No. PW090903-12

FMG. INC. 3700 Sturgis Road, Rapid City, South Dakota 57702-0317 605/342-4105
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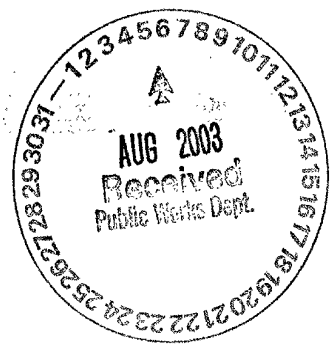
August 5, 2003



Ted Vore
Public Works Director
City of Rapid City
300 6th Street
Rapid City, SD

RE: TRUCK ROUTE DBDP

Dear Ted:

Per your request we have looked at another option on the Truck Route DBDP. This option is a modification of the draft DBDP submitted on July 3, 2003. The option follows the routes shown on Figure 3 in the July 3, 2003 submittal with the exception that Element 13 is proposed as a storm sewer pipe to connect the Element 305 Pond to the upstream end of the Element 9 channel. A schematic of the routing for this option is attached to this letter as Figure AG1.

It was also assumed the Pond 305 would be per the draft Design Plan Optional Routing. Under that option the discharge from Pond 305 is 89 cfs.

A Table of Flows is attached showing the results of this option as well as the flows that were included in the July 3, 2003 submittal.

Based on a normal depth analysis the proposed pipe would be a 48" RCP. Capacity is about 100 cfs assuming an n value of 0.012. The pipe slope would be at 0.004 ft/ft. Pipe depth (to flow line from proposed road centerline) would range from about 10' to 16' deep.

Note that it will be necessary to drop the proposed 15" sewer elevation about 1 foot from that shown on the preliminary 5th Street plans prepared by Ferber Engineering. This will allow the 48" RCP to cross over the sanitary sewer with clearance of about 1 foot.

About 1000 feet of 48" pipe would be required. Based on the City of Rapid City estimating guide the cost of this pipe is about $110.00 foot. Total estimated cost of the pipeline would likely be on the order of $200,000.00 when adding items for the connection to the upstream cow pass, outlet end section, cradles at the sewer crossing, bends, outlet erosion protection, deep installation, lowering of the proposed 16" water main at storm sewer crossings, etc.

An option that could be considered is having Pond 305 per the draft DBDP with 216 cfs out. This would require an increase in the pipe size to 66" RCP. This pipe would cost significantly more than the 48" RCP.

I think this is the information you requested. Please contact me if you have any questions.

Sincerely,
FMG, Inc.

Jerry D. Foster P.E.

CC Marcia Elkins – City of Rapid City
Rich Wells – City of Rapid City
File 8467

HYDRAULIC ELEMENT PEAK FLOWS (CFS)

ELEMENT NUMBER	EXISTING 100 YEAR (CFS)	DESIGN PLAN 100 YEAR (CFS)	DESIGN PLAN OPTIONAL ROUTNG 100 YEAR (CFS)	*DESIGN PLAN WITH OPTION OF ELEMENT 13 ALONG 5TH ST (CFS)*
1*	936	1,072	1,026	*1,027*
2*	938	1,073	1,036	*1,037*
3*	145	43	43	*43*
4*	1,008	957	897	*918*
5*	42	57	57	*57*
6*	1001	936	891	*909*
7*	612	564	891	*565*
8*	494	324	121	*209*
9*	249	121	121	*210*
10*	498	677	8	*677*
11*	23	8	8	*8*
12*	683	672	747	*672*
13*	165	207	88	*89*
14*	27	13	13	*13*
15*	30	13	13	*13*
16*	745	624	624	*624*
17*	577	391	391	*391*
18*	368	250	250	*250*
19*	215	228	228	*228*
20*	189	175	175	*175*
30*	191	NA	NA	*NA*
31*	492	672	NA	*672*
100	936	1,077	1,057	*1,058*
101	1,151	1,118	1,117	*1,117*
102	651	629	893	*631*
103	898	882	957	*882*
104	178	500	500	*500*
105	860	833	833	*833*
106	216	545	545	*545*
130	683	672	NA	*672*
200	938	1,073	1,038	*1,039*
201	42	57	57	*57*
202	23	8	8	*8*
203	683	672	744	*672*
204	31	13	13	*13*
205	190	177	177	*177*
300	NA	252	252	*252*
301	NA	121	121	*121*
302	NA	229	229	*229*
304	NA	43	43	*43*
305	NA	216	89	*89*
306	NA	635	635	*635*

EXISTING – This data is for existing land use and existing hydraulic conditions
DESIGN PLAN – This data is per the Design Plan recommendations per Draft July 3, 2003 submittal.
DESIGN PLAN OPTIONAL ROUTING – This data is for the optional routing in shown on Fig AF1 in Draft July 3, 2003 submittal.
DESIGN PLAN WITH OPTION OF ELEMENT 13 ALONG 5TH ST – Same of Design Plan except Element 13 along 5th Street to Element 9 and Pond 305 per July 3, 2003 Optional Routing
See Fig. AG1

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DESIGN PLAN RECOMMENDED IMPROVEMENTS

ELEMENT	IMPROVEMENT
1	CONSTRUCT NEW CHANNEL
2	EXTEND AND IMPROVE BOX CULVERT
3	CONSTRUCT NEW CHANNEL
4	CONSTRUCT NEW CHANNEL WITH DROP STRUCTURES
5	CONSTRUCT NEW CHANNEL WITH PARTIAL GEOTEXTILE LINING
6	CONSTRUCT NEW CHANNEL WITH DROP STRUCTURES
7	CONSTRUCT NEW CHANNEL WITH DROP STRUCTURES AND CONSTRUCT BOX CULVERT AT ELM AVENUE CROSSING
8	CONSTRUCT NEW CHANNEL WITH DROP STRUCTURES
9	CONSTRUCT NEW CHANNEL WITH DROP STRUCTURES
10	CONSTRUCT NEW CHANNEL WITH DROP STRUCTURES AND CONSTRUCT CROSSING AT ELM AVENUE
11	NO IMPROVEMENTS
12	CONSTRUCT NEW CHANNEL WITH DROP STRUCTURES
13	NEW STORM SEWER SYSTEM
14	REPLACE CHANNEL WITH STORM SEWER
15	REGRADE CHANNEL AND LINE WITH GEOTEXTILE
16	CONSTRUCT NEW CHANNEL WITH DROP STRUCTURES
17	CONSTRUCT NEW CHANNEL WITH DROP STRUCTURES
18	CONSTRUCT NEW CHANNEL WITH DROP STRUCTURES
19	CONSTRUCT NEW CHANNEL
20	REGRADE AND ARMOR UPPER SEGMENT OF CHANNEL
200	MODIFY EXISTING METERING POND
201	MODIFY EXISTING METERING POND
202	MODIFY EXISTING METERING POND
203	MODIFY EXISTING METERING POND
204	MODIFY EXISTING METERING POND
205	MODIFY EXISTING METERING POND
300	NEW METERING POND
301	NEW METERING POND
302	NEW METERING POND
304	NEW METERING POND
305	NEW METERING POND
306	NEW METERING POND

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SOUTH TRUCK ROUTE
DRAINAGE BASIN DESIGN PLAN
RAPID CITY, SOUTH DAKOTA

JULY, 2003

Revision / Date

Sheet Name:
DESIGN PLAN SCHEMATIC WITH OPTION OF ELE. 15 ALONG 5TH STREET

Figure Number:
AG1