

CITY OF RAPID CITY

Engineering Division

300 Sixth Street
Telephone: (605) 394-4154
FAX: (605) 394-6636

MEMORANDUM

TO: Mayor, Council Members, and Planning Commission Members
FROM: Engineering Division
DATE: November 10, 2003
RE: Adoption of the South Truck Route Drainage Basin Design Plan

The South Truck Route Drainage Basin is located in south Rapid City. The basin encompasses about 1878 acres. The basin is bounded approximately on the east by Highway 79, on the north by the South Robbinsdale Drainage Basin, on the west by the Arrowhead Drainage Basin and on the south by the Landfill Drainage Basin. The drainage basin boundaries are outlined on a topographic map included as Figure 1.

The basin is divided into fourteen sub-basins also shown on Figure 1

Future land plan used for the study was provided by the Rapid City Planning Department.

The plan as shown on the Hydrologic Schematic includes storm sewer pipe, detention facilities and open channels. The estimated cost for all recommended improvements is \$3.915 million. Improvements will be completed as development occurs or as a specific project is paid for with City funds. After the Rapid City Council has approved the plan, the City will begin charging interim drainage basin fees of \$2085.00 per acre.

Staff has reviewed this plan and recommends approval.



EQUAL OPPORTUNITY EMPLOYER

BASINS PREVIOUSLY APPROVED

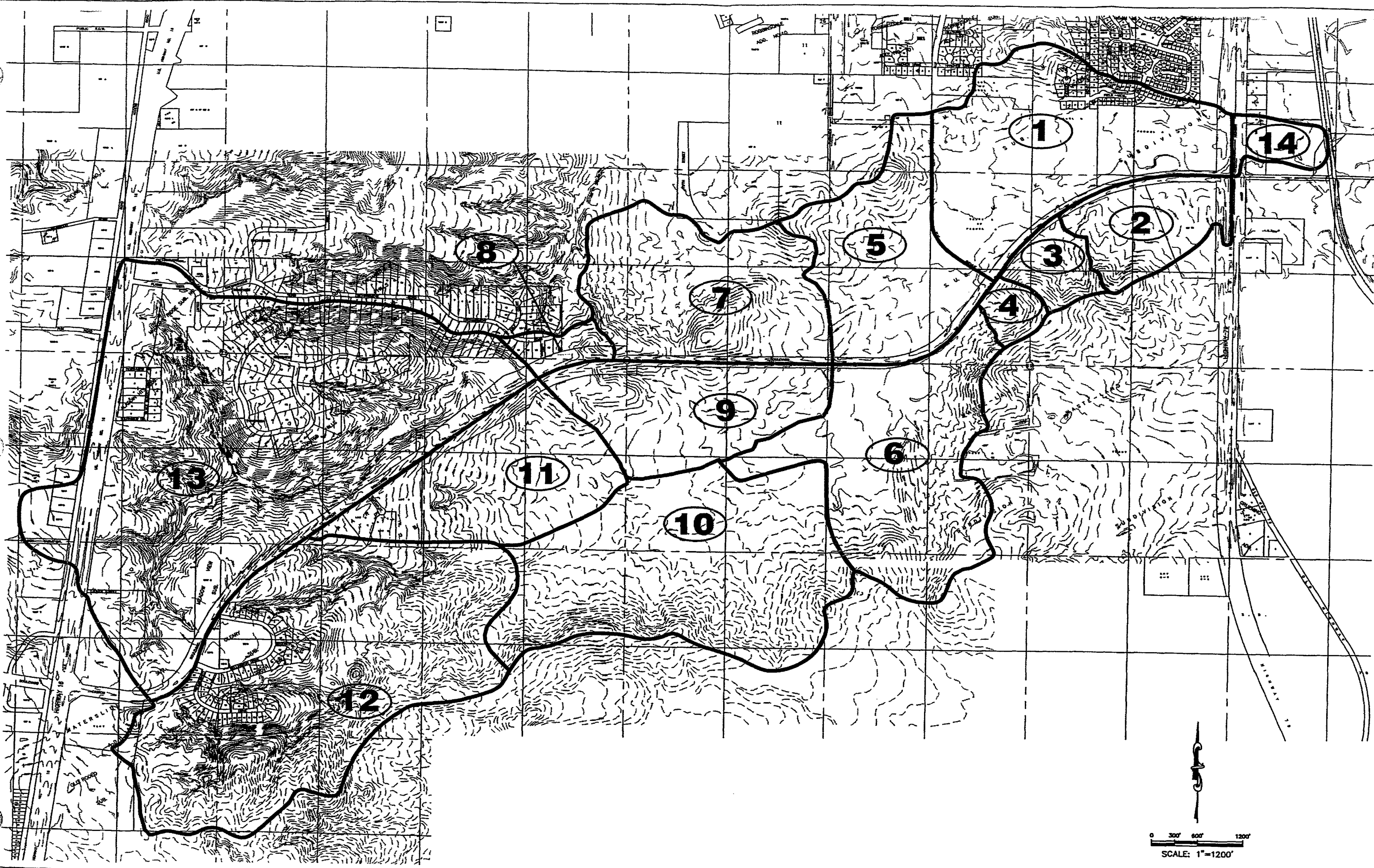
<u>Basin Name</u>	<u>Size</u>	<u>Cost Estimate</u>	<u>Basin Fee</u>
Arrowhead Basin	4250 Acres	\$ 2,500,000	\$ 588/acre
Deadwood Avenue Basin	1870 Acres	\$ 675,000	\$ 360/acre
Downtown Basin	1300 Acres	\$ 4,600,000	\$ 3,540/acre
Haines Avenue Basin	1180 Acres	\$ 4,900,000	\$ 4,150/acre
Knollwood Basin	1152 Acres	\$ 6,679,000	\$ 5,750/acre
Meade-Hawthorne Basin	2637 Acres	\$ 8,753,000	\$ 3,320/acre
Morningside Basin	1078 Acres	\$ 2,013,506	\$ 1,870/acre
Red Rock Canyon Basin	3200 Acres	\$ 1,082,370	\$ 338/acre
Red Dale Basin	800 Acres	\$ 1,400,000	\$ 1,750/acre
South Canyon/Lime Creek	6140 Acres	\$ 2,006,000	\$ 325/acre
South Robbinsdale Basin	1635 Acres	\$ 2,365,000	\$ 1,450/acre
Perrine	1220 Acres	\$ 2,443,000	\$ 2,005/acre
Wonderland Dr	585 Acres	\$ 1,859,000	\$ 3,178/acre

Basin to be Approved By the Rapid City Council:

<i>South Truck Route</i>	<i>1878 Acres</i>	<i>\$ 3,915,000</i>	<i>\$ 2,085/acre</i>
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TABLE 1 - SUMMARY OF DESIGN PLAN
RECOMMENDED IMPROVEMENTS AND ESTIMATED COSTS

NUMBER	RECOMMENDED IMPROVEMENT	ESTIMATED COST
1	Construct new channel.	\$50,000.00
2	Extend both ends of box culvert, side taper inlet.	\$160,000.00
3	Construct new channel.	\$10,000.00
4	Construct new channel with drop structures	\$225,000.00
5	Construct new channel with partial geotextile lining.	\$15,000.00
6	Construct new channel with drop structures	\$75,000.00
7	Construct new channel with drop structures & construct box culvert at Elm Avenue crossing.	\$155,000.00
8	Construct new channel with drop structures.	\$140,000.00
9	Construct new channel with drop structures.	\$75,000.00
10	Construct new channel with drop structures & construct Elm Avenue/Rearage Road crossing	\$265,000.00
11	No improvements	NA
12	Construct new channel with drop structures.	\$60,000.00
13	Construct new channel with drop structures & construct Rearage Road Crossing	\$150,000.00
14	Replace channel with storm sewer.	\$220,000.00
15	Regrade channel and line with geotextile..	\$40,000.00
16	Construct new channel with drop structures.	\$110,000.00
17	Construct new channel with drop structures.	\$175,000.00
18	Construct new channel with drop structures.	\$225,000.00
19	Construct new channel.	\$15,000.00
20	Line upper segment of channel with gabions.	\$160,000.00
31	Construct new channel with drop structures	\$45,000.00
200	Modify existing metering pond. (Costs Under Element 2)	NA
201	Modify existing metering pond.	\$2,000.00
202	Modify existing metering pond.	\$3,000.00
203	Modify existing metering pond.	\$140,000.00
204	Modify existing metering pond.	\$5,000.00
205	Modify existing metering pond..	\$15,000.00
300	New metering pond.	\$65,000.00
301	New metering pond.	\$110,000.00
302	New metering pond.	\$75,000.00
304	Install riser to create new metering pond.	\$5,000.00
305	New metering pond	\$75,000.00
306	New metering pond	\$150,000.00
<u>IMPROVEMENTS SUBTOTAL TOTAL</u>		<u>\$3,015,000.00</u>
5% CONTINGENCY		\$150,000.00
25% ENGINEERING/ADMINISTRATION		\$750,000.00
TOTAL COST OF DESIGN PLAN IMPROVEMENTS		\$3,915,000.00



File Number: 8457\8457SCM.DWG
 Location: BLACK HILLS MOUNTAIN
 Approved By: _____
 Date: _____
 Designed By: JCF
 Drawn By: MCS
 Checked By: JCF

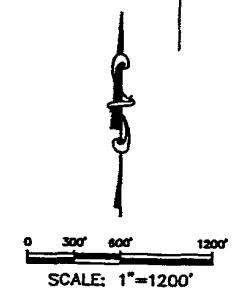
**SOUTH TRUCK ROUTE
 DRAINAGE BASIN DESIGN PLAN
 RAPID CITY, SOUTH DAKOTA**

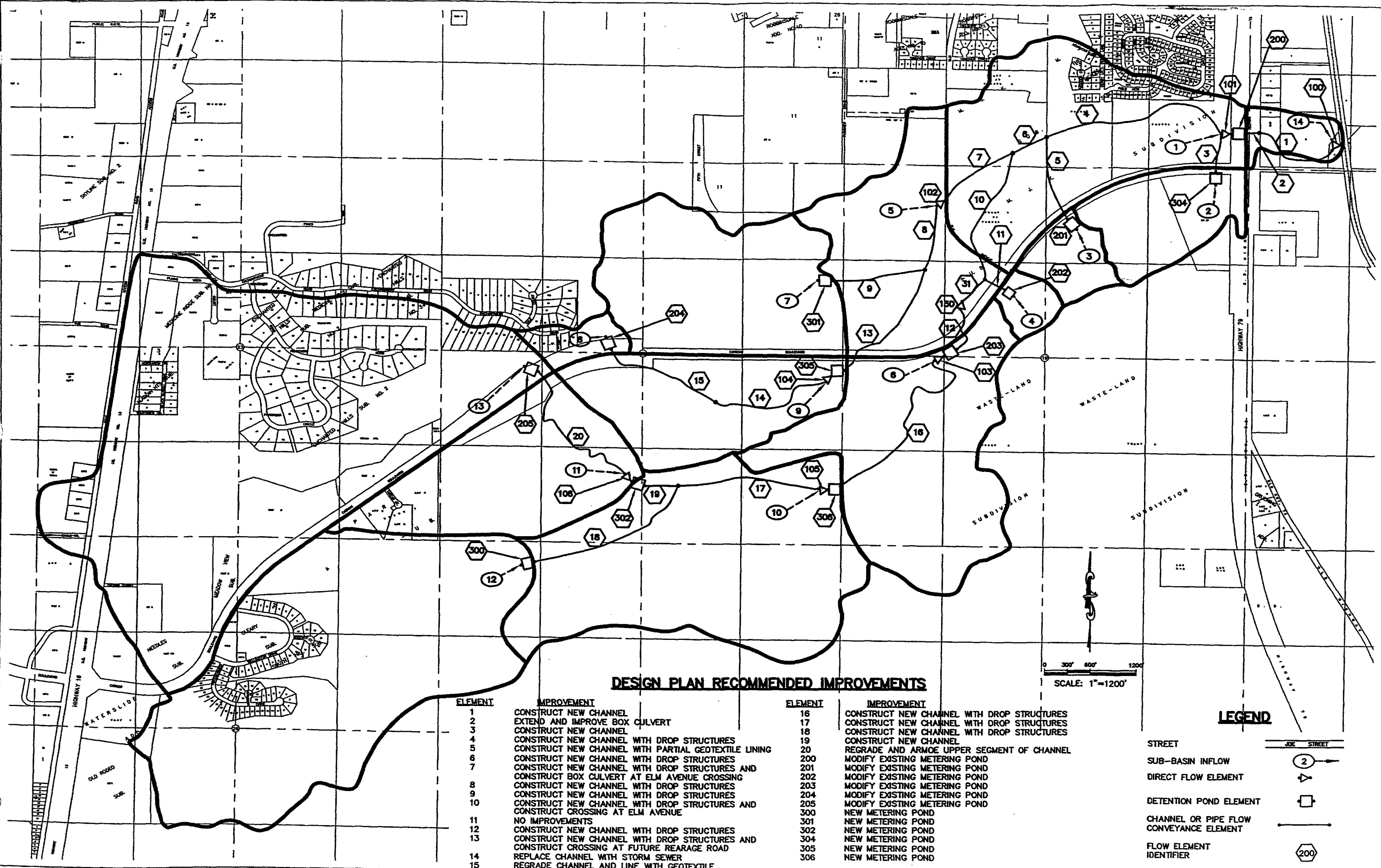
OCTOBER, 2003

Revision / Date

Sheet Name:
SUB-BASINS

Figure Number:
1





DESIGN PLAN RECOMMENDED IMPROVEMENTS

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

SCALE: 1"=1200'

LEGEND

- STREET
- SUB-BASIN INFLOW
- DIRECT FLOW ELEMENT
- DETENTION POND ELEMENT
- CHANNEL OR PIPE FLOW CONVEYANCE ELEMENT
- FLOW ELEMENT IDENTIFIER

F M G, Inc.
 3700 Sturgis Road
 Rapid City, SD 57702-0317
 (605) 342-4105 FAX (605) 342-4222



File Number: 84578457SCHLDRG
 Location: BLACK HILLS MERIDIAN
 Surveyed By: _____
 Date: _____
 Designed By: JCF
 Drawn By: MSS
 Checked By: JCF

SOUTH TRUCK ROUTE
 DRAINAGE BASIN DESIGN PLAN
 RAPID CITY, SOUTH DAKOTA
 OCTOBER, 2003

Revision / Date

Sheet Name:
**DESIGN PLAN
 HYDROLOGIC
 SCHEMATIC**

Figure Number:

File Number:
 8487\8487SCH.DWG
 Location:
 BLACK HILLS MERRIMAN
 Surveyed By:
 Date:
 Designed By: JCF
 Drawn By: MOS
 Checked By: JCF

OCTOBER, 2003

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

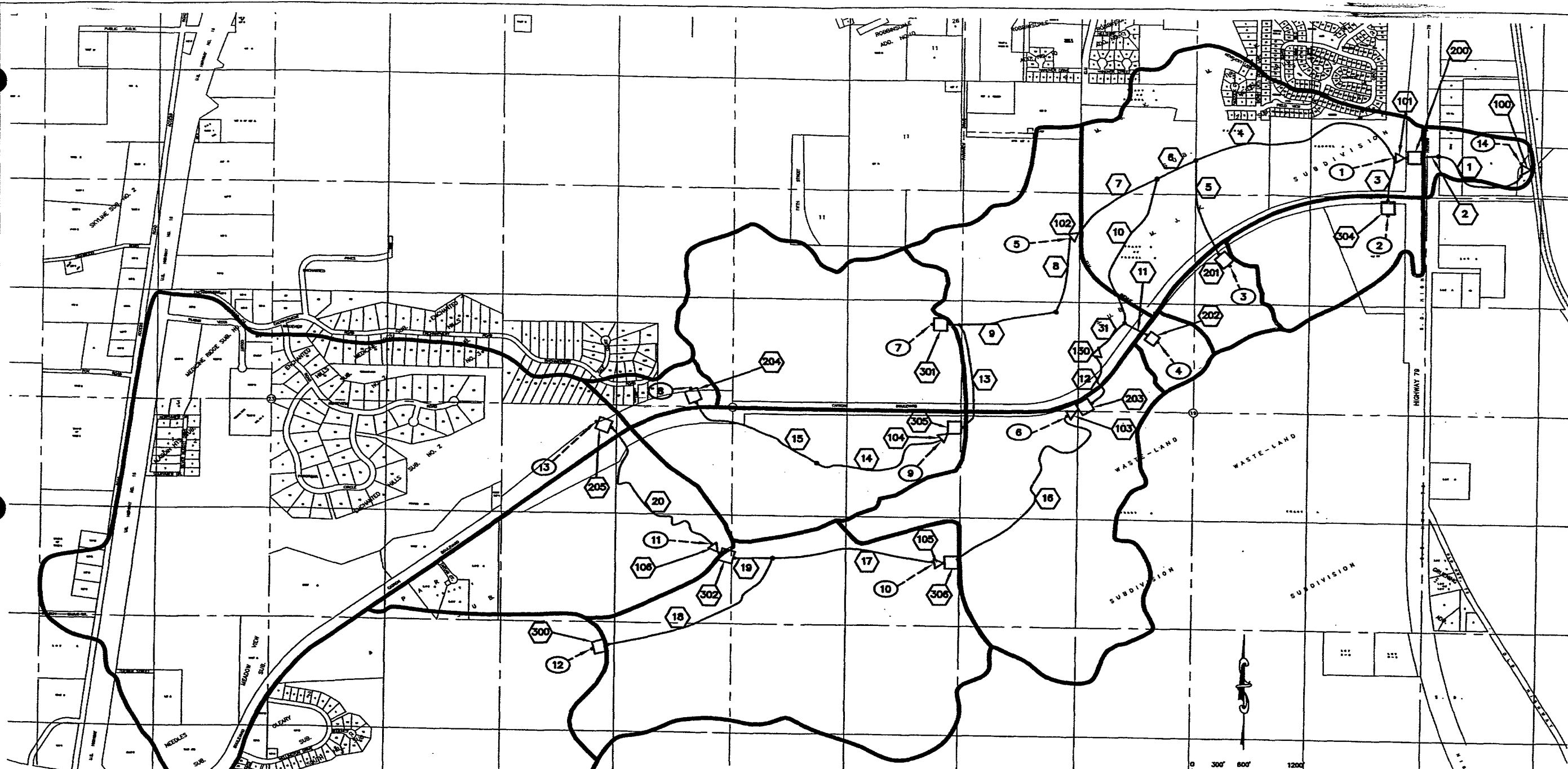
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Sheet Name:

**DESIGN PLAN
 WITH
 OPTIONAL
 ROUTING
 SCHEMATIC**

Figure Number:

F1



DESIGN PLAN WITH OPTIONAL ROUTING RECOMMENDED IMPROVEMENTS

SCALE: 1"=1200'

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

LEGEND

- STREET
- SUB-BASIN INFLOW
- DIRECT FLOW ELEMENT
- DETENTION POND ELEMENT
- CHANNEL OR PIPE FLOW CONVEYANCE ELEMENT
- FLOW ELEMENT IDENTIFIER