

Montana Department of Fish, Wildlife, and Parks  
 Bluewater Hatchery Settling Basin Replacement  
 Near Bridger, Montana  
 FWP Project No. 7193139



*This Project*

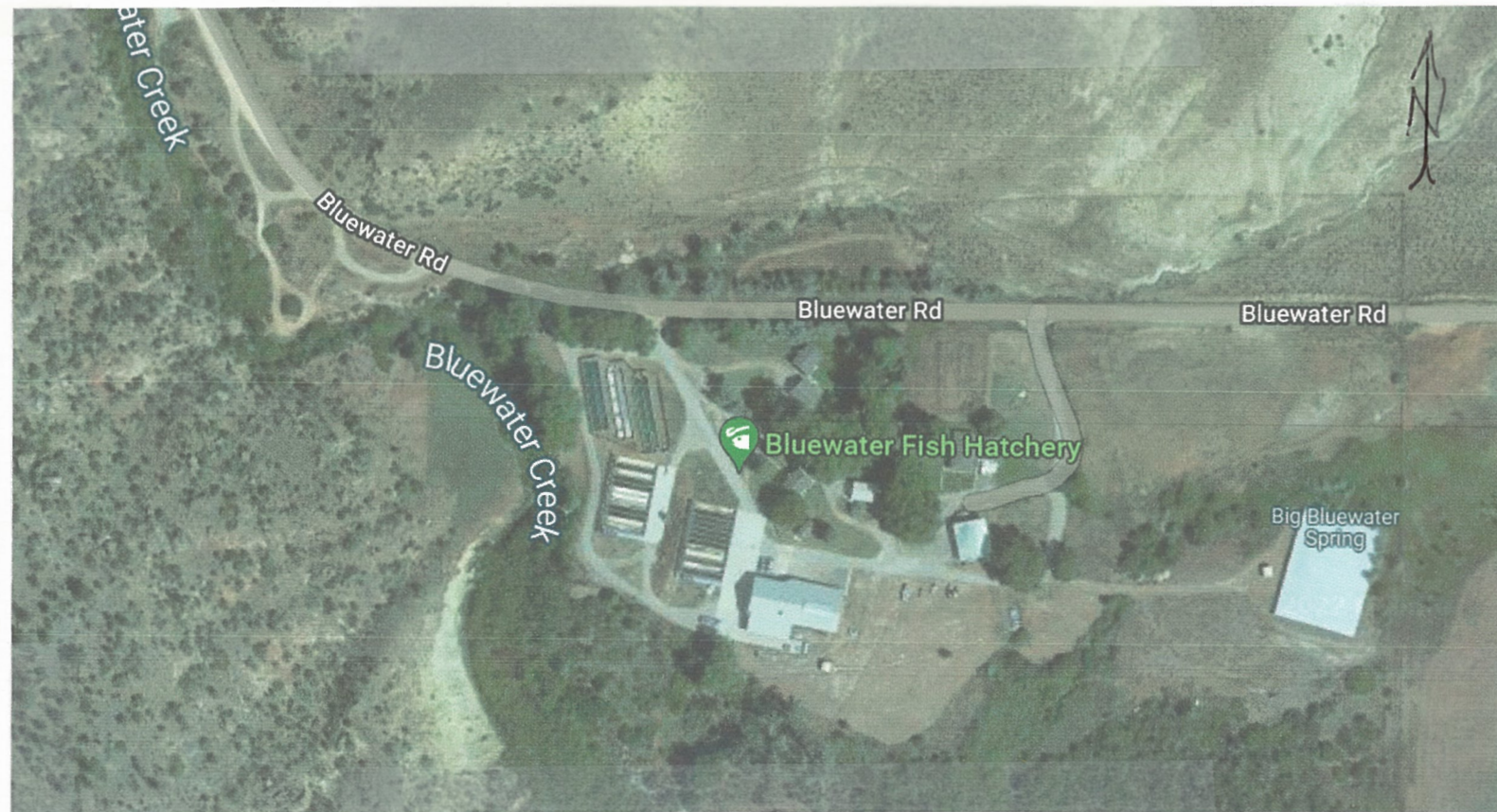


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*Montana Dept of Fish, Wildlife, & Parks  
 Bluewater Fish Hatchery  
 Settling Basin Replacement +  
 July 7, 2022*

*Calvin D. Frank, PE  
 PO Box 118  
 Buffalo, MT 59418  
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REINFORCING STEEL SUMMARY (per double basin)					
Location	Bar Size	Number Of Bars	Length	Type	Comment
Floor	#5	98	22'-0"	Straight	Transverse bars
Floor	#5	2	9-0	Straight	" "
Floor	#5	2	7-0	Straight	" "
Floor	#5	2	5-0	Straight	" "
Floor	#5	8	4-4	Straight	" "
Floor	#5	46	40-0	Straight	Longitudinal bars
Floor	#5	3	21-6	Straight	" "
Floor	#5	4	22-6	Straight	" "
Floor	#5	4	23-6	Straight	" "
Floor	#5	4	24-6	Straight	" "
Floor	#5	8	28-6	Straight	" "
Exterior Walls	#5	71	5-9	Straight	Vertical (6' to 6-3 wall)
Exterior Walls	#5	50	6-1	Straight	Vertical (6-3 to 6-6 wall)
Exterior Walls	#5	50	6-4	Straight	Vertical (6-6 to 6-9 wall)
Exterior Walls	#5	100	6-7	Straight	Vertical (6-9 to 7' Walls)
Exterior Walls	#5	32	40-0	Straight	Horizontal
Exterior Walls	#5	16	21-6	Straight	Horizontal
Exterior Walls	#5	28	4-6	Straight	Horizontal
Exterior Walls	#5	28	3-2	Straight	Horizontal
Exterior Walls	#5	14	3-10	Straight	Horizontal
Exterior Walls	#5	150	4-0	L-bar	2-0 x 2-0 Wall/Floor
Exterior Walls	#5	32	4-0	L-bar	2-0 x 2-0 Corners/Horiz
Exterior Walls	#5	56	4-0	45 deg Bend	2-0 x 2-0 Corners/Horiz
Interior Wall	#4	24	5-9	Straight	Vertical (6' to 6-3 wall)
Interior Wall	#4	25	6-1	Straight	Vertical (6-3 to 6-6 wall)
Interior Wall	#4	25	6-4	Straight	Vertical (6-6 to 6-9 wall)
Interior Wall	#4	25	6-7	Straight	Vertical (6-9 to 7' wall)
Interior Wall	#4	16	40-0	Straight	Horizontal
Interior Wall	#4	8	21-6	Straight	Horizontal
Interior Wall	#4	16	4-0	L-bar	2-0 x 2-0 Corner/Horiz
Interior Wall	#4	50	4-0	L-bar	2-0 x 2-0 Wall/Floor

Note: Lap #4 bars 1'-4" minimum. Lap #5 bars 1'-9" minimum.

Crack Sealing	
Basin #1 & #2	444 ln ft
Basin #3 & #4	460 ln ft
Basin #5 & #6	460 ln ft
<b>Total</b>	<b>1364 ln ft</b>

SURFACING	
3" Base Gravel per double basin	80.7 cu yds
3" Backfill Gravel per double basin	141.8 cu yds
<b>Total Basin Gravel</b>	<b>445.0 cu yds</b>
3/4" Road Mix Gravel	100 cu yds
Magnesium Chloride	610 sq yds

EXCAVATION QUANTITIES	
Per Double Basin	152.3 cu yds
Pipe Excavation	214.4 cu yds
<b>Total</b>	<b>519.0 cu yds</b>

CONCRETE QUANTITIES*	
Slab	71.3 cu yds
Walls	52.0 cu yds
Total per double basin	123.3 cu yds
<b>Total</b>	<b>246.6 cu yds</b>

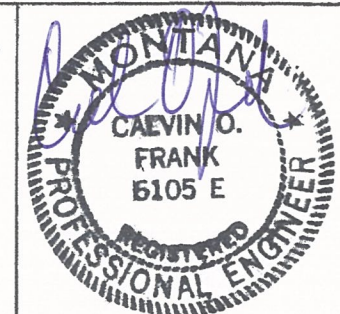
\*Note: 4000 psi compressive strength concrete

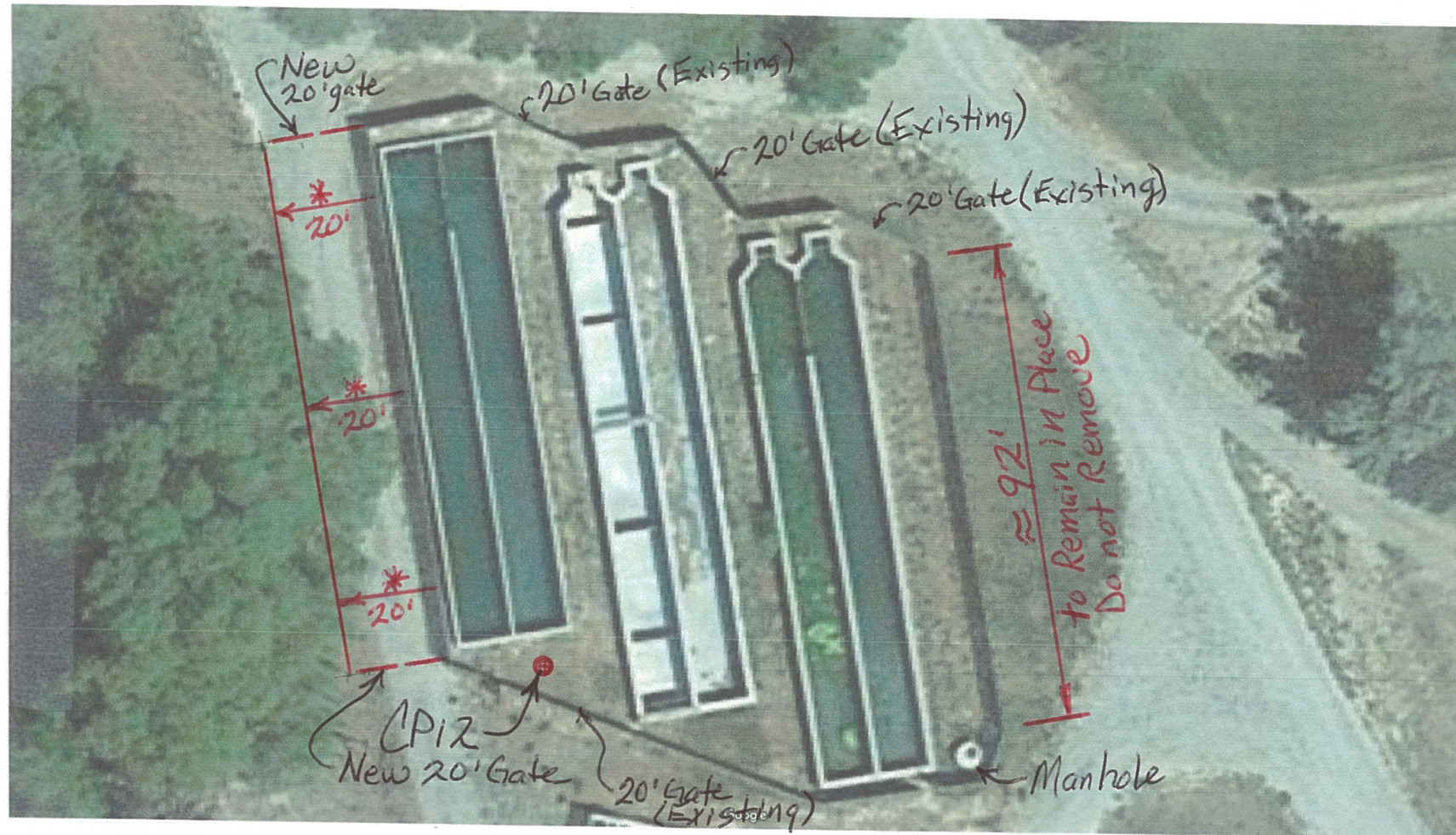
Note: Quantities are estimates.  
Verify prior to ordering materials.

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Settling Basin Replacement

Summary Sheet  
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FENCING	
Remove & Reset*	342 ln ft
New 20' double gate	2 each

\*Note: Includes gates

Note: Remove & Reset Chain Link fence + gates to original place except as noted.

Note: New 20' double gates (2 ~ 10' gates per each) to be placed across existing road.

\* Note: Remove ≈ 102 Lft of existing fence & Reset on opposite side of roadway as shown.

### Fencing Plan

Note: CP12 Elev. = 3960.33

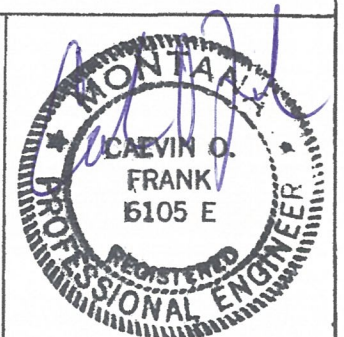
Coordinates: N 395021.9223; E 2,148,330.7553

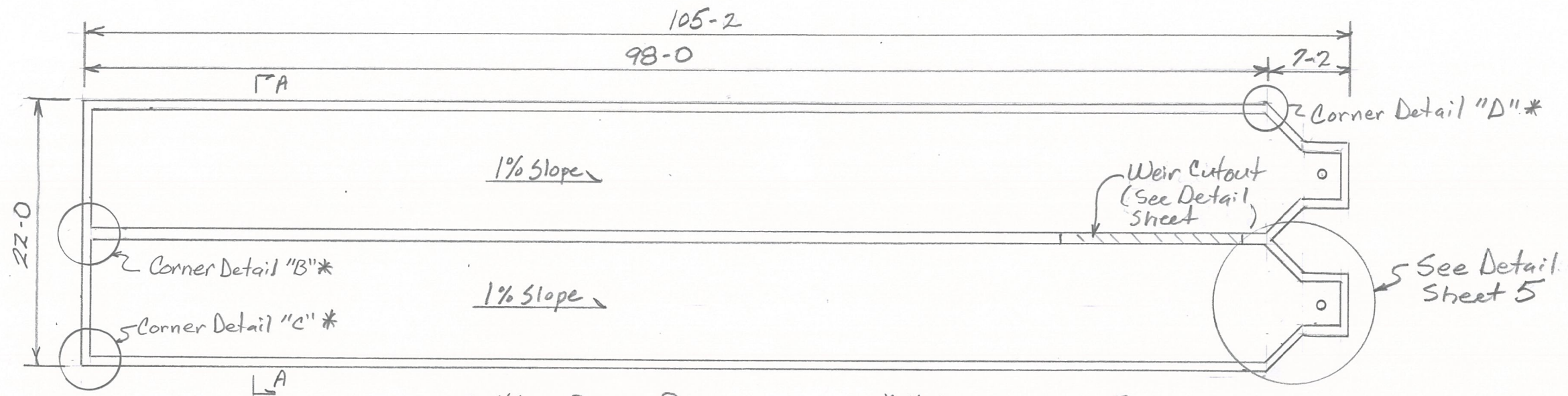
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Fencing Plan

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 No Scale

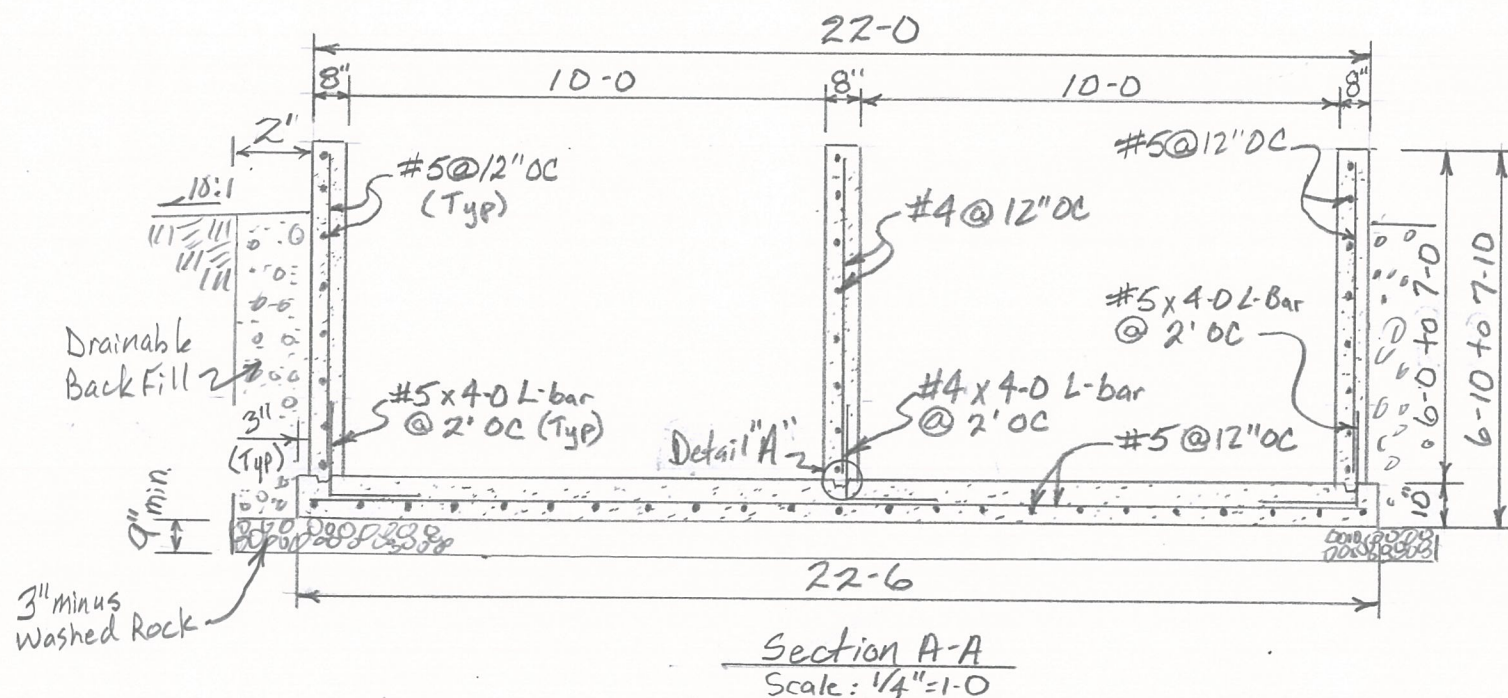
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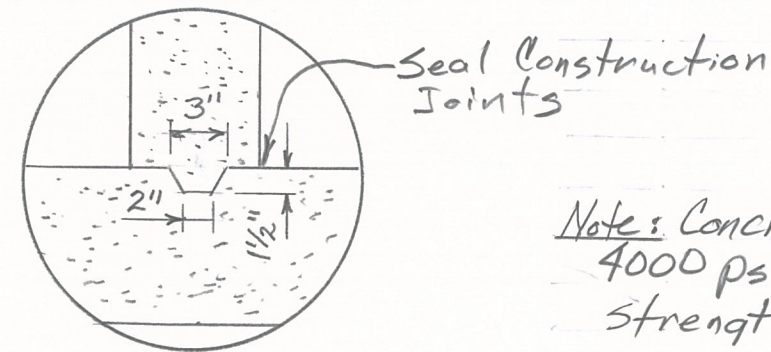


Settling Basin Plan  
Scale: 3/32" = 1'-0"

\* Note: See Page 5  
for Corner Details



Section A-A  
Scale: 1/4" = 1'-0"



Detail "A"

Note: Rebar omitted  
from Detail "A" for  
clarity.

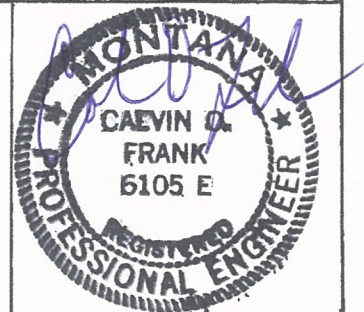
Note: Concrete shall be  
4000 psi min compression  
strength.

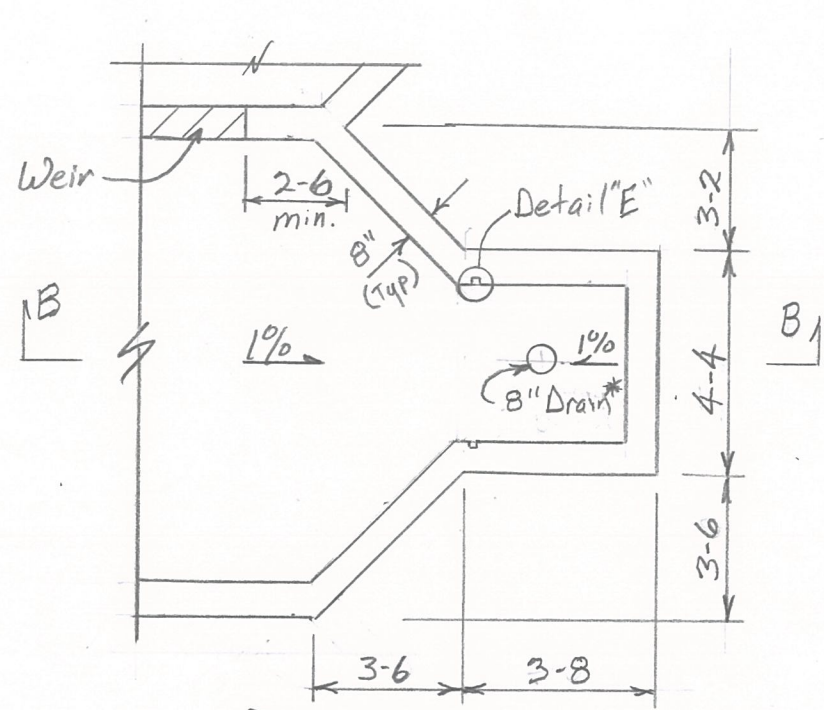
Note: Reinforcing steel  
shall be 60 ksi min  
tensile strength.

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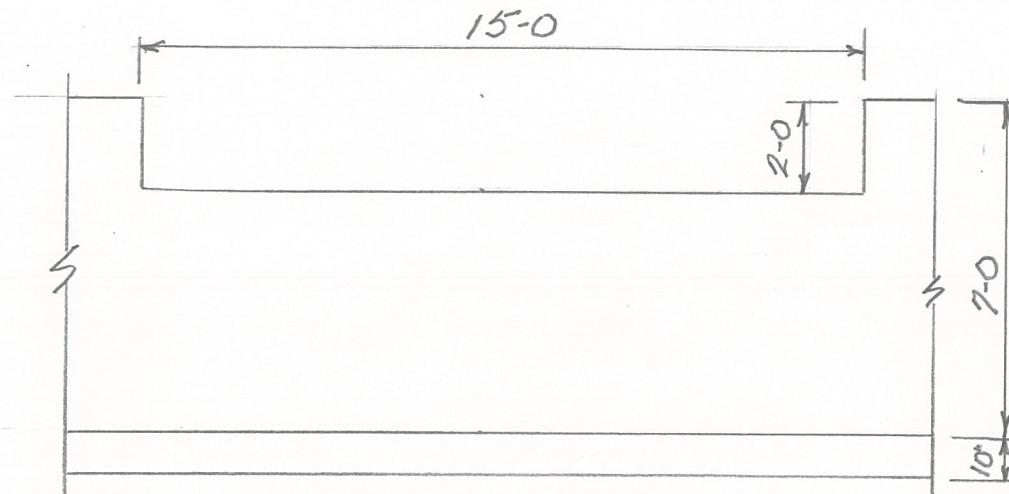
Sediment Basin Plan  
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Scale: As Noted

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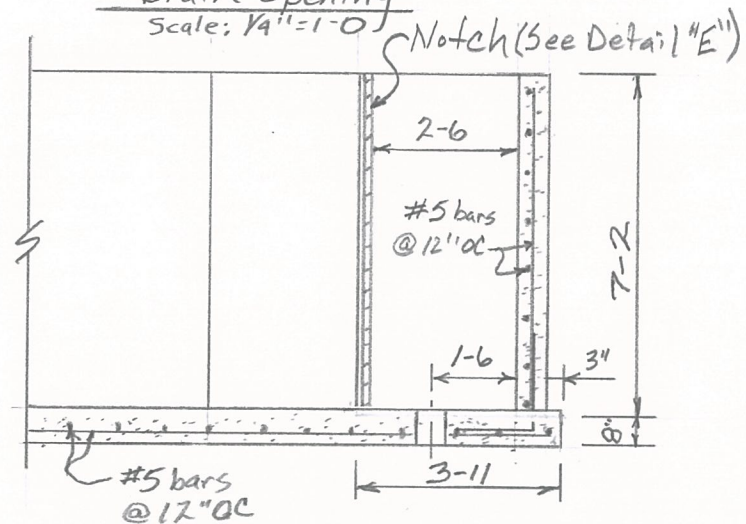


\* Note: Slope 1% into Drain around Drain Pipe.

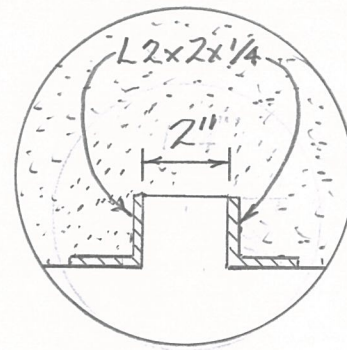


Weir Cut Out  
Scale: 1/4" = 1-0

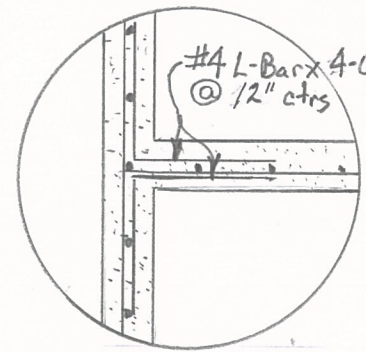
Drain Opening  
Scale: 1/4" = 1-0



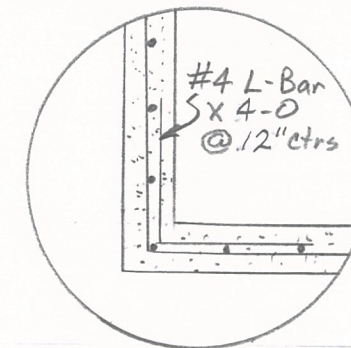
Section B-B  
Scale: 1/4" = 1-0



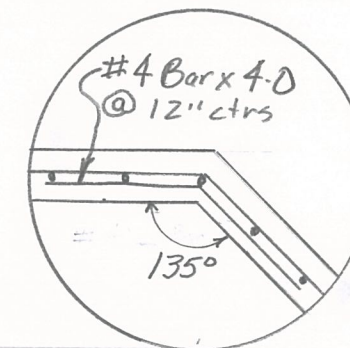
Detail "E"



Corner Detail "B"



Corner Detail "C"



Corner Detail "D"

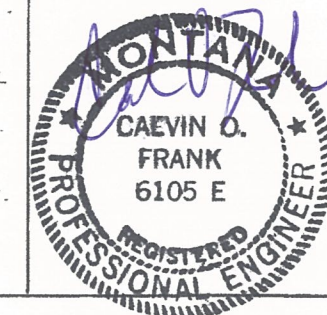
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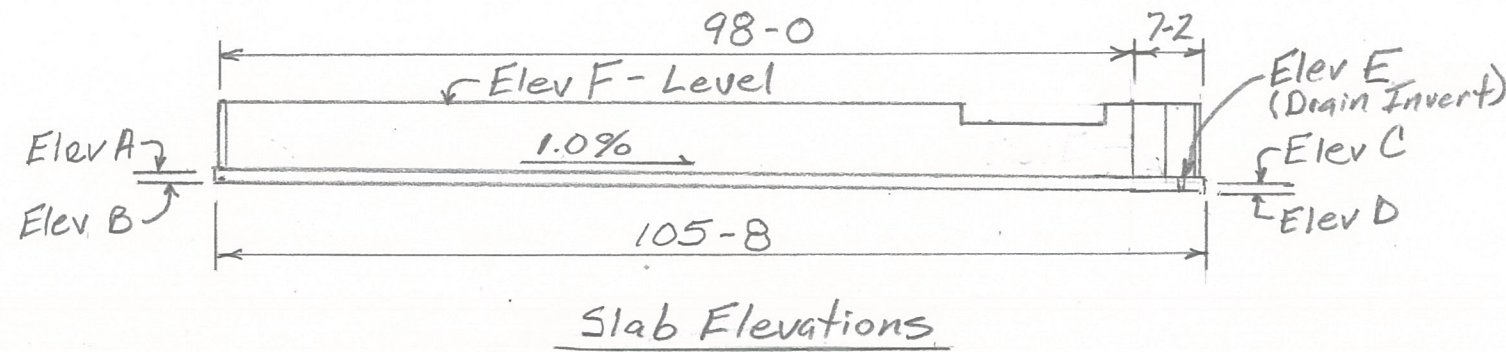
Sediment Basin Details

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Scale: As Noted

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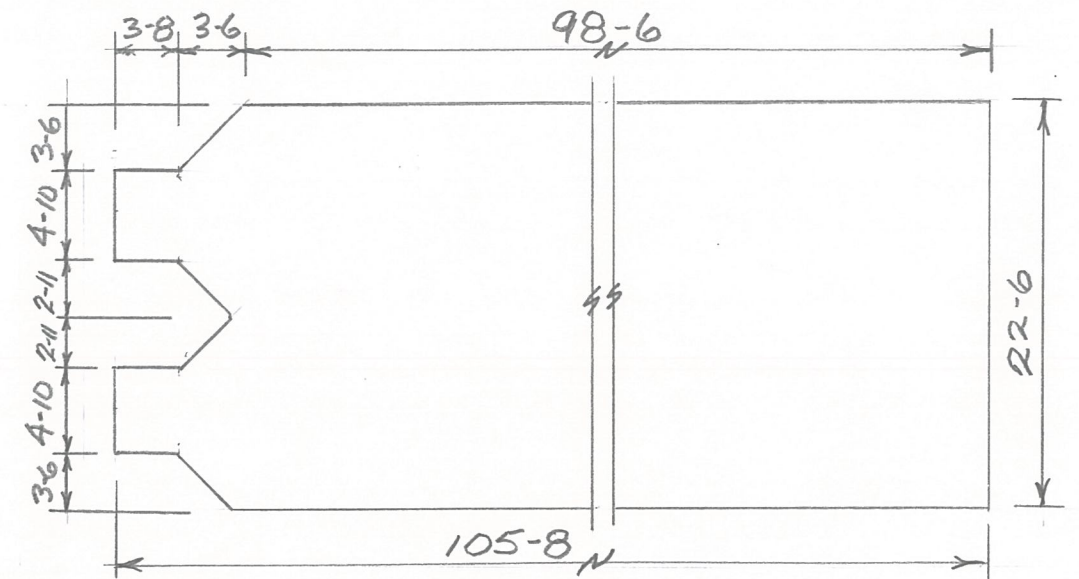




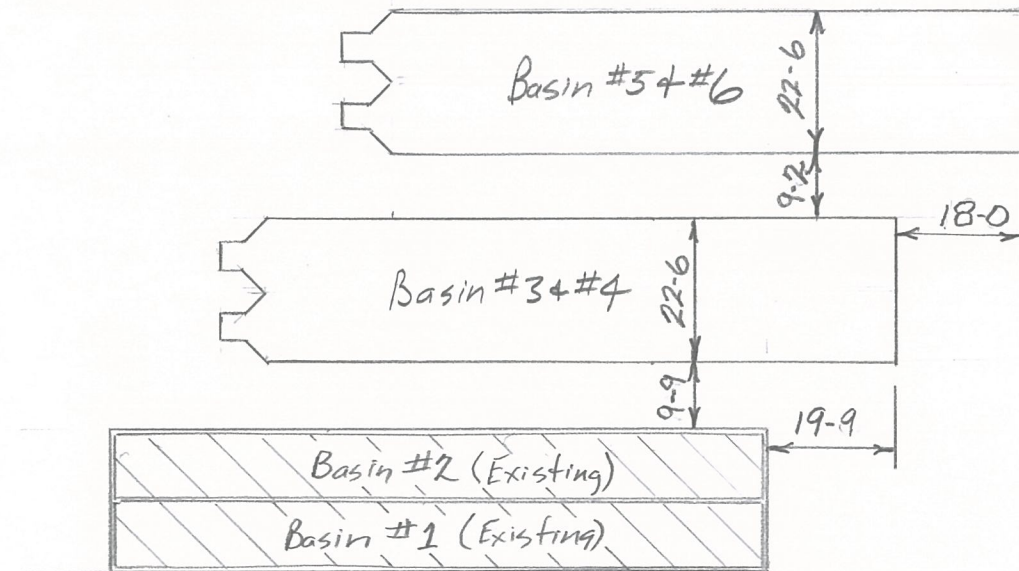
Slab Elevations

Settling Basin Elevations	
Settling Basin #3 & #4	
Elevation A	3958.00
Elevation B	3957.17
Elevation C	3957.00
Elevation D	3956.17
Elevation E	3956.97
Elevation F	3964.00
Settling Basin #5 & #6	
Elevation A	3960.50
Elevation B	3959.67
Elevation C	3959.50
Elevation D	3958.67
Elevation E	3959.47
Elevation F	3966.50

Note: All construction joints & Cracks shall be sealed on the inside of each settling basin (1+2, 3+4, 5+6)



Slab Plan



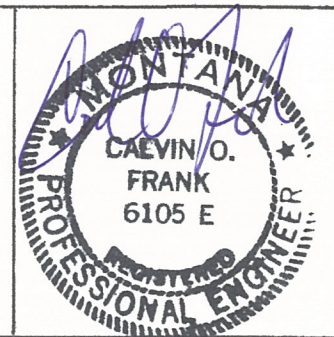
New Slab Layout

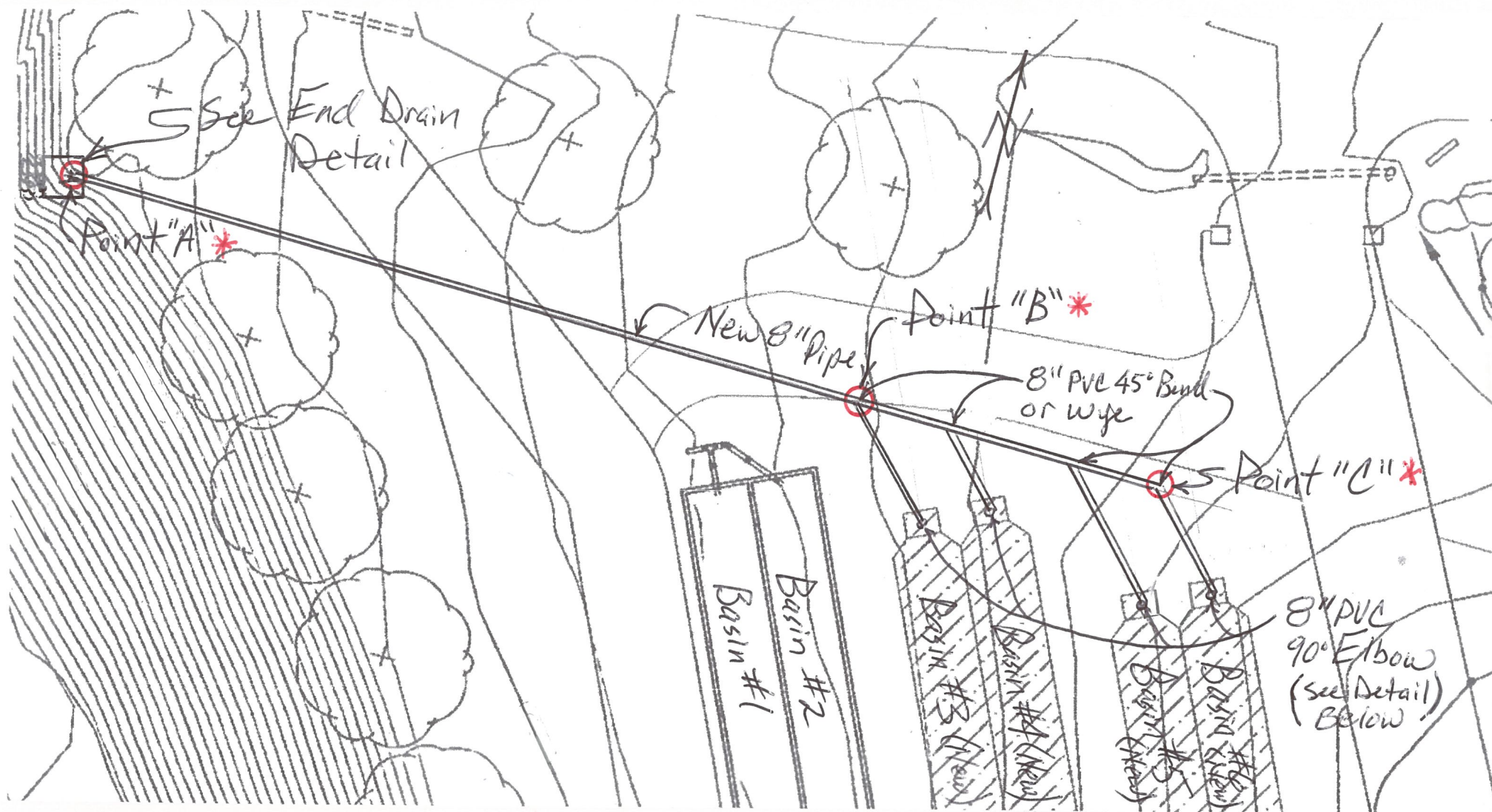
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Sediment Basin Floor Plan

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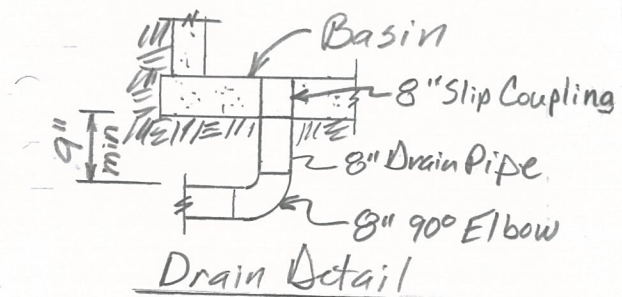
\*Note: Prior to backfill of new 8" Drain pipe, contact DFWP & allow time for Elevation check.

Note: Minimum grade of 1% for new 8" PVC Drain Pipe.

Note: See Piping Schedule Page

Note: All PVC Pipe to be Schedule 40.

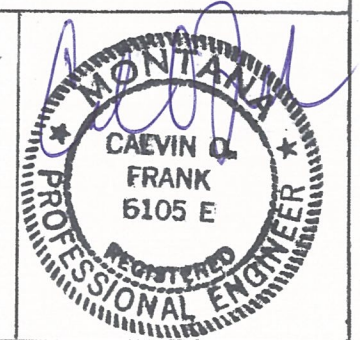
Note: Abandon existing drain pipe.

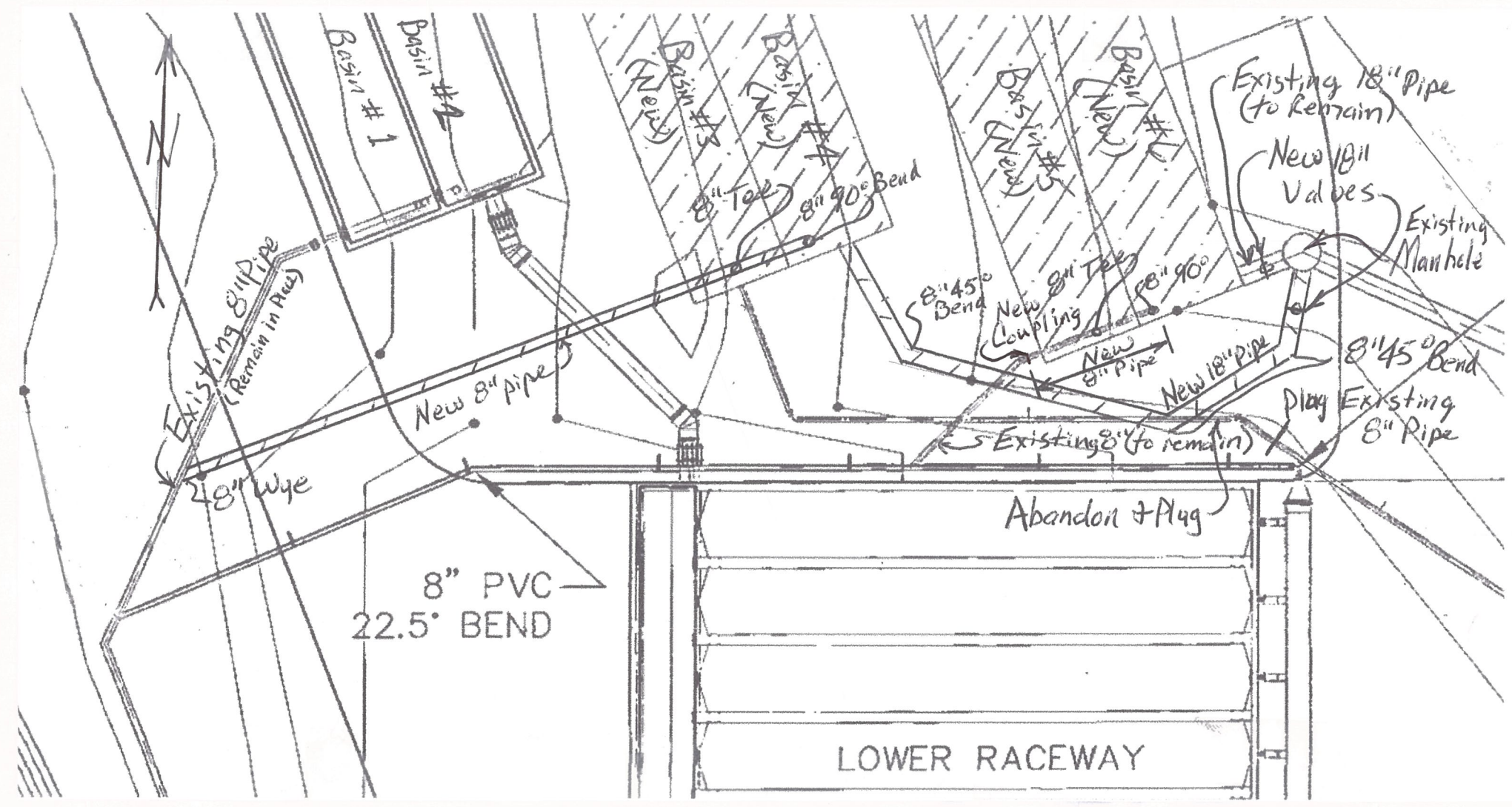


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Drain Plan & Details  
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No Scale

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Note: All PVC pipe to be Schedule 40.

Note: See Piping & Valve Schedules Page 6 of 6.

Note: Minimum 1% grade for flow lines of pipes.

Note: See detail Page 6 of 6 for details for connecting new 18" PVC pipe into manhole (existing) and for insert of new 18" pipe into Basin #4.

Note: Take care to not damage remaining existing pipe.

**VALVE SCHEDULE**

Location	Size	Number of Valves	Body Style	Valve Type	Operator	Installation	Comments
Manhole to Basin #6	18"	1	Lug body	Butterfly	AWWA nut	Buried	Includes valve box
Manhole to Basin #4	18"	1	Lug body	Butterfly	AWWA nut	Buried	Includes valve box

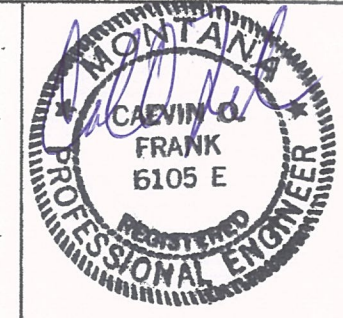
**PIPE SCHEDULE**

Segment Description	Location	Length/Size	Material	Joint Type	Installation	Comments
Basin #3, #4, #5, & #6	North End	210 ln ft/8"	Sch 40 PVC	Cemented	Buried	Includes 2 - 90 Elbows and 4 - 45 Wyes
Basin #3 & #4	South End	78 ln ft/8"	Sch 40 PVC	Cemented	Buried/Inside Basins	Includes 1 - 90 Elbow and 2 - Tees with Stand Pipe
Basin #5 & #6	South End	28 ln ft/8"	Sch 40 PVC	Cemented	Buried/Inside Basins	Includes 1 - 90 Elbow and 2 - Tees with Stand Pipe
Manhole to Basin #4	South End	70 ln ft/18"	Sch 40 PVC	Bell Gasket	Buried	Includes 3 - 45 Elbows

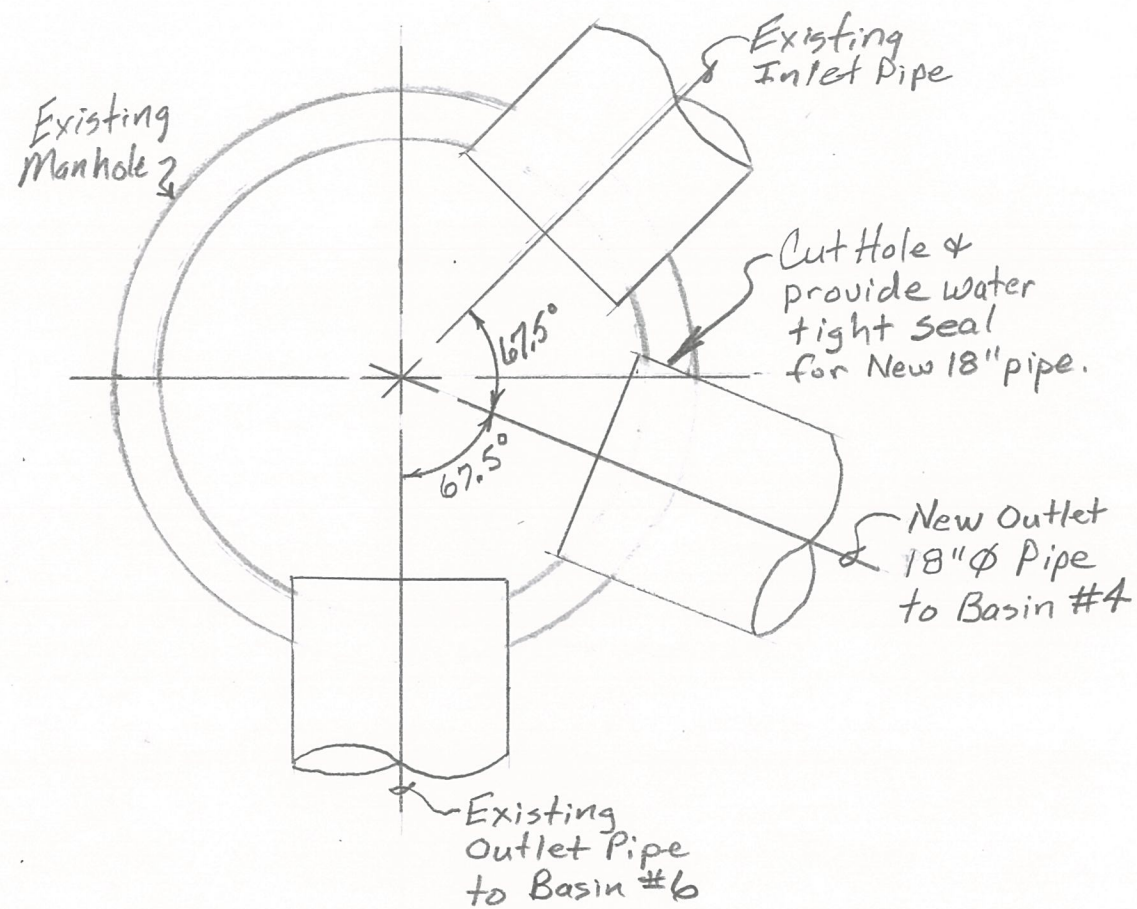
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Drain & Inlet Details  
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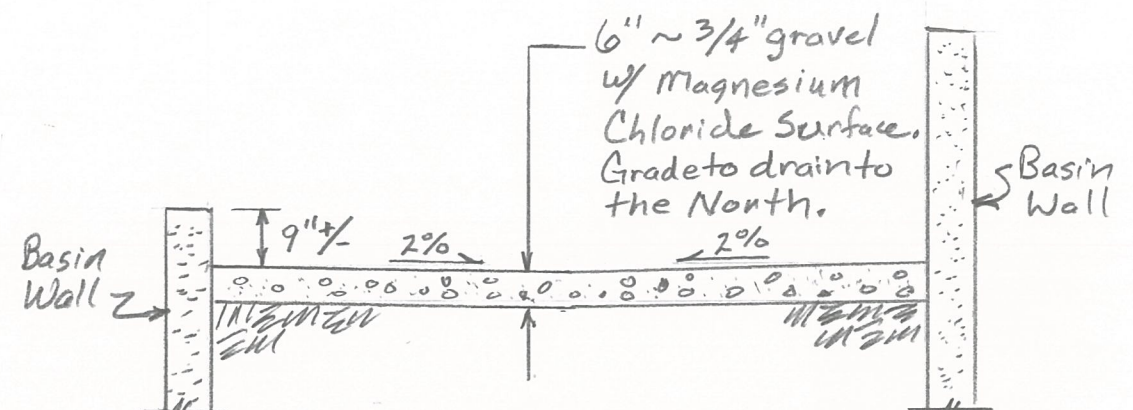
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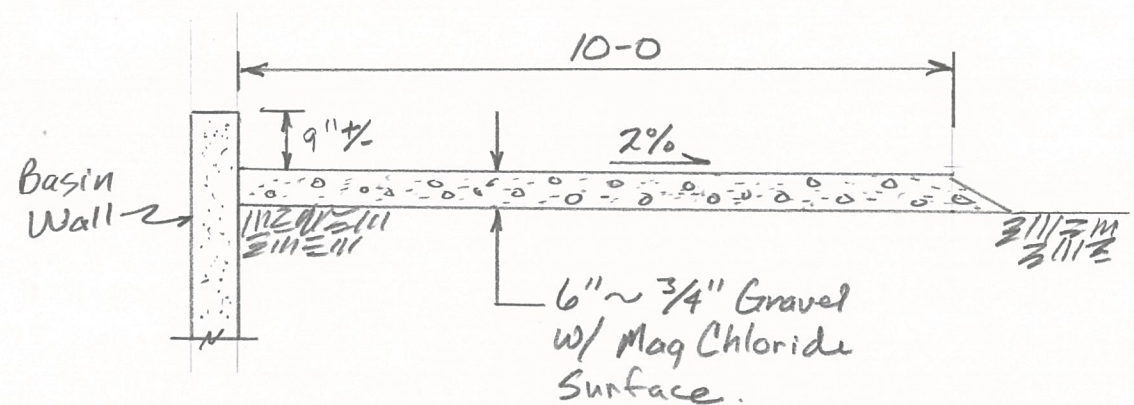




Manhole Detail for New 18" Ø Pipe  
Scale: 3/4" = 1-0



Typical Section between Basins



Typical Section @ Outside Basins  
Scale: 3/8" = 1-0

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Manhole Detail & Rdwy Typical Sections  
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