - B EAST	20	20	11MAY06	08JUN06																																				
2180	ROOF DECK - A EAST	10	10	11MAY06	24MAY06																																				
2200	DECK CONCRETE - A EAST	10	10	11MAY06	24MAY06																																				
8020	DWV ROUGH-IN	53	53	11MAY06	26JUL06																																				
JUN06																																									
1420	WATERLOO ACCESS RDS & PARKING BASE	35	35	01JUN06	20JUL06																																				
2070	ROOF DECK - B EAST	10	10	09JUN06	22JUN06																																				
2152	INSTALL STAIR 1 AND HANDRAIL	3	3	09JUN06	13JUN06																																				
2170	STRUCTURAL STEEL - A WEST	15	15	09JUN06	29JUN06																																				
2090	DECK CONCRETE - B EAST	10	10	14JUN06	27JUN06																																				
2151	INSTALL STAIR 2 AND HANDRAIL	5	5	14JUN06	20JUN06																																				
5570	INSTALL SWITCHGEAR	10	10	21JUN06	05JUL06																																				
3220	AIR BARRIER - B WEST	5	5	22JUN06	28JUN06																																				
3265	WATERPROOF SOUTH & EAST FOUNDATION	5	5	22JUN06	28JUN06																																				
7010	INTERIOR CMU WALLS, LOWER LVL	50	50	22JUN06	31AUG06																																				
3295	DRAIN TILE - WEST & SOUTH	5	5	26JUN06	30JUN06																																				
1551	BACKFILL EAST FOUNDATION WALL	15	15	29JUN06	20JUL06																																				
2185	ROOF DECK - A WEST	10	10	30JUN06	14JUL06																																				
JUL06																																									
2156	MOVEABLE PARTITION SUPPORT STEEL	2	2	06JUL06	07JUL06																																				
3110	STONE / BRICK VENEER	79	79	17JUL06	03NOV06																																				
3340	FRAME LIGHT MONITOR WINDOW OPENING, A	5	5	17JUL06	21JUL06																																				
3360	ROOF OVERBUILD, FRAME AND DECK, A	10	10	17JUL06	28JUL06																																				
3710	LOUVERS - A	5	5	17JUL06	21JUL06																																				
4100	EXCAVATE COMPETITION POOL	10	10	17JUL06	28JUL06																																				
1360	WATERLOO RD. IMPROVEMENTS	15	15	21JUL06	10AUG06																																				
2060	STRUCTURAL STEEL - B WEST	10	10	21JUL06	03AUG06																																				
5540	SITE LIGHT POLES	5	5	21JUL06	27JUL06																																				
3660	LIGHT MONITOR GLAZING, A	10	10	24JUL06	04AUG06																																				
1560	SPREAD TOPSOIL	25	25	28JUL06	31AUG06																																				
3520	METAL ROOF - A EAST	20	20	31JUL06	25AUG06																																				
4110	UNDERSLAB COMPETITION POOL PIPING	10	10	31JUL06	11AUG06																																				
AUG06																																									
2075	ROOF DECK - B WEST	15	15	04AUG06	24AUG06																																				
5080	DUCT, A	30	30	04AUG06	15SEP06																																				
3230	AIR BARRIER - A EAST	5	5	11AUG06	17AUG06																																				
3330	EXT. FURRING / SHEATHING - A NORTH	5	5	14AUG06	18AUG06																																				

Act ID	Activity Description	Orig Dur	Rem Dur	Early Start	Early Finish	2006												2007												2008											
						JAN	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M							
4120	COMPETITION POOL CONCRETE SHELL	15	15	14AUG06	01SEP06																																				
3350	FRAME LIGHT MONITOR WINDOW OPENING, B	5	5	25AUG06	31AUG06																																				
3370	ROOF OVERBUILD, FRAME AND DECK, B	10	10	25AUG06	08SEP06																																				
3700	LOUVERS - B	5	5	25AUG06	31AUG06																																				
5820	SPRINKLERS, A	40	40	25AUG06	20OCT06																																				
5010	PENTHOUSE 1 DUCT	35	35	28AUG06	16OCT06																																				
SEP06																																									
3200	AIR BARRIER - B EAST	5	5	01SEP06	08SEP06																																				
3670	LIGHT MONITOR GLAZING, B	10	10	01SEP06	15SEP06																																				
5100	DUCT, B	30	30	01SEP06	13OCT06																																				
4000	EXCAVATE LEISURE POOL	10	10	05SEP06	18SEP06																																				
3500	METAL ROOF - B EAST	20	20	11SEP06	06OCT06																																				
3430	METAL SIDING - A	20	20	12SEP06	09OCT06																																				
4190	BACKFILL COMPETITION POOL WALLS	5	5	12SEP06	18SEP06																																				
4005	WATERSLIDE FOOTINGS AND PIERS	5	5	19SEP06	25SEP06																																				
4010	UNDERSLAB LEISURE POOL PIPING	15	15	19SEP06	09OCT06																																				
8050	UNDERGROUND PLUMBING ROUGH-IN, COMP	5	5	19SEP06	25SEP06																																				
1400	ASPHALT TRAILS	20	20	25SEP06	20OCT06																																				
2153	INSTALL EXTERIOR STAIR AND HANDRAILS	3	3	25SEP06	27SEP06																																				
3310	EXT. STUDS / SHEATHING - B SOUTH	10	10	25SEP06	06OCT06																																				
5830	SPRINKLERS, B	27	27	25SEP06	31OCT06																																				
5020	PENTHOUSE 1 MECHANICAL EQUIPMENT	5	5	26SEP06	02OCT06																																				
5500	ELEC. CEILING ROUGH-IN, COMPETITION POOL	5	5	26SEP06	02OCT06																																				
OCT06																																									
5300	CONTROLS, A	90	90	03OCT06	09FEB07																																				
3410	METAL SIDING - B	20	20	09OCT06	03NOV06																																				
3530	METAL ROOF - A WEST	25	25	09OCT06	10NOV06																																				
5050	PENTHOUSE 2 DUCT	35	35	09OCT06	28NOV06																																				
4020	LEISURE POOL CONCRETE SHELL	20	20	10OCT06	06NOV06																																				
3610	EXTERIOR STOREFRONT - BLDG A	20	20	16OCT06	10NOV06																																				
1470	TIMBER BRIDGE	5	5	23OCT06	27OCT06																																				
1480	WOOD CHIP TRAIL	5	5	30OCT06	03NOV06																																				
3384	FRAME DRYWALL, B	15	15	30OCT06	17NOV06																																				
5670	PENTHOUSE 1 LIGHTS	3	3	31OCT06	02NOV06																																				
NOV06																																									
1221	SET AND WIRE PERMANENT TRANSFORMER	10	10	06NOV06	17NOV06																																				
3600	EXTERIOR STOREFRONT - BLDG. B	20	20	06NOV06	05DEC06																																				
3601	EXTERIOR MASONRY CAULKING	5	5	06NOV06	10NOV06																																				
3731	HANG EXTERIOR DOORS	5	5	06NOV06	10NOV06																																				
5060	PENTHOUSE 2 MECHANICAL EQUIPMENT	5	5	06NOV06	10NOV06																																				
5200	HVAC PIPING, A	60	60	06NOV06	01FEB07																																				

ASSEMBLIES ESTIMATE TAKEOFFS

Material Totals	
Material Totals	Total Area
Brick Area	17666
Stone	1774
Metal Shingles	5422
Window	6194
Siding	864

Enclosure Takeoffs					
North	Area	West	Area	South	Area
Brick Area	5400	Brick Area	3118	Brick Area	5200
Stone	216	Stone	628	Stone	600
Metal Shingles	1024	Metal Shingles	0	Metal Shingles	1300
Window	1943	Window	1576	Window	1820
Interior North		East		Interior South	
Brick Area	528	Brick Area	3084	Brick Area	336
Stone	88	Stone	186	Stone	56
Metal Shingles	1076	Metal Shingles	992	Metal Shingles	1030
Window	413	Window	288	Window	154
Siding	432			Siding	432

STRUCTURAL ESTIMATE

Structural Steel Beam Takeoff										
Member	Total Length (ft)	Weight (lbs)	Tons	Cost/Ton	Member Cost	Labor Unit Cost	Labor Cost/Member	Equip. Cost/Ton	Equip. Cost	Total Cost
W27X84	54	4501	2.25	\$2,600	\$5,850.94	\$480.00	\$1,080.17	\$151.50	\$340.93	\$7,272.04
W26X26	18	468	0.23	\$2,600	\$608.40	\$480.00	\$112.32	\$151.50	\$35.45	\$756.17
W24X62	19	1167	0.58	\$2,600	\$1,517.70	\$480.00	\$280.19	\$151.50	\$88.44	\$1,886.32
W24X55	110	6050	3.03	\$2,600	\$7,865.00	\$480.00	\$1,452.00	\$151.50	\$458.29	\$9,775.29
W24X50	20	1000	0.50	\$2,600	\$1,300.00	\$480.00	\$240.00	\$151.50	\$75.75	\$1,615.75
W21X50	50	2500	1.25	\$2,600	\$3,250.00	\$480.00	\$600.00	\$151.50	\$189.38	\$4,039.38
W21X44	654	27720	13.86	\$2,600	\$36,036.00	\$480.00	\$6,652.80	\$151.50	\$2,099.79	\$44,788.59
W18X71	22	1562	0.78	\$2,600	\$2,030.60	\$480.00	\$374.88	\$151.50	\$118.32	\$2,523.80
W18X65	22	1425	0.71	\$2,600	\$1,852.24	\$480.00	\$341.95	\$151.50	\$107.93	\$2,302.12
W18X60	94	5694	2.85	\$2,600	\$7,402.20	\$480.00	\$1,366.56	\$151.50	\$431.32	\$9,200.08
W18X50	120	6000	3.00	\$2,600	\$7,800.00	\$480.00	\$1,440.00	\$151.50	\$454.50	\$9,694.50
W18X40	926	37047	18.52	\$2,600	\$48,160.84	\$480.00	\$8,891.23	\$151.50	\$2,806.30	\$59,858.37
W18X35	353	12370	6.18	\$2,600	\$16,080.61	\$480.00	\$2,968.73	\$151.50	\$937.00	\$19,986.34
W16X50	110	5500	2.75	\$2,600	\$7,150.00	\$480.00	\$1,320.00	\$151.50	\$416.63	\$8,886.63
W16X31	548	16988	8.49	\$2,600	\$22,084.40	\$480.00	\$4,077.12	\$151.50	\$1,286.84	\$27,448.36
W16X26	171	4435	2.22	\$2,600	\$5,765.60	\$480.00	\$1,064.42	\$151.50	\$335.96	\$7,165.98
W14X30	111	3343	1.67	\$2,600	\$4,345.38	\$480.00	\$802.22	\$151.50	\$253.20	\$5,400.81
W14x22	21	462	0.23	\$2,600	\$600.60	\$480.00	\$110.88	\$151.50	\$35.00	\$746.48
W12X50	180	9000	4.50	\$2,600	\$11,700.00	\$480.00	\$2,160.00	\$151.50	\$681.75	\$14,541.75
W12X45	153	6907	3.45	\$2,600	\$8,979.17	\$480.00	\$1,657.69	\$151.50	\$523.21	\$11,160.07
W12X40	260	10400	5.20	\$2,600	\$13,520.00	\$480.00	\$2,496.00	\$151.50	\$787.80	\$16,803.80
W12X35	240	8400	4.20	\$2,600	\$10,920.00	\$480.00	\$2,016.00	\$151.50	\$636.30	\$13,572.30
W12X26	490	12727	6.36	\$2,600	\$16,545.10	\$480.00	\$3,054.48	\$151.50	\$964.07	\$20,563.65
W12x22	77	1685	0.84	\$2,600	\$2,190.19	\$480.00	\$404.34	\$151.50	\$127.62	\$2,722.15
W12X19	897	17048	8.52	\$2,600	\$22,162.08	\$480.00	\$4,091.46	\$151.50	\$1,291.37	\$27,544.90
W12X16	367	5873	2.94	\$2,600	\$7,634.64	\$480.00	\$1,409.47	\$151.50	\$444.86	\$9,488.98
W12X14	1170	16386	8.19	\$2,600	\$21,301.64	\$480.00	\$3,932.61	\$151.50	\$1,241.23	\$26,475.49
W8X24	72	1728	0.86	\$2,600	\$2,246.40	\$480.00	\$414.72	\$151.50	\$130.90	\$2,792.02
W8X31	22	682	0.34	\$2,600	\$886.60	\$480.00	\$163.68	\$151.50	\$51.66	\$1,101.94
W8X18	220	3960	1.98	\$2,600	\$5,148.00	\$480.00	\$950.40	\$151.50	\$299.97	\$6,398.37
W8X15	100	1500	0.75	\$2,600	\$1,950.00	\$480.00	\$360.00	\$151.50	\$113.63	\$2,423.63
W8X13	293	3813	1.91	\$2,600	\$4,957.28	\$480.00	\$915.19	\$151.50	\$288.86	\$6,161.32
W8X10	70	700	0.35	\$2,600	\$910.00	\$480.00	\$168.00	\$151.50	\$53.03	\$1,131.03
HSS8X4X.375	3716	101818	50.91	\$2,600	\$132,363.92	\$480.00	\$24,436.42	\$151.50	\$7,712.74	\$164,513.08
C8X11.5	412	4738	2.37	\$2,600	\$6,159.40	\$480.00	\$1,137.12	\$151.50	\$358.90	\$7,655.42
C12X20.7	22	455.4	0.23	\$2,600	\$592.02	\$480.00	\$109.30	\$151.50	\$34.50	\$735.81
C12X30	102	3060	1.53	\$2,600	\$3,978.00	\$480.00	\$734.40	\$151.50	\$231.80	\$4,944.20
C15X50	20	1000	0.50	\$2,600	\$1,300.00	\$480.00	\$240.00	\$151.50	\$75.75	\$1,615.75
Totals	12307	350111	175	\$2,600	455145	\$480	84027	\$151.50	26521	\$565,692.64

STRUCTURAL ESTIMATE

Structural Steel Column Takeoff										
Member	Total Length (ft)	Total Weight (lbs)	Tons	Cost/Ton	Member Cost	Labor Unit Cost	Labor Cost/Member	Equipment Cost/Ton	Equipment Cost	Total Cost
W8X24	410	9840	4.92	\$2,600	\$12,792.00	\$480.00	\$2,361.60	\$151.50	\$745.38	\$15,898.98
W12X96	812	77952	38.976	\$2,600	\$101,337.60	\$480.00	\$18,708.48	\$151.50	\$5,904.86	\$125,950.94
W8x31	100	3100	1.55	\$2,600	\$4,030.00	\$480.00	\$744.00	\$151.50	\$234.83	\$5,008.83
W10X39	138	5382	2.691	\$2,600	\$6,996.60	\$480.00	\$1,291.68	\$151.50	\$407.69	\$8,695.97
W10X33	38	1254	0.627	\$2,600	\$1,630.20	\$480.00	\$300.96	\$151.50	\$94.99	\$2,026.15
Totals	1498	97528	48.764	\$2,600	\$126,786.40	\$480.00	\$23,406.72	\$151.50	\$7,387.75	\$157,580.87

Steel Truss Takeoff											
Member	Total Length (ft)	Total Weight (lbs)	Tons	Cost/Ton	Member Cost	Labor Unit Cost	Labor Cost Per Member	Equip. Cost/Ton	Equip. Cost	Total Truss	Total Cost
HSS12X8X.5	115	7164.5	3.58	\$2,750.00	\$9,851.19	\$332.00	\$1,189.31	\$156.00	\$558.83	8	\$92,794.60
HSS8X8X.375	38.5	1447.6	0.72	\$2,750.00	\$1,990.45	\$332.00	\$240.30	\$156.00	\$112.91	8	\$18,749.32
HSS8X4X.375	60	1644.0	0.82	\$2,750.00	\$2,260.50	\$332.00	\$272.90	\$156.00	\$128.23	8	\$21,293.09
PIPE 4.0	82	885.6	0.44	\$2,750.00	\$1,217.70	\$332.00	\$147.01	\$156.00	\$69.08	8	\$11,470.29
PIPE 5.0	124	1810.4	0.91	\$2,750.00	\$2,489.30	\$332.00	\$300.53	\$156.00	\$141.21	8	\$23,448.30
PIPE 6.0	35	665.0	0.33	\$2,750.00	\$914.38	\$332.00	\$110.39	\$156.00	\$51.87	8	\$8,613.08
Totals	454.5	13617.1	6.81	\$2,750.00	\$18,723.51	\$332.00	\$2,260.44	\$156.00	1062.1338	8	\$176,368.68

Metal Decking Takeoff									
Item	Quantity (s.f.)	Cost/s.f.	Total Material Cost	Labor Unit Cost	Total Labor Cost	Equipment Cost/Unit	Equipment Cost	Total Cost	
3" Composite Steel Floor Deck	21,600	\$6.45	\$139,320.00	\$0.90	\$19,440.00	\$0.06	\$1,296.00	\$160,056.00	
3" Steel Roof Deck 20 gauge	37,405	\$1.88	\$70,321.40	\$0.34	\$12,717.70	\$0.02	\$748.10	\$83,787.20	

Concrete Flooring Takeoff								
Item	Quantity (s.f.)	Cost/s.f.	Total Material Cost	Labor Unit Cost	Total Labor Cost	Equipment Cost/Unit	Equipment Cost	Total Cost
SOG 6" Fiber Reinforced Concrete w/WWF, Vapor Barrier, Stone	35,625	\$2.41	\$85,856.25	\$2.20	\$78,375.00	\$0.27	\$9,618.75	\$173,850.00
6" Elevated Slab	21,600	\$1.61	\$34,776.00	\$0.65	\$14,040.00	\$0.27	\$5,832.00	\$54,648.00
Totals	57,225	\$4.02	\$120,632.25	\$2.85	\$92,415.00	\$0.54	\$15,450.75	\$228,498.00

Concrete Column Footing Takeoff										
Concrete Column Spread Footings	Volume (CY)	Amount	Concrete Volume (CY)	Cost/CY	Material Cost	Labor Unit Cost	Total Labor Cost	Equipment Unit Cost	Equipment Cost	Total Cost
5'X5"X1'2"	1.08	3	3.24	\$86.00	\$278.64	\$28.55	\$92.50	\$11.55	\$37.42	\$408.56
6'X6"X1'4"	1.77	15	26.55	\$86.00	\$2,283.30	\$28.55	\$758.00	\$11.55	\$306.65	\$3,347.96
7'X7"X1'8"	3.03	13	39.39	\$86.00	\$3,387.54	\$28.55	\$1,124.58	\$11.55	\$454.95	\$4,967.08
8'X8"X1'10"	4.35	2	8.7	\$86.00	\$748.20	\$28.55	\$248.39	\$11.55	\$100.49	\$1,097.07
Totals	10.23	33	77.88	\$86.00	\$6,697.68	\$28.55	\$2,223.47	\$11.55	\$899.51	\$9,820.67

STRUCTURAL ESTIMATE

Estimate Summary					
Division	Total Cost	Division	Total Cost	Division	Total Cost
Metals		Concrete		Masonry	
Steel Beams	\$565,692.64	Slab On Grade	\$173,850.00	Backup Walls	\$200,200.50
Steel Columns	\$157,280.87	Elevated Slabs	\$54,648.00		
Steel Truss	\$176,368.68	Walls	\$626,332.42		
Metal Deck	\$160,056.00	Columns	\$24,528.37		
Roof Deck	\$83,787.20	Spread Footings	\$24,753.43		
		Continuous Footings	\$11,245.99		
Sub-Totals	\$1,143,185.39		\$915,358.21		\$200,200.50
Location Factor (1.03)	\$1,177,480.95		\$942,818.96		\$206,206.52
Waste Factor (5%)			\$47,140.95		\$10,310.33
Total	\$1,177,480.95		\$989,959.90		\$216,516.84