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Phoenix, AZ 85009

RECORD OF CORRESPONDENCE
&
MEETING MINUTES
FOR
GROVERS AVENUE
STORM DRAIN LATERAL
FCD No.: 93-21

SUBMITTED TO:

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
2801 WEST DURANGO STREET
PHOENIX, AZ 85009



SUBMITTED BY:

**Morrison
Maierle / CSSA**
INC.

MM/CSSA Project No.: 8156.001



FLOOD CONTROL DISTRICT
OF MARICOPA COUNTY

2801 West Durango Street
Phoenix, Arizona 85009

(602) 506-1501

LETTER OF TRANSMITTAL

AEF(GR) 3.1

RECEIVED FEB 10 1995

DATE 2/9/95	JOB NO.
ATTENTION Bruce Friedhoff	
RE Groves Ave Lateral 90% Review Comments	

TO Morrison Maierle / CSSA
4621 N 16th St, Ste D401
Phoenix, AZ

WE ARE SENDING YOU Attached Under separate cover via _____ the following items:

- Shop drawings Prints Plans Samples Specifications
 Copy of letter Change order _____

COPIES	DATE	NO.	DESCRIPTION
1	2/9/95		Cover Letter
1			1/2 size COP review comments set
1			1/2 size FCD review comments set
1			full size FCD review comments set

THESE ARE TRANSMITTED as checked below:

- For approval Approved as submitted Resubmit _____ copies for approval
 For your use Approved as noted Submit _____ copies for distribution
 As requested Returned for corrections Return _____ corrected prints
 For review and comment _____
 FOR BIDS DUE _____ 19 _____ PRINTS RETURNED AFTER LOAN TO US

REMARKS: Please return all review sets with your next submittal.

COPY TO _____

SIGNED: *Michael A. [Signature]*

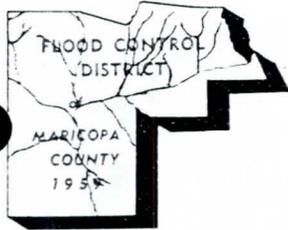
FLOOD CONTROL DISTRICT

of

Maricopa County

2801 West Durango Street • Phoenix, Arizona 85009
Telephone (602) 506-1501
Fax (602) 506-4601
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FEB 09 1995

RECEIVED FEB 10 1995

Bruce Friedhoff, P.E.
Office Manager
Morrison Maierle/CSSA
4621 North 16th Street, Suite D-401
Phoenix, Arizona 85016

Reference: Contract FCD 93-21, Grovers Avenue Lateral
Upper East Fork Cave Creek Design

Dear Mr. Friedhoff:

The Flood Control District has reviewed your 90% Submittal dated November 3, 1994, and collected the review comments from the City of Phoenix. Following are comments that we have listed. Along with this list of comments, blueines sets are enclosed with additional comments from the District and the City of Phoenix.

GENERAL COMMENTS

1. Increase the text size of the construction notes and call outs on the plans; at half-size, the text is hard to read (this comment was also made on the 60% submittal; a sample half-size is included with the enclosures).
2. All waterlines crossing the storm drain and connector pipes 18" and larger shall be replaced with DIP rather than be supported.
3. Water services and sewer taps crossing the mainline need only temporary supports, which are not a pay item.
4. Hatch and cross hatch to reflect new concrete sidewalk and new concrete driveways, respectively, per City of Phoenix Drafting Standards.
5. The type of survey monuments are not called out for all of the centerline monuments. If a marker is missing, "nt fd" should be called out.
6. Call out for Type I backfill for all of the storm drain, and include a special provision describing Type "F" backfill modification.
7. Pavement replacement quantity and type should be called out in the plans for the connector pipes.

Cover Sheet

1. Include signature lines for City of Phoenix Approvals: Assistant Street Transportation Director and Deputy Street Transportation Director.
2. Update the Title Block on the Cover Sheet: Tom Rawles is the Chairman and Don Stapley is the representative for District 2.

Sheet 2

1. Include "B" enclosed in a circle to the symbol in the legend for the replacement and/or adjustment of the existing water valve. In some places throughout the plan, a construction note was used instead of the symbol.

Sheet 3

1. 40' of R/W has been obtained along the south side of the roadway adjacent to the 25 W.E.
2. 25' TCE is being acquired on the north side of the roadway through the Contention Mining Claim.

Sheet 4

1. Add the opening for the connector in MH No. 8.
2. A TCE has been obtained to construct the catch basin on the Val Vista School property. The TCE measures 60 (N-S) x 105 (E-W).

Sheet 5

1. Remove the connector pipes extending from the top of pipe in the profile.
2. 22' dimension call out immediately beyond MH No. 1 and at approximately Sta 1+ 50 appear to contradict each other. Is the FC at 22' Lt?
3. Add (") after 30 in Note 16.

Sheet 6

1. Provide a minimum slope with grades for the drainage ditch on the north side of the road.

Sheet 7

1. Call out "7" in the plan should be 6.
2. Call out the adjoining street name.
3. The manhole shaft location in the plan does not agree with the detail.
4. Note No. 1: include "MH" between BOX and #3.
5. Note No. 2: replace "and" with "to".
6. In the Sheet Summary, insert "water" between cross-tie and pipe.
7. Include note on 6" waterline, " Waterline to be protected in place."
8. 40' R/W has been acquired on the south side of the roadway.

Sheet 8

1. Include note on 6" waterline, "Waterline to be protected in place."
2. 40' R/W has been acquired on the south side of the roadway.

Sheet 9

1. Include note on 6" waterline, "Waterline to be protected in place."
2. Sta 20+40, no support is required; the sewerline crosses underneath the connector pipe.

Sheet 10

1. Insert "28TH ST" in the cross reference information for the SD.

Sheet 12

- 1 Sta 37+75, no support is required; the sewerline crosses underneath the connector pipe.

Sheet 14

1. In the Catch Basin and Pipe Connection Table, add "modified" to the catch basin type and cross reference the detail. Is this detail for all basins in a series?
2. In plan view of the series of catch basins, there appears to be a wall between the basins; the detail shows this being deleted. Do other basins that are in a series have the adjoining walls removed?
3. Pvmt replacement is required between the mainline and the beginning of new pvmt.

Sheet 15

1. How are the basins connected? See comments for previous sheet.
2. Plot the easement to construct the catch basin on the school property (see enclosure).
3. Pvmt replacement is required between the mainline and the beginning of new pvmt.

Sheet 16

1. Pvmt replacement is required between the mainline and the beginning of new pvmt.

Sheet 17

1. In the Catch Basin and Pipe Connection Table, add "modified" to the catch basin type and cross reference the detail.
2. In the Pipe Typical Section, the SD size is called out incorrectly.
3. The SS does not cross the SD, Sta 1+18 +/-.
4. Pvmt replacement is required between the mainline and the beginning of new pvmt.

Sheet 18

1. Increase the line wt of the new SS to make it stand out more.
2. Abandon in place the SS between the MH's at the beginning of the relocation and call out for plugs to be placed in the end of the abandoned pipe. These should be incidental to the other work.

Letter to Bruce Friedhoff, P.E.
Reference: Contract FCD 93-21
Page 4

Sheet 19

1. The CATV that is shown to be relocated in Conn. Profile Sta 2+35 is not shown correctly; this utility is 33' It of ML.
2. The profiles do not reflect the walls to be constructed behind the SW. The COP is concerned about bicycle safety with this low wall. Before any changes are made to the wall, let's meet to discuss it.

Sheet 26

1. Change reinforcing from #6@12" each way to #6@8" each way, for the bottom mat of Roof Slab Junction Structure at Sta 0+71.

Sheet 27& 28

1. Change reinforcing from #5@12" each way to #5@8" each way, for the bottom mat of the Roof Slab Junction Structures at Sta 12+98 and Sta 26+46.

Sheet 30

1. The Geotechnical Investigation does not state that CIPP is not allowable. It states that CIPP may not be feasible. Include it as an alternate; the contractor bears the liability with any alternate.

Sheet 32, 33, 34

1. Change the width of the s/w that are adjacent to the new outside curb to 5" and transition back to 4' beyond the curb. State that CIPP is not allowable, instead of that CIPP may not be feasible.
2. The order of these sheets does not fit well into the plan sets.

For the most part, the submittal looked good. A number of issues need to be resolved before wrapping up the design. Please call to arrange for a comment review meeting within one week of receipt of this letter and be prepared to discuss these comments at the meeting before proceeding any further. Bring the marked-up blue lines with you to the meeting and also return them with your next submittal. If you have any questions, please call me at 506-8742.

Sincerely,



Michael A. Lopez, P.E.
Project Manager

Enclosures

RECEIVED DEC 07 1994

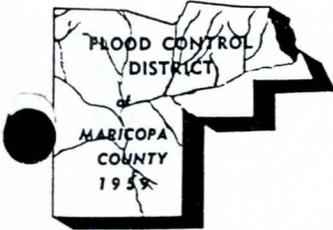
FLOOD CONTROL DISTRICT

of

Maricopa County

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DEC 05 1994

Ms. Lois Winkler
Arizona Public Service Company
Mail Station 3539
P.O. Box 53933
Phoenix, AZ 85072-3933

SUBJECT: GROVERS AVENUE STORM DRAIN LATERAL - CAVE CREEK ROAD TO 30TH WAY
FCD PROJECT No. 93-21
CITY OF PHOENIX INDEX No. ST-930289

Dear Ms. Winkler:

Enclosed is a set of 90% plans for the above project. Please review the plans and forward comments to me by December 19, 1994.

We hope to finalize our plans by January 1995, and the City of Phoenix plans to bid this project in the spring of 1997; however, there is a possibility that this project could be bid as early as the summer of 1996 if funds become available.

Our review does not indicate any direct conflicts with APS, but there are numerous locations where our facilities are in close proximity to yours. The attached chart shows locations that are close.

Sheet 32 shows the paving plan and profile for 26th Street. Please note that we will be lowering the grade in this vicinity by approximately 1 foot. According to APS pothole #1 there are two-1" direct buried electrical cables with a top elevation of 46.85. The new grade at the gutter line will be 49.96. If you require more cover, the line will have to be lowered.

For questions or comments, contact me at 506-8610. Thank you for your cooperation on this project.

Sincerely,

Jan M. Staedicke
Utility Coordinator

Enclosures

Copy to: Bruce Friedhoff, P.E., Morrison Maierle/ CSSA Inc.

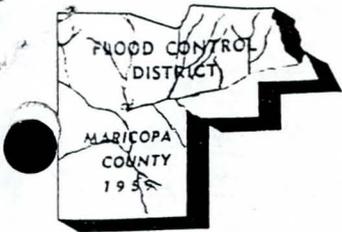
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DEC 05 1994

Ms. Mary Bartholomew, Distribution Engineer
Southwest Gas Corporation
P.O. Box 52075
Phoenix, AZ 85072-2075

SUBJECT: GROVERS AVENUE STORM DRAIN LATERAL - CAVE CREEK ROAD TO 30TH WAY
FCD PROJECT NO. 93-21
CITY OF PHOENIX INDEX NO. ST-930289

Dear Ms. Bartholomew:

Enclosed is a set of 90% plans for the above project. Please review the plans and forward comments to me by December 19, 1994.

We hope to finalize our plans by January 1995, and the City of Phoenix plans to bid this project in the spring of 1997; however, there is a possibility that this project could be bid as early as the summer of 1996 if funds become available.

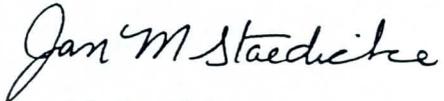
Our review indicates conflicts with Southwest Gas at the following locations:

- 1) Station 27+23, 35.8' RT – there is a 2" gas line which must be relocated to accommodate a catch basin. We have enclosed pothole results which verified the location. Incidentally, this is not plotted correctly on sheet we, but in any case it must be relocated.
- 2) Station 35+25, 35' RT – the 2" gas line must be relocated to accommodate a catch basin. Although this location was not potholed, it seems likely that the offset from monument line would have remained constant. (The catch basins at this station and at station 43+10 have been added since our last plan submittal).
- 3) Station 43+10, 35' RT – the 2" gas line must be relocated to accommodate a catch basin.

Please review the plans and advise me if there are conflicts in addition to those noted above.

For questions or comments, contact me at (602) 506-8610. Thank you for your cooperation on this project.

Sincerely,



Jan M. Staedicke
Utility Coordinator

Enclosures

Copy to: Bruce Friedhoff, P.E., Morrison Maierle/CSSA Inc.

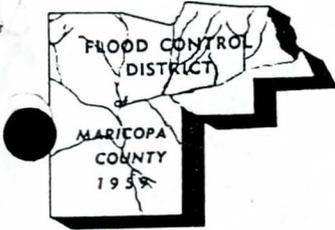
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DEC 05 1994

Liaison Manager
USWest Communications
2233 West Dunlap
Phoenix, AZ 85021

SUBJECT: GROVERS AVENUE STORM DRAIN LATERAL - CAVE CREEK ROAD TO 30TH WAY
FCD PROJECT NO. 93-21
CITY OF PHOENIX INDEX NO. ST-930289

Dear Sir or Madam:

Enclosed are two sets of 90% plans for the above project. Please review the plans and forward comments to me by December 19, 1994. I have also enclosed pothole results for your use.

We hope to finalize our plans by January 1995, and the City of Phoenix will bid this project in the spring of 1997; however, there is a possibility that this project could be bid as early as the summer of 1996 if funds become available.

Our review indicates conflicts with USWest at the following locations:

- 1) Between stations 0+55 and 3+30, 21' LT – there is a 5" telephone conduit that must be relocated.
- 2) Between stations 0+55 and 3+30, 31' LT – there is a direct buried cable that our consultant has designated as protect-in-place; however, it appears that it must be relocated between stations 0+65 to 0+72 to accommodate the junction structure shown on sheet 23, profile 29 at station 0+67.
- 3) Between stations 6+30 and 9+33, 5' RT – there is a direct buried cable that must be relocated. There is 40' of road right-of-way on the south side of the section line, and we recommend that the telephone cable be relocated into this area. USWest's buried facility maps indicate there is a telephone easement for this segment of line, so this relocation is probably reimbursable. Please provide us a copy of your prior rights documentation, a rough cost estimate for this relocation along with your review comments, and follow up with a relocation plan and detailed cost estimate.

- 4) At station 9+42, 21' LT – there is a telephone cable that has been designated as "to be relocated by others."
- 5) At station 20+ 40, 21' LT – there is a telephone conduit that must be relocated to accommodate a connector pipe.
- 6) At station 37+75, 21' LT – there is a 5" telephone conduit that must be relocated to accommodate a connector pipe.

Please review the plans and advise me if there are conflicts in addition to those noted above. For questions or comments, contact me at (602) 506-8610. Thank you for your cooperation on this project.

Sincerely,



Jan M. Staedicke
Utility Coordinator

Enclosures

Copy to: Bruce Friedhoff, P.E., Morrison Maierle/ CSSA Inc.

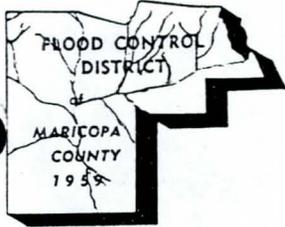
FLOOD CONTROL DISTRICT

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DEC 05 1994

Mr. Carl McKay
Dimension Cable
115 N. 51st Avenue
Phoenix, Arizona 85043

SUBJECT: GROVERS AVENUE STORM DRAIN LATERAL - CAVE CREEK ROAD TO 30TH WAY
FCD PROJECT NO. 93-21
CITY OF PHOENIX INDEX NO. ST-930289

Dear Mr. McKay:

Enclosed is a set of 90% plans for the above project. Please review the plans and forward comments to me by December 19, 1994. I have also enclosed pothole results for your use.

We hope to finalize our plans by January 1995, and the City of Phoenix plans to bid this project in the spring of 1997; however, there is a possibility that this project could be bid as early as the summer of 1996 if funds become available.

Our review indicates conflicts with Dimension Cable at the following locations:

- 1) Station 0+55 to 1+85, 21' LT – there is a 2.5" conduit that must be relocated.
- 2) Station 27+23, 38.2' RT – our consultant has designated your direct buried cable "to be relocated by others." This is not plotted correctly on sheet 23, it is less than 1' from the back of the catch basin. This location was potholed, and it appears the cable can be protected in place. What is your opinion?
- 3) Station 35+25, 38' RT – our consultant has designated your direct buried cable "to be relocated by others."
- 4) Station 37+75, 29' LT – our consultant has designated your conduit "to be relocated by others."
- 5) Station 43+10, 38' RT – our consultant has designated your conduit "to be relocated by others."

- 6) Station 12+60 to 13+20, 49' LT – according to testhole #3 the top of your 2.5" conduit is at elevation 1449.20. The bottom of our catch basin wing will be at elevation 1447.96, so you will need to lower your conduit across 26th Street. The pavement grade is being lowered in this area; see the paving plan and profile on sheet 32.

Please review the plans and advise me if there are conflicts in addition to those noted above. For questions or comments, contact me at (602) 506-8610. Thank you for your cooperation on this project.

Sincerely,



Jan M. Staedicke
Utility Coordinator

Enclosures

Copy to: Bruce Friedhoff, P.E., Morrison Maierle/ CSSA Inc.



City of Phoenix
WATER SERVICES DEPARTMENT
Water Engineering Division

November 21, 1994

Mr. Bruce J. Friedhoff, P.E.
Morrison-Maierle/CSSA, Inc.
4621 North 16th Street, Suite D-401
Phoenix, Arizona 85016

RE: GROVERS AVENUE STORM DRAIN LATERAL - CAVE CREEK ROAD TO 30TH WAY

Dear Mr. Friedhoff:

We have reviewed the 90% plans for the proposed storm drain in Grovers Avenue. Comments are listed on the enclosed sheet and on a copy of the plans.

If you have any questions regarding our comments, please call me at 261-8229.

Sincerely,

Gerald K. Arakaki
Gerald K. Arakaki, P.E.
Civil Engineer III

GA/dkt

Enclosures

c: Michael Lopez (FCDMC)

ga2bf22.nov

GROVERS AVENUE STORM DRAIN LATERAL
90% REVIEW COMMENTS

Sheet

Comments

- | | |
|----|--|
| 7 | Sta. 13+05 - The existing 5" valve was installed on the 6" water line with a tapping sleeve. The valve cannot be removed without replacing a section of the 6" pipe. Recommend that the existing valve be closed, plugged, and abandoned and a new tapping sleeve and valve be installed on the 6" main. |
| 35 | Adjust existing valve boxes to grade with Type "A" installation when they are subject to vehicular traffic and Type "B" installation in non-traffic areas. |

Where the new storm drain crosses under existing ACP water lines, the plans were revised to install permanent pipe supports under the ACP mains rather than replacement with DIP. Our policy has been to replace the section of ACP with DIP. We have had problems in the past with ACP lines breaking if there is any settlement of the storm drain trench following construction.



FLOOD CONTROL DISTRICT

OF MARICOPA COUNTY

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COVER SHEET

TO: Jim McKenzie

Company or Department: Morrison/Maierle Fax # 279-2554

FROM: Jan Staedicke

Number of pages being sent including Cover Sheet: _____

Comments: Utility Contacts

<u>APS Electric</u>	<u>John Herrera</u>	<u>846-8758</u>
<u>US West Comm</u>	<u>Curt Sayer</u>	<u>831-9777</u>
<u>Southwest Gas</u>	<u>Paul McLaughlin</u>	<u>484-5649</u>
<u>Dimension Cable</u>	<u>Carl McKay</u>	<u>352-5860 ext 155</u>

Fax Cover Sheet

FLOOD CONTROL DISTRICT Of Maricopa County

2801 West Durango Street • Phoenix, Arizona 85009
Telephone (602) 506-1501
Fax (602) 506-4601
TDD (602) 506-5897

To: Bruce Friedhoff

Company or Dept: MM/GSSA Fax # 279-2554

From: Michael Lopez

Number of Pages Being Sent Including Cover Sheet: 9

If there are any problems, please call (602) 506-1501.

Comments: Here is the results that you requested regarding trench stability. Please let me know if you have any questions.
MJL

SPEEDIE AND ASSOCIATES

GEOTECHNICAL / ENVIRONMENTAL / MATERIALS ENGINEERS

11029 N. 24th AVE., SUITE 805 • PHOENIX, ARIZONA 85029 • (602) 997-6391 • FAX (602) 943-5508

HENRIETTA SPEEDIE, B.S.
JAMES A. SPEEDIE, P.E.
GREGG A. CREASER, P.E.
BRETT P. CREASER, P.E.

July 26, 1994

Mr. Warren Rosebraugh
Flood Control District of
Maricopa County
2801 West Durango Street
Phoenix, Arizona 85009

RE: Project No. 930314SA
Assignment No. 4
Grovers Avenue Storm Drain Lateral

Dear Warren:

We have reviewed the above referenced report in response to questions regarding trench stability.

Based on the soils encountered in the boreholes, it is our opinion that the site soils are classified as Type A in accordance with OSHA 29 CFR Part 1926 Excavations Final Rule. Trenching and/or bracing should performed in accordance with those standards, a portion of which is attached.

Should you have any questions or need additional assistance, please do not hesitate to call.

Respectfully submitted,

SPEEDIE & ASSOCIATES

Gregg A. Creaser, P.E.



GAC:bg

Enclosure

cc: Bruce Friedhoff - Morrison Maierle/CSSA

FLOOD CONTROL DISTRICT RECEIVED

JUL 29 '94

CHENG	P & PM
DEP	HYDRO
ADMIN	LMST
FINANCE	FILE
CEO	
ENGR	
REMARKS	

TABLE B-1
MAXIMUM ALLOWABLE SLOPES

SOIL OR ROCK TYPE	MAXIMUM ALLOWABLE SLOPES (H:V) [1] FOR EXCAVATIONS LESS THAN 20 FEET DEEP [3]
STABLE ROCK TYPE A [2] TYPE B TYPE C	VERTICAL (90°) 3/4 : 1 (53°) 1 : 1 (45°) 1½ : 1 (34°)

NOTES:

1. Numbers shown in parentheses next to maximum allowable slopes are angles expressed in degrees from the horizontal. Angles have been rounded off.
2. A short-term maximum allowable slope of 1/2H:1V (63°) is allowed in excavations in Type A soil that are 12 feet (3.67 m) or less in depth. Short-term maximum allowable slopes for excavations greater than 12 feet (3.67 m) in depth shall be 3/4H:1V (53°).
3. Sloping or benching for excavations greater than 20 feet deep shall be designed by a registered professional engineer.

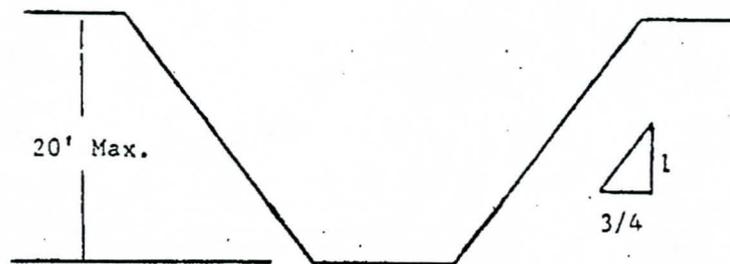
Figure B-

Slope Configurations

(All slopes stated below are in the horizontal to vertical ratio)

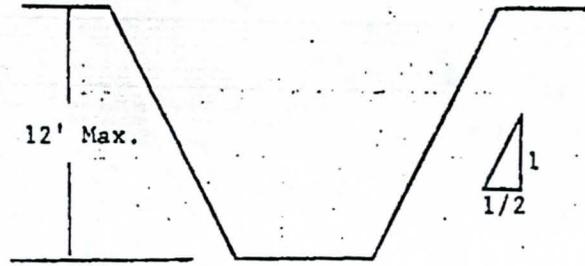
B-1.1 Excavations made in Type A soil.

1. All simple slope excavation 20 feet or less in depth shall have a maximum allowable slope of ¾:1.



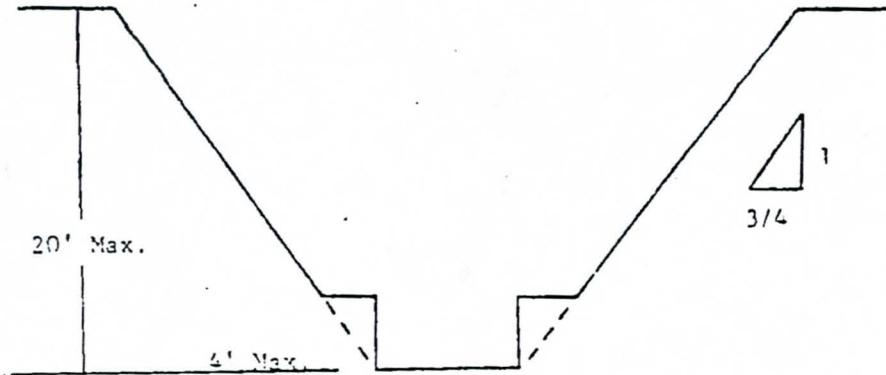
Simple Slope—General

Exception: Simple slope excavations which are open 24 hours or less (short term) and which are 12 feet or less in depth shall have a maximum allowable slope of ½:1.

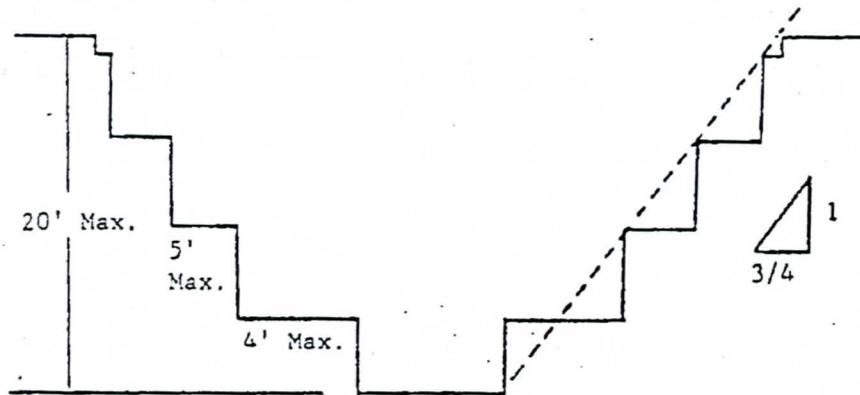


Simple Slope—Short Term

2. All benched excavations 20 feet or less in depth shall have a maximum allowable slope of 3/4 to 1 and maximum bench dimensions as follows:

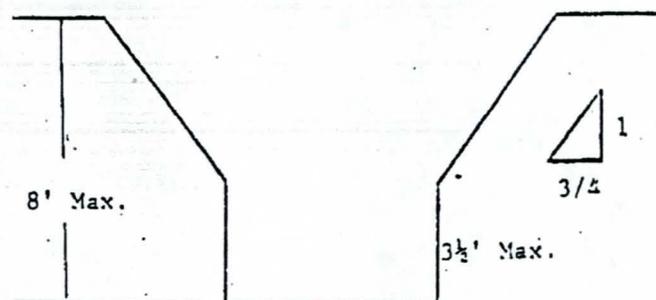


Simple Bench



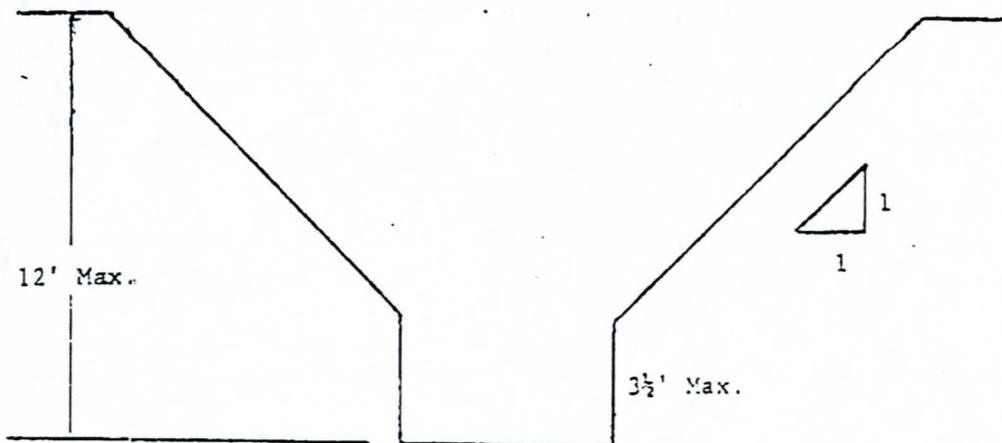
Multiple Bench

3. All excavations 8 feet or less in depth which have unsupported vertically sided lower portions shall have a maximum vertical side of 3 1/2 feet.



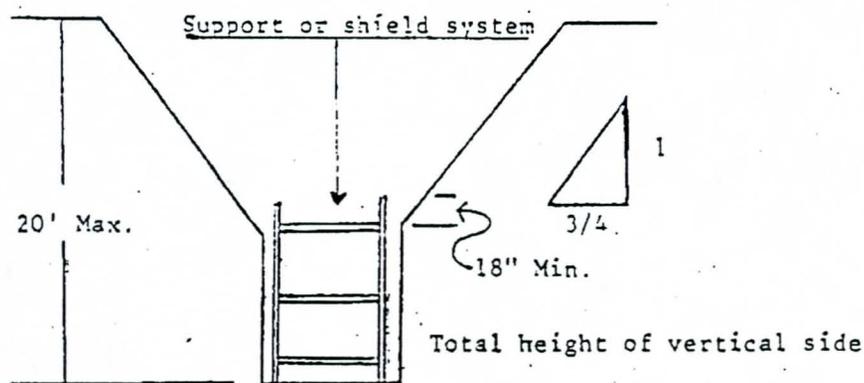
Unsupported Vertically Sided Lower Portion—Maximum 8 Feet in Depth

All excavations more than 8 feet but not more than 12 feet in depth which unsupported vertically sided lower portions shall have a maximum allowable slope of 1:1 and a maximum vertical side of 3½ feet.



Unsupported Vertically Sided Lower Portion—Maximum 12 Feet in Depth

All excavations 20 feet or less in depth which have vertically sided lower portions that are supported or shielded shall have a maximum allowable slope of ¾:1. The support or shield system must extend at least 18 inches above the top of the vertical side.

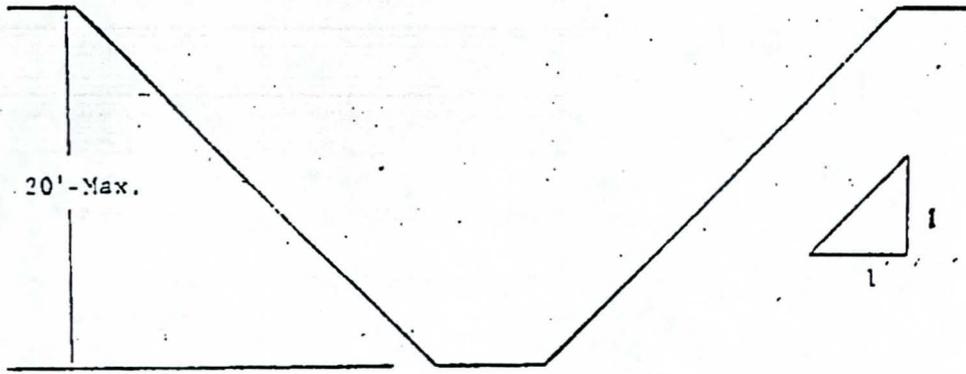


Supported or Shielded Vertically Sided Lower Portion

4. All other simple slope, compound slope, and vertically sided lower portion excavations shall be in accordance with the other options permitted under § 1928.652(b).

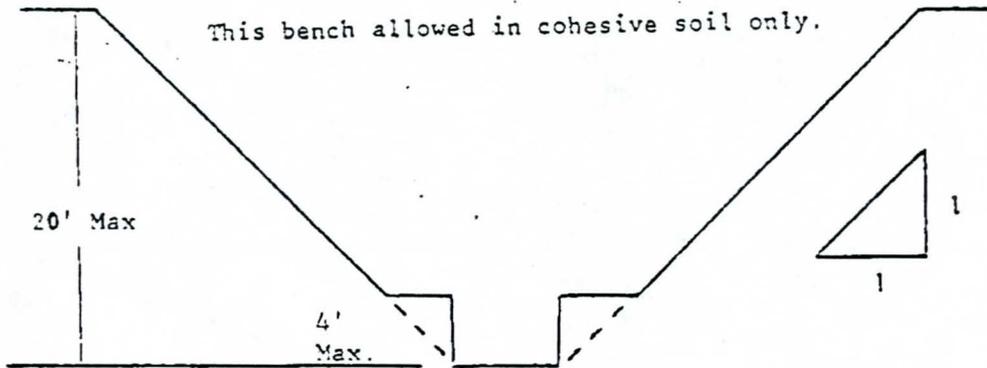
B-1.2 Excavations Made in Type B Soil

1. All simple slope excavations 20 feet or less in depth shall have a maximum allowable slope of 1:1.

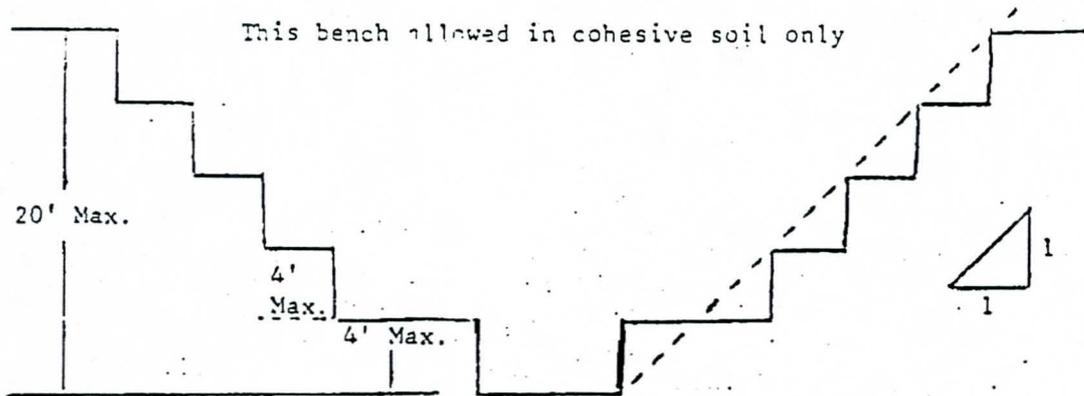


Simple Slope

2. All benched excavations 20 feet or less in depth shall have a maximum allowable slope of 1:1 and maximum bench dimensions as follows:

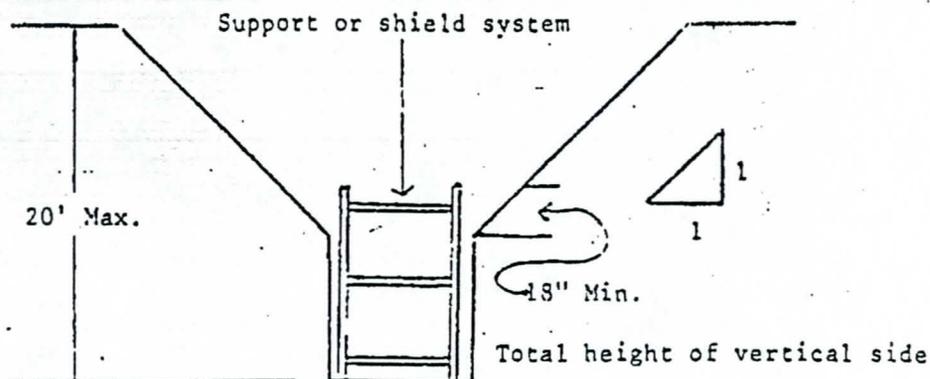


Single Bench



Multiple Bench

3. All excavations 20 feet or less in depth which have vertically sided lower portions shall be shielded or supported to a height at least 18 inches above the top of the vertical side. All such excavations shall have a maximum allowable slope of 1:1.

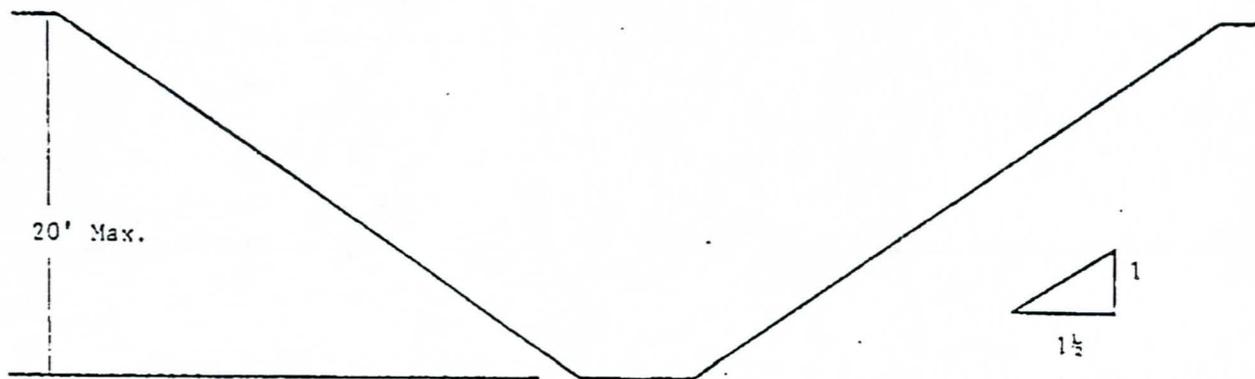


Vertically Sided Lower Portion

4. All other sloped excavations shall be in accordance with the other options permitted in § 1926.652(b).

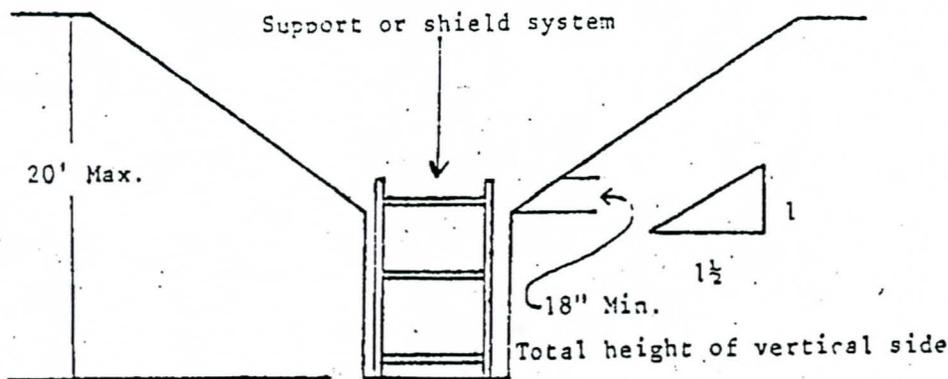
B-1.3 Excavations Made in Type C Soil

1. All simple slope excavations 20 feet or less in depth shall have a maximum allowable slope of 1½:1.



Simple Slope

2. All excavations 20 feet or less in depth which have vertically sided lower portions shall be shielded or supported to a height at least 18 inches above the top of the vertical side. All such excavations shall have a maximum allowable slope of 1½:1.

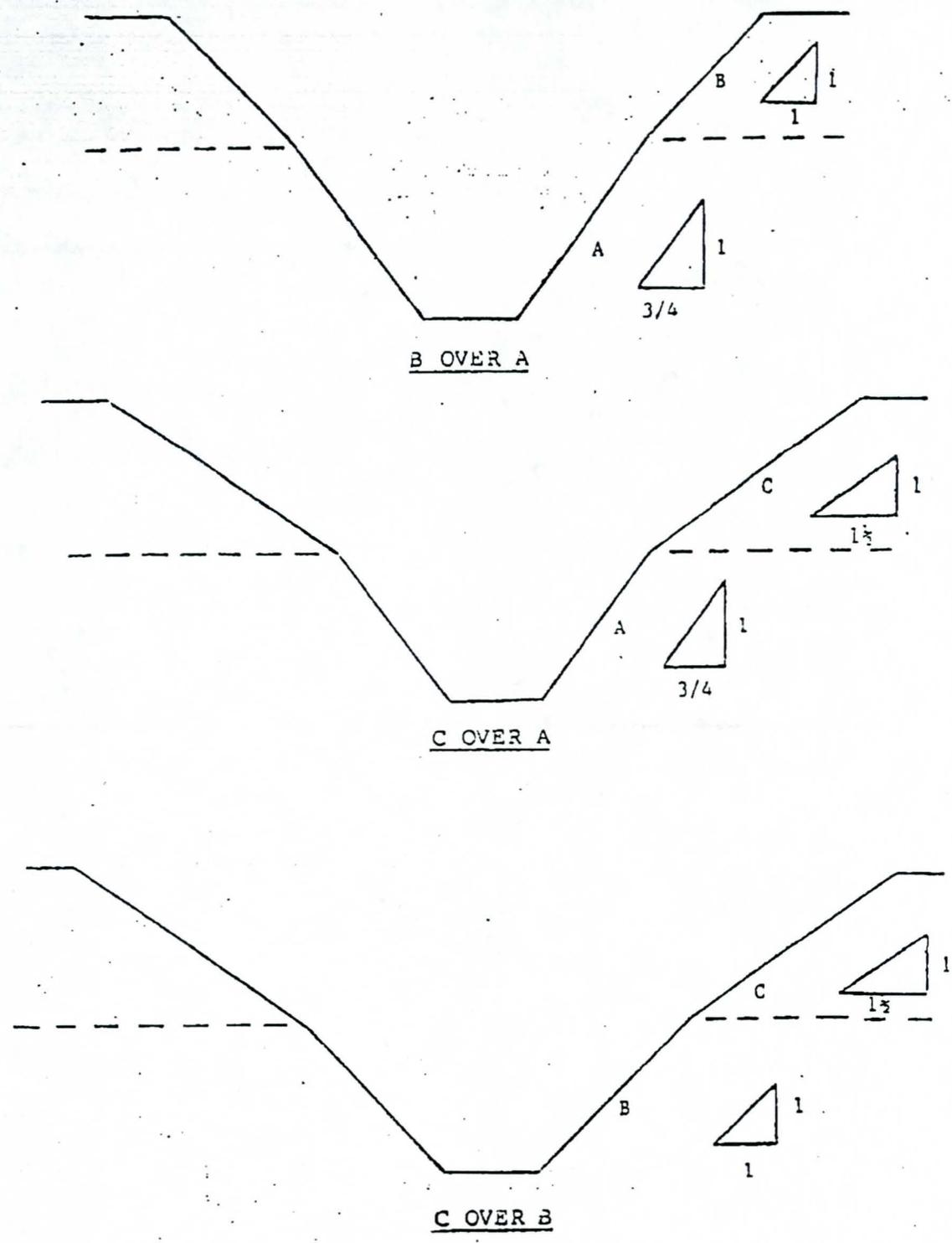


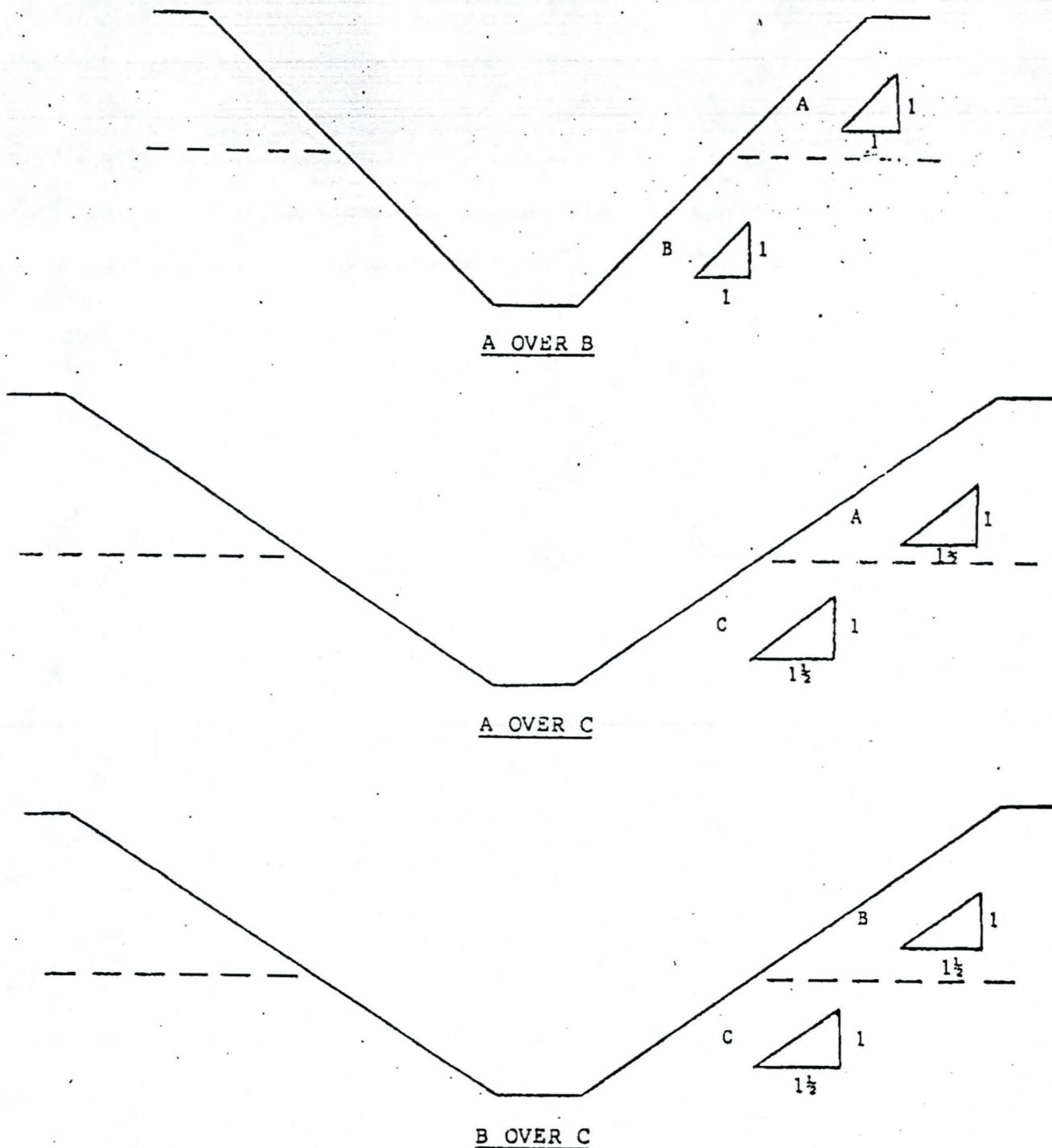
Vertical Sided Lower Portion

3. All other sloped excavations shall be in accordance with the other options permitted in § 1926.652(b).

B-1.4 Excavations Made in Layered Soils

1. All excavations 20 feet or less in depth made in layered soils shall have a maximum allowable slope for each layer as set forth below.





2. All other sloped excavations shall be in accordance with the other options permitted in § 1926.652(b).

Appendix C to Subpart P
Timber Shoring for Trenches

(a) *Scope.* This appendix contains information that can be used timber shoring is provided as a method of protection from cave-ins in trenches that do not exceed 20

feet (6.1 m) in depth. This appendix must be used when design of timber shoring protective systems is to be performed in accordance with § 1926.652(c)(1). Other timber shoring configurations; other systems of support such as hydraulic and pneumatic systems; and other protective systems such as sloping, benching, shielding, and freezing

systems must be designed in accordance with the requirements set forth in § 1926.652(b) and § 1926.652(c).

(b) *Soil Classification.* In order to use the data presented in this appendix, the soil type or types in which the excavation is made must first be determined using the soil

Subject: Grovers Ave. Storm Drain
60% Review
Meeting Minutes

Attendees: Mike Lopez, PE
John Bethell, PE
Ralph Goodall, PE
Bruce Friedhoff, PE
Alex Batt, PE

Date: Monday, August 1, 1994
C.O.P. Conference Rm. A

A meeting was held to discuss review comments on the 60% plan submittal. Only select items were discussed which needed clarification or interpretation. The following summarizes the items discussed at the meeting and any decisions reached.

Index on Cover Sheet.- Normally City would place on Cover Sheet but will accept it on Sheet 2 as it is already located there.

Trench Details.- No trench limits required to be shown.

Permanent Pipe Support.- Call out per Detail 403. Leave it contractors option to use a particular type (concrete support or DIP). Do not need to show support in profile.

26th St. Lateral.- May need to adjust location of water line cross over (connection between 36" Stl. Cyl. and 6" ACP). Storm Drain lateral is located to minimize utility disruptions and can remain where shown.

24th St.- Reconstruct Grovers Ave. at Cave Ck. to drain to new catch basins. Relocate existing catch basin to Grovers Ave. future south curb line. Extend existing connector pipe. Replace valley gutter if drainage is not intercepted before crossing 24th St.

30th Way Lateral.- C.O.P. recommends using 48" RCP in-lieu-of 42", removing manholes and utilizing offset T's at catch basin connector locations. Minimum spacing of 5' needs to be used and catch basin sumps offset from each other.

6" Water Line Relocation.- Water line relocation (approx. 1100 lf.) will not be shown on the plans for the reason that it is a construction value engineering element. A specification will be provided which gives the contractor the flexibility of relocating the water line or constructing the storm drain utilizing methods which will not impact the existing line. A draft version of the specification is included. Cost of protecting or relocating is to be included in the storm drain unit cost.

Water Line Relocation

6" Water Line Adjacent to Grovers Ave. Storm Drain

The contractor shall be responsible for all water line relocation.

The contractor shall have the option of relocating the existing 6" water line, from Sta. 9+35 to Sta. 20+20 to construct the new storm drain.

If the option of relocating the water line is selected by the contractor, the water line shall be located such that no portion of the pipe is within 6' of any sanitary sewer. The work will include new pipe and fittings, all connections, ties and cross overs. The contractor shall provide shop drawings for approval.

The cost of this work shall be incidental to the cost of the storm drain and shall include all labor and materials necessary to relocate the water line, complete in place, to City of Phoenix Water Services Department standards and requirements.

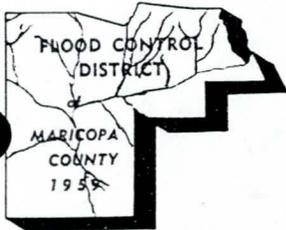
FLOOD CONTROL DISTRICT

of

Maricopa County

2801 West Durango Street • Phoenix, Arizona 85009
Telephone (602) 506-1501
Fax (602) 506-4601
TT (602) 506-5859

BOARD OF DIRECTORS
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Mr. Bruce Friedhoff, P.E.
Office Manager
Morrison Maierle/CSSA
4621 North 16th Street, Suite D-401
Phoenix, Arizona 85016

Re: Contract FCD 93-21, Grovers Avenue Lateral
Upper East Fork Cave Creek Design

Dear Mr. Friedhoff:

The Flood Control District has reviewed the plans of your 60% submittal dated June 20, 1994. Following are comments that we have listed. Along with this list of comments, blueline sets are enclosed with additional comments from the District and the City of Phoenix. A comment review meeting is scheduled for July 19 at 9:30 am at the District to discuss these comments with you. Please bring the marked-up bluelines with you to the meeting and return them with your next submittal. Final comments of the report and specifications are not complete at this time. I will forward them to you at a later date.

General Comments

1. Increase the text size of the construction notes and call outs on the plans; at half-size, the text is hard to read.
2. Reduce the number of existing grades shown on the plans; they tend to clutter the drawings. Leave enough elevations for the contractor to replace what might be lost during construction of the lateral, but don't place existing elevations on items that will not be effected.
3. Not enough labeling of all the line work on the plans. Call out edges of pavements, dirt ditches, etc. The centerline should be a thicker line so that it stands out.
4. References to other sheets should be placed on each plan sheet indicating where the connector pipe profile can be found, or paving sheet if it applies, or any other sheet that corresponds to a particular plan sheet.
5. Symbols used for the existing monuments or new monument on the plans are not the same as shown in the legend. Some abbreviations do not correspond with those used by the COP or MAG.

Mr. Bruce Friedhoff, P.E.
Office Manager, Morrison Maierle/CSSA
Contract FCD 93-21, Grovers Avenue Lateral
Upper East Fork Cave Creek Design
Page 2

6. The construction notes for the catch basins and connector should show the complete description of the catch basin, P-1569-M -?, L=?, the connection type, and the length of connector pipe. Use the full width of the area designated for construction notes.
7. Do not call out the elevations of the monuments that are to be disturbed by the project.
8. Add catch basins along the lateral to catch the 2-year flows at the COP's minimum spacing and at the end of the upstream returns facing Grovers. These catch basins do not have to be analyzed as part of the 100-year lateral hydraulics.
9. Preliminary details were supposed to be included with the 60% submittal.
10. Use the standard symbology for pipe in the plan views.
11. Remove the HGL from the Storm Drain Plan and Profile sheets.
12. Show the symbol for new concrete where new sidewalks are to be constructed. Use the COP's drafting standards.
13. The 6" & 8" waterline may be too close for the trench to meet OSHA requirements without shoring. A waterline relocation plan should be prepared. We can bid relocation of the waterline as an option to shoring the trench.

Engineering Comments

1. Many abbreviations were used that are not MAG standard abbreviations that do not appear in the legends either. There should be no periods between alphabets if an abbreviation is a MAG type, e.g. DIP instead of D.I.P for ductile iron pipe. Non-standard abbreviations may have periods, but these have to be listed in an abbreviation table.
2. The station numbers were not stated for some items in the construction notes.
3. MAG or COP standard detail numbers were not stated for several items to be constructed.
4. Sheet 5: Connector pipes for Catch Basin No's 27, 28, and 29 do not appear in the profile for the 8' x 8' CBC.
5. Sheet 7: Why is there a sump at the junction of the 8' x 8' CBC and 84" RCP?
6. Sheet 91: Remove construction note 7 which is a repetition of note 6.
7. Sheet 10: Why is there a sump at the junction of the 84" RCP and 48" RCP?
8. Sheet 15: Why is there a sump at the junction of the main storm drain lateral and 84" RCP?
9. Sheet 15: Eliminate the transition by moving the MH south and end the line with a plug. Move the catch basins on the west side of the road south with the others in a series.

Mr. Bruce Friedhoff, P.E.
Office Manager, Morrison Maierle/CSSA
Contract FCD 93-21, Grovers Avenue Lateral
Upper East Fork Cave Creek Design
Page 3

Utility Comments

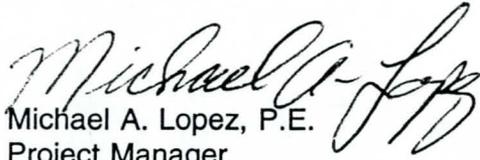
1. Add the following information to the utility notification block and delete the headings for contact date and response date.

APS Electric, John Herrera - 371-6942
US West Communications, Curt Sayer - 395-2415
Southwest Gas Paul McLaughlin - 484-5649
Dimension Cable, Carl McKay - 352-5860

2. Sheet 5: Station 3+52: Plans show a water service at this station. It should also be shown in profile view.
3. Sheet 5: Construction note 14 for pipe support refers to a location where there is no crossing pipe in the plan view.
4. Sheet 6: Station 6+59 - The telephone line should also be shown in the profile view.
5. Sheet 10: Station 27+23 - Need a connector pipe profile to see if this conflicts with the 36" water, cable TV, or 2" gas.
6. Sheet 14: Revise the electric and telephone locations to reflect the pothole information from APS.
7. Sheet 14: Label the Cable TV on the north side of Grovers.
8. Sheet 15: Revise to reflect APS pothole data.
9. Sheet 18: Show the telephone lines in profile view between manholes 1 and 2.
10. Sheets 20, 21, and 22: Show the electrical conduits correctly from pothole data. There is approximately 6" clearance from the electrical ducts to the connector pipe. Please lower the connector pipe to provide a minimum 1' clearance.

Please be prepared to discuss these comments at the comment review meeting before proceeding further. The plans did not meet the Districts expectation of a 60% submittal. Instead of asking for a resubmittal of the 60% plans, the corrections should be made and the necessary information contained on the plans for the 90% submittal. If you have any questions, please call me at 506-8742.

Sincerely,


Michael A. Lopez, P.E.
Project Manager

MAL/lbw



City of Phoenix

July 6, 1994

Mr. Bruce J. Friedhoff, P.E.
Morrison-Maierle/CSSA, Inc.
4621 North 16th Street, Suite D-401
Phoenix, Arizona 85016

Re: Grovers Avenue Storm Drain Lateral - Cave Creek Road to 30th Way

Dear Mr. Friedhoff:

We have reviewed the 60% plans for the proposed storm drain lateral in Grovers Avenue. Our comments are listed on the enclosed sheet and noted on the set of redlined plans.

Please note that sheets 23 through 26 were not included in the submittal.

If you have any questions regarding our comments, please contact me at 261-8229.

Sincerely,

A handwritten signature in cursive script that reads "Gerald K. Arakaki".

Gerald K. Arakaki, P.E.
Civil Engineer III

GKA/db

Enclosures

c: Mike Lopez(FCDMC)
E.A.S. Central Files

GROVERS AVENUE STORM DRAIN LATERAL
REVIEW COMMENTS

<u>Sheet</u>	<u>Comments</u>
5	Sta. 1+70 - The existing 6" water line crossing the storm drain trench can be abandoned. Cut & plug the water line at the existing valve. Sta. 2+35 - Replace the existing water line with DIP rather than installing a pipe support. Sta. 3+51 - The existing water service is not shown in the profile.
6	Sta. 6+30 - The water line shown in the profile was not found in our records.
7	Sta. 9+30 - The water line shown in the profile was not found in our records.
10	Sta. 26+60 - The existing 8" water line is DIP and does not have to be replaced.
14	Sta. 1+63, Sta. 1+96, and Sta. 2+29 - The new catch basin connector pipes cross over the existing 8" sewer. Pipe supports will not be required for the sewer pipe.
18	Sta. 0+55 - Add a note to reshape the invert of the existing manhole to provide a smooth flow from the new connection. Sta. 1+57 - The existing water line is DIP and does not have to be replaced. Provide a dimension from the new manhole in 24th Place to the existing manhole upstream.



City of Phoenix
WATER SERVICES DEPARTMENT
Water Engineering Division

June 6, 1994

Mr. Bruce J. Friedhoff, P.E.
Morrison-Maierle/CSSA, Inc.
4621 North 16th Street, Suite D-401
Phoenix, Arizona 85016

Re: **Grovers Avenue Storm Drain Lateral - Cave Creek Road to 32nd Street**

Dear Mr. Friedhoff:

We have reviewed the 30% plans for the proposed storm drain lateral in Grovers Avenue. One set of the plans are being returned with the following comments noted.

1. We are concerned that the present alignment of the storm drain may undermine one or both the 36" water line and the 6" water line. Has a geotechnical analysis been performed to determine the stability of the soil during construction?
2. Where the new mainline construction undercrosses existing ACP water lines, the existing ACP lines should be replaced with DIP to a minimum of 5' beyond the limits of the mainline trench excavation.
3. Permanent pipe supports are required wherever the mainline pipe crosses under existing sanitary sewers.
4. Sanitary sewer taps in Grovers Avenue have not been shown on the plans.
5. The plans indicate segments where the storm drain will be installed in existing water easements. Will a drainage easement or public utility easement be required from the property owner?

If you have any questions regarding of our comments, please contact me at 261-8229.

Sincerely,

Gerald K. Arakaki
Gerald K. Arakaki, P.E.
Civil Engineer III

GKA/db

Enclosure

c: Mike Lopez(FCDMC)

**FLOOD CONTROL DISTRICT
OF MARICOPA COUNTY**

3335 West Durango Street
PHOENIX, ARIZONA 85009

(602) 262-1501

HEF (GR) 3.1
LETTER OF TRANSMITTAL

DATE <i>5/9/94</i>	JOB NO.
ATTENTION <i>Bruce Friedhoff</i>	
RE: <i>Gravers Avenue Lateral</i>	

TO MM/CSSA
4621 N 16th St, Ste D-901
Phoenix, AZ 85016

WE ARE SENDING YOU Attached Under separate cover via _____ the following items:

- | | | | | |
|---|---------------------------------------|---|----------------------------------|---|
| <input type="checkbox"/> Shop drawings | <input type="checkbox"/> Prints | <input checked="" type="checkbox"/> Plans | <input type="checkbox"/> Samples | <input type="checkbox"/> Specifications |
| <input type="checkbox"/> Copy of letter | <input type="checkbox"/> Change order | <input checked="" type="checkbox"/> <i>report</i> | | |

COPIES	DATE	NO.	DESCRIPTION
1	5/9		30% review of the plans by COP
1	5/9		" " " design calcs " "

THESE ARE TRANSMITTED as checked below:

- | | | |
|--|--|---|
| <input type="checkbox"/> For approval | <input type="checkbox"/> Approved as submitted | <input type="checkbox"/> Resubmit _____ copies for approval |
| <input checked="" type="checkbox"/> For your use | <input type="checkbox"/> Approved as noted | <input type="checkbox"/> Submit _____ copies for distribution |
| <input type="checkbox"/> As requested | <input checked="" type="checkbox"/> Returned for corrections | <input type="checkbox"/> Return _____ corrected prints |
| <input type="checkbox"/> For review and comment | <input type="checkbox"/> _____ | |
| <input type="checkbox"/> FOR BIDS DUE _____ 19 _____ <input type="checkbox"/> PRINTS RETURNED AFTER LOAN TO US | | |

REMARKS Please return these items with the 60% submittal.

COPY TO _____

SIGNED: Michael A. Lopez

6910-009 3-90

If enclosures are not as noted, kindly notify us at once.

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
 3335 West Durango Street
 PHOENIX, ARIZONA 85009
 506-
 (602) 262-1501

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
 2801 W. Durango
 PHOENIX, AZ 85009

LETTER OF TRANSMITTAL

DATE	4/21/94	JOB NO.	
ATTENTION	Bruce Friedhoff		
RE:	Grover's Avenue Lateral 30% Submittal Review		

TO MM/CSSA
4621 N 16th St, Ste D-401
Phoenix, Az

WE ARE SENDING YOU Attached Under separate cover via _____ the following items:

- Shop drawings Prints Plans Samples Specifications
 Copy of letter Change order _____

COPIES	DATE	NO.	DESCRIPTION
1			1/2 size w/ comments
1			full size w/ comments
1			Draft letter w/ comments

THESE ARE TRANSMITTED as checked below:

- For approval Approved as submitted Resubmit _____ copies for approval
 For your use Approved as noted Submit _____ copies for distribution
 As requested Returned for corrections Return _____ corrected prints
 For review and comment _____
 FOR BIDS DUE _____ 19 _____ PRINTS RETURNED AFTER LOAN TO US

REMARKS Overall a good looking set of plans.
Let's get together next week to schedule
a meeting. I've penciled in 9:00 am on
4/27. I'll firm that up after you've had
a chance to look at the plans.

COPY TO _____

SIGNED: Michael [Signature]

FLOOD CONTROL DISTRICT

of

Maricopa County

2801 West Durango Street • Phoenix, Arizona 85009

Telephone (602) 506-1501

Fax (602) 506-4601

TDD (602) 506-5897

BOARD OF DIRECTORS

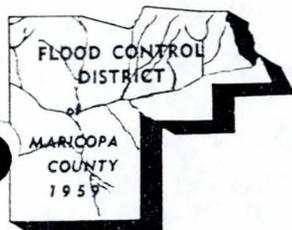
Betsey Bayless

James D. Bruner

Ed King

Tom Rawles

Mary Rose Garrido Wilcox



Neil S. Erwin, P.E., Chief Engineer and General Manager

APR 21 1994

Mr. Bruce Friedhoff, P.E.
Office Manager
Morrison Maierle/CSSA
4621 North 16th Street, Suite D-401
Phoenix, Arizona 85016

SUBJECT: Contract FCD 93-21, Grovers Avenue Lateral
Upper East Fork Cave Creek Design

Dear Mr. Friedhoff:

The Flood Control District has reviewed your 30% Plan Submittal dated March 23, 1994. Following are comments that we have listed. Along with these comments, we are sending back bluelines (1 full size and 1 half size) of the 30% submittal with comments. Please return the marked up bluelines with your next submittal.

Engineering Comments

1. The computed length of curb opening numbers 4 and 5 shown in the calculations were 9 feet each for the design discharge, but the selected lengths were 6 feet each (on Table 3.)
2. The 714 feet spacing between Manhole No 2 and 3 exceeded the design criteria of 660 feet.
3. Manholes are located on the major streets where inlets are located. 28th Street, where the most inlets are located, does not have a manhole.
4. More comments appear on drawings.

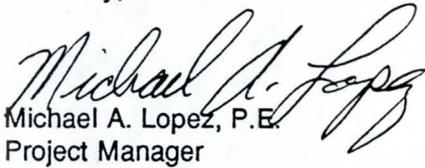
Utility Comments

1. Sheet 5, Station 2+00: Show 8" sewer line in profile view. Also call out pipe supports for the sewer line and water lines which cross the storm drain trench (MAG STD DET 403).
2. Sheet 5, Station 0+65 to 3+10: Underground telephone line to be relocated. West end of this line must have been relocated for the detention basin construction.
3. Sheet 5, Station 3+25: Add caution note for overhead electric lines.
4. Sheet 6, station 6+60: Show underground telephone line in profile view.
5. Sheet 6, station 6+60 to 9+34: Underground telephone line is to be relocated. USWest has prior rights for this segment, therefore this will be a project cost. Rough estimate for cost estimating purposes is \$25/LF (274LF x \$25/LF = \$7,000).
6. Please confirm that we are acquiring 40' of road r/w for the City of Phoenix for this segment. USWest will probably need to use this area for their relocation. If we only get a temporary easement or an easement solely for the storm drain, USWest will need to make a separate acquisition. Timing of the r/w acquisition, USWest relocation, and FCD construction will need to be coordinated.
7. Sheet 7: Show a cross section to confirm that the 6" waterline to the north and the 36" waterline to the south can be protected in place during storm drain construction.
8. Sheet 7, station 9+33 and 12+80: show underground telephone lines in profile view.

Mr. Bruce Friedhoff, P.E.
Morrison Maierle/CSSA
Contract FCD 93-21, Grovers Avenue Lateral -
Upper East Fork Cave Creek Design
Page Two

Please be prepared to discuss these comments at the comment review meeting before proceeding further.
I will schedule the meeting once I hear back from you. If you have any questions, please call me at 506-8742.

Sincerely,



Michael A. Lopez, P.E.
Project Manager

Mr. Bruce Friedhoff, P.E.
Office Manager,
Morrison Maierle/CSSA
4621 North 16th Street, Suite D-401
Phoenix, Arizona 85016

Re: Contract FCD 93-21, Grovers Avenue Lateral
Upper East Fork Cave Creek Design

Dear Mr. Friedhoff:

The Flood Control District has reviewed your 30% Plan Submittal dated March 23, 1994. Following are comments that we have listed. Along with these comments, we are sending back bluelines (1 full size and 1 half size) of the 30% submittal with comments. Please return the marked up bluelines with your next submittal.

Engineering Comments

1. The computed length of curb opening numbers 4 and 5 shown in the calculations were 9 feet each for the design discharge, but the selected lengths were 6 feet each (on Table 3.)
2. The 714 feet spacing between Manhole No 2 and 3 exceeded the design criteria of 660 feet.
3. Manholes are located on the major streets where inlets are located. 28th Street, where the most inlets are located, does not have a manhole.
4. More comments appear on drawings.

Utility Comments

1. Sheet 5, Station 2+00: Show 8" sewer line in profile view. Also call out pipe supports for the sewer line and water lines which cross the storm drain trench (MAG STD DET 403).
2. Sheet 5, Station 0+65 to 3+10: Underground telephone line to be relocated. West end of this line must have been relocated for the detention basin construction.
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6. Please confirm that we are acquiring 40' of road r/w for the City of Phoenix for this segment. USWest will probably need to use this area for their relocation. If we only get a temporary easement or an easement solely for the storm drain, USWEST will need to make a separate acquisition. Timing of the r/w acquisition, USWest relocation, and FCD construction will need to be coordinated.
7. Sheet 7: Show a cross section to confirm that the 6" waterline to the north and the 36" waterline to the south can be protected in place during storm drain construction.
8. Sheet 7, station 9+33 and 12+80: show underground telephone lines in profile view.

Please be prepared to discuss these comments at the comment review meeting before proceeding further. I will schedule the meeting once I here back from you. If you have any questions, please call me at 506-8742.

Sincerely

Michael A. Lopez, P.E.
Project Manager

Info: TWL, JMS, KA, MAL

File: AEF(GR)3.1



City of Phoenix
WATER SERVICES DEPARTMENT
PLANNING AND ENGINEERING DIVISION

April 8, 1994

RECEIVED APR 12 1994

Mr. Bruce J. Friedhoff, P.E.
Morrison-Maierle/CSSA, Inc.
4621 North 16th Street, Suite D-401
Phoenix, Arizona 85016

Re: **Grovers Avenue Storm Drain Lateral - Cave Creek Road to 32nd Street**

Dear Mr. Friedhoff:

We have reviewed the plans for the proposed sanitary sewer relocation in Grovers Avenue from Cave Creek Road to 24th Place. We offer the following comments:

1. Indicate that the base of the existing manhole at Sta.0+55 shall be reshaped to produce a smooth flow through the structure.
2. Provide the distance from the new manhole at Sta. 2+01.6 and the first manhole north of Grovers Avenue on 24th Place. This dimension is necessary for us to update our facility maps accurately.
3. Consider extending the new sewer across the trench of the storm drain. The existing VCP sewer will have to be removed to install the box culvert. A permanent pipe support is also required.
4. Indicate the slopes and sizes of the existing sewers connecting to either end of the new work.

A copy of the redlined plan sheet is enclosed. If you have questions regarding any of our comments, please contact me at 261-8229.

Sincerely,

Gerald K. Arakaki

Gerald K. Arakaki, P.E.
Civil Engineer III

Enclosure

c: Michael Lopez(FCDMC)

**FLOOD CONTROL DISTRICT
OF MARICOPA COUNTY**

3335 West Durango Street
PHOENIX, ARIZONA 85009

(602) 262-1501

LETTER OF TRANSMITTAL

TO

Bruce Fridhoff
MM/CSSA

DATE <i>3/4/94</i>	JOB NO.
ATTENTION	
RE: <i>Gravers Ave Lateral</i>	

RECEIVED MAR 7 1994

WE ARE SENDING YOU Attached Under separate cover via _____ the following items:

- Shop drawings Prints Plans Samples Specifications
 Copy of letter Change order _____

COPIES	DATE	NO.	DESCRIPTION
<i>1</i>	<i>1/24/94</i>		<i>COP Review Comment included in Report "Design Concept Report for Gravers Avenue Storm Drain Lateral"</i>

THESE ARE TRANSMITTED as checked below:

- For approval Approved as submitted Resubmit _____ copies for approval
 For your use Approved as noted Submit _____ copies for distribution
 As requested Returned for corrections Return _____ corrected prints
 For review and comment _____
 FOR BIDS DUE _____ 19 _____ PRINTS RETURNED AFTER LOAN TO US

REMARKS

Please review & revise. If you have differences with comments please let me know. Return this report with next submittal.

Thanks

COPY TO _____

SIGNED: *Michael A. [Signature]*

FLOOD CONTROL DISTRICT

of

Maricopa County

2801 West Durango Street • Phoenix, Arizona 85009

Telephone (602) 506-1501

Fax (602) 506-4601

TDD (602) 506-5897

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Tom Rawles

Mary Rose Garrido Wilcox

Neil S. Erwin, P.E., Chief Engineer and General Manager

FEB 15 1994

RECEIVED FEB 17 1994

Mr. Bruce Friedhoff, P.E.
Office Manager
Morrison Maierle/CSSA
4621 North 16th Street, Suite D-401
Phoenix, Arizona 85016

SUBJECT: Contract FCD 93-21, Grovers Avenue Lateral
Upper East Fork Cave Creek Design

Dear Mr. Friedhoff:

The Flood Control District has reviewed your Preliminary Concept Submittal dated January 24, 1994 and have the following comments:

Hydrology Comments

Generally the hydrology looks pretty good; however, a few concerns should be considered before finalizing the design discharges.

1. The input interval for the rainfall distribution used on the IN record was 29 minutes. The City of Phoenix rainfall distribution is for a 30 minute interval for 24-hour storms. Using the consultant's HEC-1 model and changing the IN record from 29 to 30 minutes, the discharges drop slightly (e.g. 503 cfs at point 21.1 becomes 489 cfs). However, the time step, NMIN, used in the HEC-1 model is too long relative to the time of concentrations used in the model and the travel times in many of the routing reaches. The problem created by the longer NMIN is a poorer definition of the peak and the rounding of travel times in short routing reaches to the nearest time interval. When an NMIN of 1 minute is used, along with the large-array version of HEC-1 (in addition to the corrected IN above), the results were slightly different. Subbasin peaks are generally 2 to 3 cfs lower while the combined flows are 5 to 10 cfs lower (e.g. point 21.1 503 cfs vs. 499 cfs). These changes also eliminated the numerous FDKRUT errors in the model associated with the kinematic wave routings. Table 1 below shows the impact of these changes for several points in the watershed.

Table 1 Comparison of Discharges

	M-M/CSSA	w/ IN = 30	IN = 30, NMIN = 1
Location	Qpeak (cfs)	Qpeak (cfs)	Qpeak (cfs)
15.1	81	79	79
18.1	84	82	82
19.1	103	100	101
11.1	165	160	161
12	83	80	81
12.1	245	238	241
20.2	350	340	345
16.1	139	136	139
21.1	503	489	499
22.1	513	499	513

2. The Tc's were calculated using the Papadakis and Kazan regression equation for Tc as presented in the Drainage Design Manual. Although there is nothing inherently incorrect about the use of Papadakis and Kazan with the SCS Unit Dimensionless hydrograph method, the Papadakis and Kazan equation was recommended for use in the Drainage Design Manual as one piece of a package of hydrologic methods which were tested and evaluated as a whole. Likewise, the SCS Unit Dimensionless method belongs to a package of SCS methodologies including the Curve Number and a Tc estimation method based on velocity estimates and distances of flow. Performing some quick SCS-type Tc estimations for a couple of subbasins in this study resulted in Tc's that were slightly longer than the Papadakis and Kazan results reported by M-M/CSSA. The impact of the shorter Tc's in the hydrology as submitted is increased discharges which are not out of the range of reasonability for this area.

3. The discharge flowing south along 28th Street appears to be deep enough near the junior high school to warrant examination of split flows at the intersections just north of Grovers Ave. (e.g. at Libby Street). If such splits do occur, they should be evaluated for their impact on the inlet sizing at 28th and 26th Streets as well as the impact on the pipe sizing from 28th to 26th Streets.

4. The starting hydraulic grade line used by M-M/CSSA is 1439.6 feet. According to NBS/Lowry the 100-year water surface in Basin 3A is 1437.8 feet. Is there a reason for the difference?

5. A rather large portion of the flows contributing at 28th Street pass underneath the junior high school's tennis courts in two large box culverts. The flows appear to enter the bus loading area and a small retention area on the school grounds. Could a more efficient inlet system be designed here in some manner to take advantage of the fact that the water is already concentrated coming out from under the tennis courts?

6. The curve numbers used for basins 18, 19, 20 and perhaps even 21 and 22 need to be re-evaluated. These areas are primarily street ROW. A CN of 83 does not reflect the runoff characteristics of a street very well.

7. The drainage basin maps are not what they could be, especially sheet 2. Most of these appear to be drafting issues. Some are just presentation matters. It appears that some subbasin boundaries (e.g. between basins 11 and 12) are missing, some flow paths (e.g. through basin 15 and 9) are thin lines instead of thick like the majority, some upstream and downstream elevations are missing, the drainage boundary line in the legend does not match those on the map, and the subbasin numbering is hard to find and read. Also, detention basin #4 exists.

Engineering Comments

1. Since only 15 cfs is flowing on 29th Street, it may not be necessary to locate an inlet for this location. If this discharge can be captured on Grovers Avenue, it will eliminate the need for a connector pipe to the main lateral. It is also necessary to come up with an assumption for sizing the proposed 2 inlets on Grovers Avenue. For example, it can be assumed that the grated inlets on the cross streets are 100% clogged. These flow-by's can be used in addition to the 15 cfs for the inlet sizing.

2. In sizing the inlets, after the lengths were determined for the curb openings it would be necessary to revise the calculations using the proposed available standard lengths before sizing the grated inlets. If this were done, it may not be necessary to add grated inlets since the actual available standard lengths may be enough to capture all flows. Conversely, if the selected standard lengths add up to be less than the computed value, then the grates would have to be sized for the revised higher discharge.

3. In determining the effective opening area of the grates in sizing the grated inlets, the opening ratio was omitted. Only the clogging factor was applied to the grate area. The Opening Ratio depends on the grate type selected and can be determined from Chart 11 of HEC-12.

4. There was no indication of the final standard curb openings selected for each of the cross street inlets. Therefore the quantities that appear in the cost estimates section cannot be verified. It is necessary to revise Table 3 to reflect the Catch Basin Types, lengths, and the number of each unit selected.

5. The Mannings 'n' used for street flow calculations for 28th Street appear to be too high and is different from that used for the other streets (0.02 compared to 0.015). A value of 0.012 was also used for 29th Street. A uniform value of 0.015 should be used for all street flow calculations.

6. Regarding the elliptical pipe that connects the lateral to the Detention Basin, the as-built pipe type is corrugated metal pipe (CMP), not the RCP as originally planned.

Mr. Bruce Friedhoff, P.E.
Morrison Maierle/CSSA
Contract FCD 93-21, Grovers Avenue Lateral
Upper East Fork Cave Creek Design
Page Four

7. The split flow computations in Appendix A (pages 16 to 21) need explanation. The formulae involved in each of the columns need to be listed and a few results checked.

Please prepare a written response to each comment and be prepared to discuss these comments at the comment review meeting before proceeding further which we will arrange for next week. If you have any questions, please call me at 506-8742.

Sincerely



Michael A. Lopez, P.E.
Project Manager

FLOOD CONTROL DISTRICT
OF MARICOPA COUNTY

LETTER OF TRANSMITTAL

FLOOD CONTROL DISTRICT
PHOENIX, ARIZONA 85009
OF
MARICOPA COUNTY
2801 W. Durango
PHOENIX, AZ 85009

506-
(602) 1501

DATE	1/31/94	JOB NO.
ATTENTION	Bruce Friedhoff	
RE:	Gravers Av Lateral	

TO MM/CSSA
4621 N 16th St, Ste D401
Phoenix, AZ 85016

RECEIVED FEB 1 1994

WE ARE SENDING YOU Attached Under separate cover via _____ the following items:

- Shop drawings Prints Plans Samples Specifications
 Copy of letter Change order Report

COPIES	DATE	NO.	DESCRIPTION
1	1/18/94		Report on Geotechnical Invest.

THESE ARE TRANSMITTED as checked below:

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 For review and comment _____
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REMARKS _____

COPY TO _____

SIGNED: *Michael D. Lopez*

Fax Cover Sheet

FLOOD CONTROL DISTRICT

Of

Maricopa County

2801 West Durango Street • Phoenix, Arizona 85009

Telephone (602) 506-1501

Fax (602) 506-4601

TDD (602) 506-5897

To: Bruce Friedhoff, P.E.

Company or Dept: MM/CSSA Fax # 279-2554

From: Michael A. Lopez

Number of Pages Being Sent Including Cover Sheet: 6

if there are any problems, please call (602) 506-1501.

Comments: Here's the results from the
borings. When the report comes in, I'll
send you the report. ~~submit it~~



May 24, 1995

Mr. Mike Lopez, P.E.
Planning & Project Management Division
Flood Control District of Maricopa County
2801 West Durango
Phoenix, Arizona 85009

VIA: Delivery

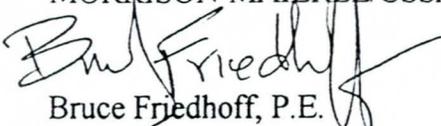
RE: Upper East Fork Cave Creek
Grovers Avenue Lateral
Cave Creek Road to 32nd Street
FCD No. 93-21
COP ST-930289
Job No. 8156.001

We have incorporated all of the review comments from the 90% Submittal and made all of the required corrections. Transmitted herewith are the following Final Construction Documents ready for bid advertising:

Original Plans (35 sheets on 4mil double matte mylar)
Two (2) Half Size Sets of Plans (35 sheets on 11x17 bond scalable at 50%)
Floppy Diskettes containing ".DWG" files
Original Construction Special Provisions (47 Pages on 8-1/2 x 11 bond)
Floppy Diskettes containing Special Provisions in WP 6.0 format
Final Engineer's Construction Cost Estimate (Sealed Envelope)

We will submit Final Reports, Calculations, and copies of correspondence and meeting minutes next week.

MORRISON-MAIERLE/CSSA, INC.


Bruce Friedhoff, P.E.
Office Manager

 5-26-95
RECEIVED BY DATE

Copy: File

May 24, 1995

Mr. Mike Lopez, P.E.
Planning & Project Management Division
Flood Control District of Maricopa County
2801 West Durango
Phoenix, Arizona 85009

VIA: Delivery

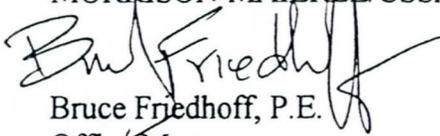
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MORRISON-MAIERLE/CSSA, INC.


Bruce Friedhoff, P.E.
Office Manager

Copy: File

ENGINEER'S COST ESTIMATE

GROVER AVENUE STORM DRAIN LATERAL

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY (FCD #93-21)

CITY OF PHOENIX (ST-930289)

ITEM NO.	DESCRIPTION	UNIT	QTY.	UNIT COST	COST
1	10x10x8 Ft. Junction Structure	EA	1	8,000.00	8,000.00
2	12x12x15 Ft. Junction Structure	EA	1	13,000.00	13,000.00
3	12x12x9 Ft. Junction Structure	EA	1	12,000.00	12,000.00
4	24 Inch Connector Pipe	FT	691	60.00	41,460.00
5	36 Inch Connector Pipe	FT	84	100.00	8,400.00
6	24 Inch Pipe	FT	59	48.00	2,832.00
7	42 Inch Pipe	FT	1,048	84.00	88,032.00
8	48 Inch Pipe	FT	785	96.00	75,456.00
9	60 Inch Pipe	FT	285	150.00	42,750.00
10	84 Inch Pipe	FT	1,506	210.00	316,260.00
11	8 Ft. x 8 Ft. Concrete Box Conduit	FT	1,227	284.00	348,468.00
12	42 x 24 Inch Pre-Fab Tee	EA	3	400.00	1,200.00
13	48 x 24 Inch Pre-Fab Tee	EA	6	450.00	2,700.00
14	60 x 24 Inch Pre-Fab Tee	EA	6	500.00	3,000.00
15	60 x 36 Inch Pre-Fab Tee	EA	4	550.00	2,200.00
16	84 x 24 Inch Pre-Fab Tee	EA	9	700.00	6,300.00
17	8 Inch Vitrified Clay Pipe Sewer Relocation	FT	147	18.00	2,646.00
18	Adjust Valve Box & Cover (MAG 270)	EA	6	250.00	1,500.00
19	Concrete Pipe Collars, 24" & Larger	EA	17	650.00	11,050.00
20	Subgrade Preparation	SY	3,733	1.50	5,600.00
21	Remove and Replace Hydrant	EA	1	600.00	600.00
22	Catch Basin, Type N, Single (P-1570)	EA	5	1,200.00	6,000.00
23	Catch Basin Type M-1, L = 6 (P-1569 Mod.)	EA	2	1,500.00	3,000.00
24	Catch Basin Type M-1, L = 10 (P-1569 Std.)	EA	2	1,600.00	3,200.00
25	Catch Basin Type M-1, L = 17 (P-1569 Std.)	EA	1	2,000.00	2,000.00
26	Catch Basin Type M-1, L = 6 (P-1569 Std.)	EA	4	1,300.00	5,200.00
27	Catch Basin Type M-2, L = 13, 17 (P-1569 Mod.)	EA	21	2,800.00	58,800.00
28	Catch Basin Type M-2, L = 13, 10 (P-1569 Mod.)	EA	1	2,400.00	2,400.00
29	Concrete Sewer Manhole (MAG 420 & 422)	EA	2	2,000.00	4,000.00
30	Concrete Sidewalk (P-1230)	SF	5,690	2.00	11,380.00
31	Curb and gutter, Type "A", H = 6 In. (MAG 220)	FT	1,288	7.00	9,016.00
32	Large Diameter Plugs (MAG 427)	EA	3	800.00	2,400.00
33	Manhole Base (P-1560 & MAG 522)	EA	3	3,000.00	9,000.00
34	Storm Drain Manhole (P-1520 & MAG 522)	EA	5	1,800.00	9,000.00
35	Permanent Pavement Replacement	SY	5,666	12.00	67,992.00
36	Seal Coat	SY	3,131	0.25	783.00
37	Survey Marker, Type "B" (MAG 120-1)	EA	8	150.00	1,200.00
38	Survey Marker, Type "A" (MAG 120-1)	EA	1	250.00	250.00
39	Traffic and Access Control	LS	1	30,000.00	30,000.00
40	Water Line Relocate Cross Tie (Station 13+05)	LS	1	2,000.00	2,000.00

41	DIP Permanent Water Pipe (403-3)	EA	11	800.00	8,800.00
42	SS Optional Pipe Support (403-1, 2, 3)	EA	13	600.00	7,800.00
43	8 Inch DIP Water Replacement Pipe	FT	166	30.00	4,980.00
44	8 Inch DIP Sanitary Sewer Replacement Pipe	FT	180	40.00	7,200.00
45	Realign Ditch	FT	834	2.00	1,668.00
46	Concrete Curb (MAG 222-B)	FT	465	7.00	3,255.00
47	5 Ft. Curb Transition (MAG 221)	EA	2	40.00	80.00
48	Modify Existing Sanitary Sewer Manhole	EA	1	600.00	600.00
49	Valley Gutter Replacement	SF	10	8.00	80.00
50	Concrete Driveway Replacement	SF	280	3.00	840.00
51	8 Inch DIP Sanitary Sewer Relocation	LF	42	30.00	1,260.00
52	Miscellaneous Removal and Other Work	LS	1	5,000.00	5,000.00
53	Saw Cut AC and PCC	FT	331	1.50	497.00
54	Remove Concrete Curb and Gutter	FT	1,270	2.00	2,540.00
55	Remove Concrete Sidewalk, Driveway, Valley, Gutter and Apron	SF	6,350	1.00	6,350.00
56	Remove Pipe Backfill and Compact 30 in. and over	FT	10	12.00	120.00
57	Remove Asphalt Pavement	SY	3,131	1.75	5,480.00
58	Remove Headwall and Catch Basin, Backfill and Compact	EA	1	2,500.00	2,500.00
59	Remove Existing Manhole	EA	2	300.00	600.00
60	Remove Pipe, Backfill and Compact 24 in. and under	FT	25	10.00	250.00
61	Allowance for EXTRA Work	LS	1	50,000.00	50,000.00
				TOTAL	1,330,975.00



ENGINEER'S COST ESTIMATE

GROVER AVENUE STORM DRAIN LATERAL

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY (FCD #93-21)

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23	Catch Basin Type M-1, L = 6 (P-1569 Mod.)	EA	2	1,500.00	3,000.00
24	Catch Basin Type M-1, L = 10 (P-1569 Std.)	EA	2	1,600.00	3,200.00
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61	Allowance for EXTRA Work	LS	1	50,000.00	50,000.00
				TOTAL	1,330,975.00



LETTER OF TRANSMITTAL

**Morrison
Maierle /CSSA**

4621 North 16th Street
Suite D-401
Phoenix, AZ 85016
(602) 277-2828

Date 5-5-95	Job No. 8156.001
Attention John Bethel	
Re: Grovers Avenue	

TO: City of Phoenix
Street Transportation

GENTLEMEN:

We are sending you Attached Under Separate cover via FAX 495-3670 the following items:

- Shop Drawings Prints Plans Samples Specifications Copy of Letter Change Order

COPIES	DATE	NO.	DESCRIPTION
			<u>26th Street Modification</u>
			<u>31th Street Modification</u>

THESE ARE TRANSMITTED as checked below:

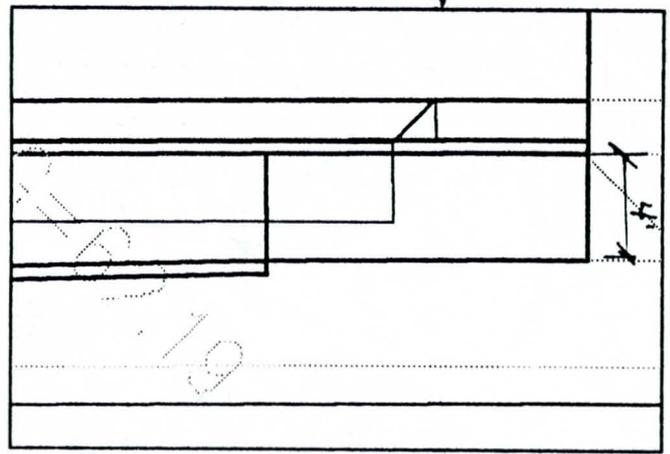
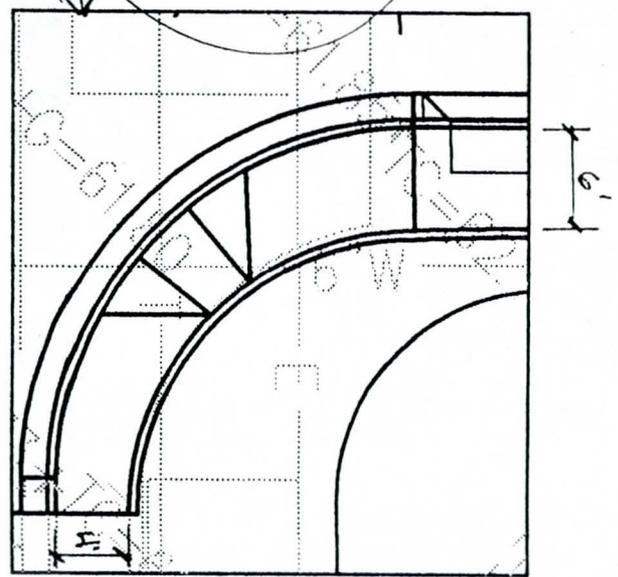
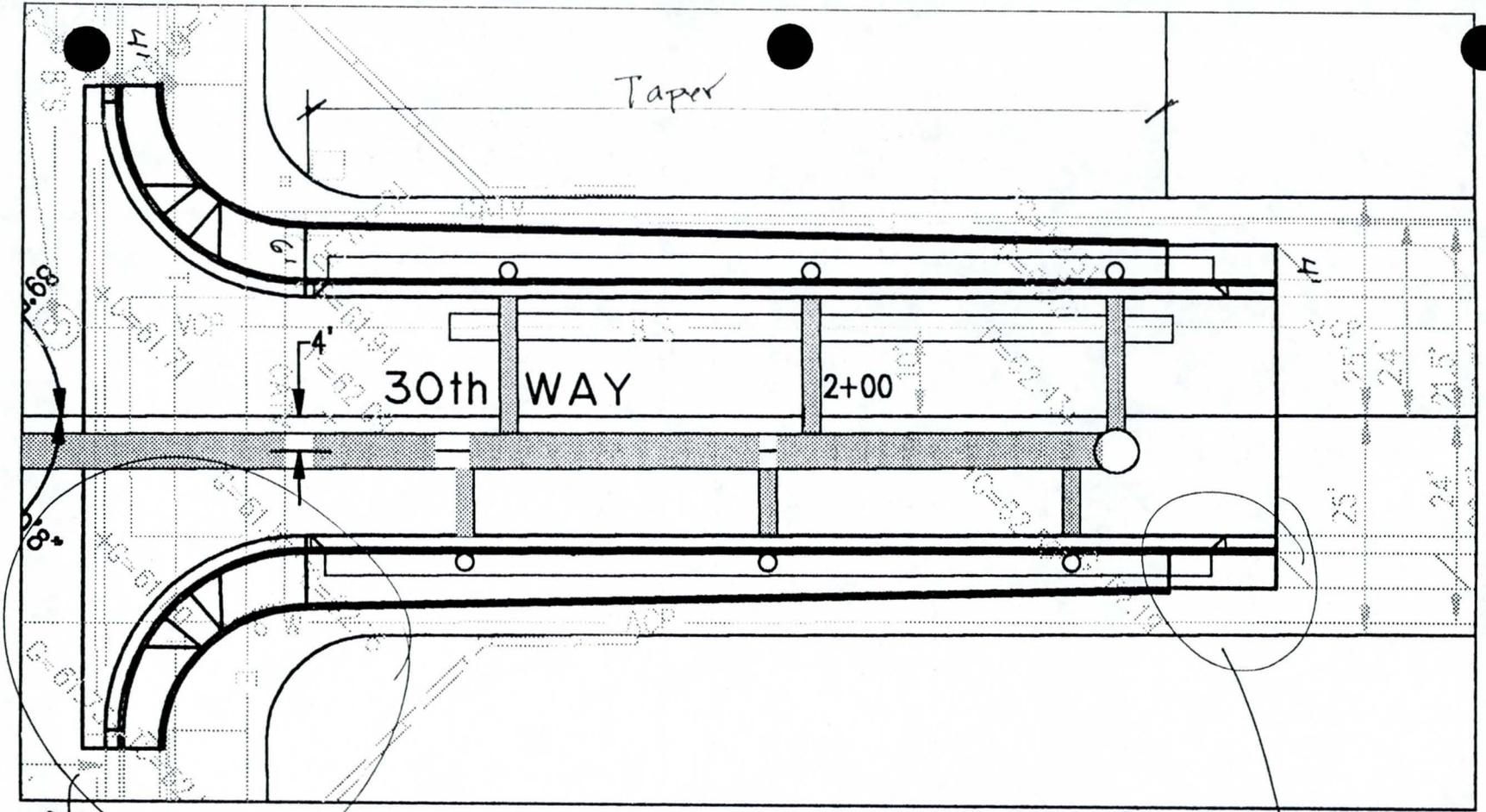
- | | | |
|--|--|---|
| <input checked="" type="checkbox"/> For approval | <input type="checkbox"/> Approved as noted | <input type="checkbox"/> Rejected |
| <input type="checkbox"/> For your use | <input type="checkbox"/> Returned for Correction | <input type="checkbox"/> Prints returned after loan to us |
| <input type="checkbox"/> As requested | <input type="checkbox"/> For review and comment | <input type="checkbox"/> For your files |
| <input type="checkbox"/> Approved as submitted | <input type="checkbox"/> Revised and resubmit | |

REMARKS: Here are the sketches that summarize the decisions at our field visit this week.

Please give me your comments.

Copy To: Mike Lopez Signed: Burt Friedrich

If enclosures are not as noted, please advise.



LETTER OF TRANSMITTAL

**Morrison
Maierle /CSSA**

4621 North 16th Street
Suite D-401
Phoenix, AZ 85016
(602) 277-2828

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TO: City of Phoenix
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			<u>30th Street Modification</u>

THESE ARE TRANSMITTED as checked below:

- | | | |
|--|--|---|
| <input checked="" type="checkbox"/> For approval | <input type="checkbox"/> Approved as noted | <input type="checkbox"/> Rejected |
| <input type="checkbox"/> For your use | <input type="checkbox"/> Returned for Correction | <input type="checkbox"/> Prints returned after loan to us |
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Maierle /CSSA**

4621 North 16th Street
Suite D-401
Phoenix, AZ 85016
(602) 277-2828

Date <i>1/26/95</i>	Job No. <i>8156.001</i>
Attention <i>JOHN BETHEL</i>	
Re: <i>GROVERS AVE.</i>	
<i>STORM DRAIN</i>	

TO: *CITY OF PHOENIX*

GENTLEMEN:

We are sending you Attached Under Separate cover via _____ the following items:

- Shop Drawings Prints Plans Samples Specifications Copy of Letter Change Order

COPIES	DATE	NO.	DESCRIPTION
<i>1</i>			<i>90% SPECS.</i>
<i>1</i>			<i>90% ENGINEERS ESTIMATE</i>

THESE ARE TRANSMITTED as checked below:

- | | | |
|--|--|---|
| <input type="checkbox"/> For approval | <input type="checkbox"/> Approved as noted | <input type="checkbox"/> Rejected |
| <input checked="" type="checkbox"/> For your use | <input type="checkbox"/> Returned for Correction | <input type="checkbox"/> Prints returned after loan to us |
| <input checked="" type="checkbox"/> As requested | <input checked="" type="checkbox"/> For review and comment | <input type="checkbox"/> For your files |
| <input type="checkbox"/> Approved as submitted | <input type="checkbox"/> Revised and resubmit | |

REMARKS:

MIKE LOPEZ ASKED US TO GET YOU ANOTHER SET OF SPECS AND ESTIMATE. PLEASE CALL ME IF YOU NEED ANYTHING ELSE.

Copy To: *file* Signed: *ALEX BATT*

If enclosures are not as noted, please advise.

LETTER OF TRANSMITTAL

**Morrison
Maierle /CSSA**

4621 North 16th Street
Suite D-401
Phoenix, AZ 85016
(602) 277-2828

Date <u>11-28-94</u>	Job No. <u>8156.001</u>
Attention <u>Mike Lopez</u>	
Re: <u>Grovers Avenue Storm</u>	
<u>Drain Lateral</u>	

TO: Mike Lopez
Mariappa County Flood Control District
2801 West Durango Street
Phoenix, Az 85009

GENTLEMEN:

We are sending you Attached Under Separate cover via _____ the following items:

- Shop Drawings Prints Plans Samples Specifications Copy of Letter Change Order

COPIES	DATE	NO.	DESCRIPTION
1	11/28		<u>Structural Design Computations</u>
			<u>Grovers Avenue</u>
			<u>Project No. 93-21</u>

THESE ARE TRANSMITTED as checked below:

- | | | |
|--|--|---|
| <input type="checkbox"/> For approval | <input type="checkbox"/> Approved as noted | <input type="checkbox"/> Rejected |
| <input type="checkbox"/> For your use | <input type="checkbox"/> Returned for Correction | <input type="checkbox"/> Prints returned after loan to us |
| <input checked="" type="checkbox"/> As requested | <input type="checkbox"/> For review and comment | <input type="checkbox"/> For your files |
| <input type="checkbox"/> Approved as submitted | <input type="checkbox"/> Revised and resubmit | |

REMARKS: _____

Copy To: file Signed: [Signature]

If enclosures are not as noted, please advise.

**Morrison
Maierle/CSSA**

since 1945

ENGINEERS
PLANNERS
SURVEYORSP.O. Box 6147
910 Helena Avenue
Helena, MT 59604
Phone: (406) 442-3050
FAX: (406) 442-7862

November 16, 1994

Ms. Dotty Klaahsen
Flood Control District of Maricopa County
Planning and Project Management Division
2801 West Durango Street
Phoenix, AZ 85009

Re: Contract FCD 93-21 Grovers Avenue Lateral
MBE/WBE Participation Report

VIA FAX

Dear Ms. Klaahsen:

Enclosed is the above referenced form covering the period from the beginning of the contract through our last bill. We will include this report with all future billing. A copy has been sent to the Minority Business Office.

Sincerely,

MORRISON-MAIERLE/CSSA, INC.

Laurence D. Bickell
Chief Accountant

LDB\sra

Enclosure

c: Minority Business Office
Bruce Friedhoff, P.E.

MARICOPA COUNTY
MINORITY/WOMEN-OWNED BUSINESS ENTERPRISES PROGRAM

MBE/WBE PARTICIPATION REPORT
(To be attached with Request for Pay)

Date: 11/16/94

Consultant: Morrison-Maierle/CSSA, Inc.
Contact Person: Bruce J. Friedhoff
Address: 4621 N. 16th Street, Suite D-401
Phoenix, AZ 85016

Telephone Number: (602) 277-2828
Fax Number: (602) 279-2554

Project Description: Grovers Ave.-
Contract Number: Storm Drain Lateral
FCD 93-21

For Pay Period of: 11/03/93 - 09/30/94 = thru invoice 94-8171 for
\$11,117.38
NONE MBE/WBE

Subcontractor:
Contact Person:
Address:
Telephone Number::

Type of Firm:
Class of Work Provided:

Subcontract Amount: \$ _____
Amount Earned this Pay Period: \$ _____
(Commission) this Pay Period: \$ _____
Total Earned by this Subcontractor: \$ _____

Total MBE/WBE Contract Goal = 00 % \$ NONE
Total Cumulative MBE/WBE Participation
on this Contract = 00 % \$ NONE

MBE/WBE subcontract payment made during this reporting period NO (yes or no)

cc: Minority Business Office
Maricopa County Highway Building
2801 West Durango Street
Phoenix, Arizona 85009

November 3, 1994

Mr. Mike Lopez, P.E.
Planning & Project Management Division
Flood Control District of Maricopa County
2801 West Durango
Phoenix, AZ 85009

RE: Grovers Avenue Storm Drain Lateral
Cave Creek Road to 32nd Street
FCD No. 93-21
MM/CSSA Job No. 8156.001
90% SUBMITTAL

Dear Mr. Lopez:

Transmitted herewith are the following documents for your review:

- Four (4) copies of Updated Design Calculations (incorporating 60% Comments and Revisions)
- Four (4) full-size and two (2) half size copies of Construction Plans
- Four (4) copies of Construction Specifications
- Four (4) copies of Cost Estimate
- Three (3) of 60% Plan Review Comments
- Two (2) Redlined Sets of Plans/Profiles 60% Review

Two (2) sets of plans are being sent directly to the city of Phoenix Water and Wastewater Department for their review, along with the 60% plan and profile review sets. The pothole information and revisions discussed during the Preliminary 90% Plan Review meeting at your office have been incorporated in this submittal.

Please transmit construction plans to all affected utilities for their review and approval and call me concerning any questions you may have.

Sincerely,

MORRISON-MAIERLE/CSSA, INC.


for Bruce J. Friedhoff, P.E.
Office Manager

BJF/cjs

November 3, 1994

Mr. Jerry Arakaki
City of Phoenix
Water and Wastewater Department
Planning and Engineering
200 West Washington
Phoenix, AZ 85003

RE: Grovers Avenue Storm Drain Lateral
Cave Creek Road to 32nd Street
FCD No. 93-21
MM/CSSA Job No. 8156.001
90% SUBMITTAL

Dear Mr. Arakaki

Transmitted herewith for your review and comment are the following documents:

- Two (2) full-size sets of Construction Plans
- Three (3) red-lined 60% Review Plans

Please call me concerning any questions you may have.

Sincerely,

MORRISON-MAIERLE/CSSA, INC.

for 
Bruce J. Friedhoff, P.E.
Office Manager

BJF/cjs

cc: Michael Lopez, FCDMC

ENGINEER'S COST ESTIMATE

Revised: 03-Nov-94

GROVER AVENUE STORM DRAIN LATERAL
 FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
 CD #93-21

ITEM NO.	DESCRIPTION	UNIT	QTY.	UNIT COST	COST
1	10x10x8 Ft. Junction Structure	EA	1	8,000.00	8,000.00
2	12x12x15 Ft. Junction Structure	EA	1	13,000.00	13,000.00
3	12x12x9 Ft. Junction Structure	EA	1	12,000.00	12,000.00
4	24 Inch Reinforced Concrete Connector Pipe	FT	691	60.00	41,460.00
5	36 Inch Reinforced Concrete Connector Pipe	FT	84	100.00	8,400.00
6	24 Inch Reinforced Concrete Pipe	FT	59	48.00	2,832.00
7	42 Inch Reinforced Concrete Pipe	FT	1,048	84.00	88,032.00
8	48 Inch Reinforced Concrete Pipe	FT	786	96.00	75,456.00
9	60 Inch Reinforced Concrete Pipe	FT	285	150.00	42,750.00
10	84 Inch Reinforced Concrete Pipe	FT	1,506	210.00	316,260.00
11	8 Ft. x 8 Ft. Concrete Box Conduit	FT	1,227	284.00	348,468.00
12	42 x 24 Inch Pre-Fab Tee	EA	3	400.00	1,200.00
13	48 x 24 Inch Pre-Fab Tee	EA	6	450.00	2,700.00
14	60 x 24 Inch Pre-Fab Tee	EA	6	500.00	3,000.00
15	60 x 36 Inch Pre-Fab Tee	EA	4	550.00	2,200.00
16	84 x 24 Inch Pre-Fab Tee	EA	9	700.00	6,300.00
17	8 Inch Vitrified Clay Pipe Sewer Relocation	FT	147	18.00	2,646.00
18	Adjust Valve Box & Cover (MAG 270)	EA	6	250.00	1,500.00
19	Pipe Collars, 24" & Larger	EA	17	650.00	11,050.00
20	Subgrade Preparation	SY	3,733	1.50	5,599.50
21	Grade to Drain	SY	1,200	2.00	2,400.00
22	Catch Basin, Type N, Single (P-1570)	EA	5	1,200.00	6,000.00
23	Catch Basin Type M-1, L = 6 (P-1569 Mod.)	EA	2	1,500.00	3,000.00
24	Catch Basin Type M-1, L = 10 (P-1569 Std.)	EA	2	16,000.00	32,000.00
25	Catch Basin Type M-1, L = 17 (P-1569 Std.)	EA	1	2,000.00	2,000.00
26	Catch Basin Type M-1, L = 6 (P-1569 Std.)	EA	4	1,300.00	5,200.00
27	Catch Basin Type M-2, L = 13, 17 (P-1569 Mod.)	EA	21	2,800.00	58,800.00
28	Catch Basin Type M-2, L = 13, 10 (P-1569 Mod.)	EA	1	2,400.00	2,400.00
29	Concrete Sewer Manhole (MAG 420 & 422)	EA	2	2,000.00	4,000.00
30	Concrete Sidewalk (P-1230)	SF	5,050	2.00	10,100.00
31	Curb and gutter, Type "A", H = 6 In. (MAG 220)	FT	1,288	7.00	9,016.00
32	Large Diameter Plugs (MAG 427)	EA	3	800.00	2,400.00
33	Manhole Base (P-1560 & MAG 522)	EA	3	3,000.00	9,000.00
34	Pavement Replacement	SY	3,131	12.00	37,572.00
35	Storm Drain Manhole (P-1520 & MAG 522)	EA	5	1,800.00	9,000.00
36	Survey	LS	1	30,000.00	30,000.00
37	Survey Marker, Type "B" (MAG 120-1)	EA	8	150.00	1,200.00
38	Survey Marker, Type "A" (MAG 120-1)	EA	1	250.00	250.00
39	Traffic and Access Control	LS	1	30,000.00	30,000.00
40	Uniformed Off-Duty Law Enforcement	HR	100	21.00	2,100.00
41	Water Line Relocate Cross Tie	EA	1	1,500.00	1,500.00
42	6 Inch DIP Alternate Pipe Support	EA	4	1,000.00	4,000.00
43	Pipe Support (MAG 403)	EA	28	600.00	16,800.00
44	8 Inch DIP Water Replacement	FT	166	30.00	4,980.00
45	8 Inch DIP Sanitary Sewer Replacement Support Pipe	FT	180	40.00	7,200.00
46	Realign Ditch	FT	344	2.00	688.00
47	Concrete Curb (MAG 222-B)	FT	904	7.00	6,328.00
48	5 Ft. Curb Transition (MAG 221)	EA	2	40.00	80.00
49	Reconstruct Existing Sanitary Sewer Manhole	EA	1	600.00	600.00
50	Valley Gutter Replacement	SF	10	8.00	80.00
51	8 Inch DIP Sanitary Sewer Relocation	LF	42	30.00	1,260.00
52	Waterline Cross-tie Relocation	LS	1	600.00	600.00
53	Allowance for EXTRA Work	LS	1	50,000.00	50,000.00
54	Allowance for Public Information and Notification	LS	1	5,000.00	5,000.00
55	Allowance for Quality Control & Testing	LS	1	50,000.00	50,000.00
				SUBTOTAL	1,398,407.50
				10% Contingency	139,840.75
				TOTAL	1,538,248.25

FLOOD CONTROL DISTRICT

of

Maricopa County

2801 West Durango Street • Phoenix, Arizona 85009

Telephone (602) 506-1501

Fax (602) 506-4601

TT (602) 506-5859

BOARD OF DIRECTORS

Betsy Bayless

John T. Katsenes

Ed King

Tom Rawles

Mary Rose Garrido Wilcox



Mr. Bruce Friedhoff, P.E.
Office Manager
Morrison Maierle/CSSA
4621 North 16th Street, Suite D-401
Phoenix, Arizona 85016

Re: Contract FCD 93-21, Grovers Avenue Lateral
Upper East Fork Cave Creek Design

Dear Mr. Friedhoff:

The Flood Control District has reviewed the plans of your 60% submittal dated June 20, 1994. Following are comments that we have listed. Along with this list of comments, blueline sets are enclosed with additional comments from the District and the City of Phoenix. A comment review meeting is scheduled for July 19 at 9:30 am at the District to discuss these comments with you. Please bring the marked-up bluelines with you to the meeting and return them with your next submittal. Final comments of the report and specifications are not complete at this time. I will forward them to you at a later date.

General Comments

1. Increase the text size of the construction notes and call outs on the plans; at half-size, the text is hard to read.
2. Reduce the number of existing grades shown on the plans; they tend to clutter the drawings. Leave enough elevations for the contractor to replace what might be lost during construction of the lateral, but don't place existing elevations on items that will not be effected.
3. Not enough labeling of all the line work on the plans. Call out edges of pavements, dirt ditches, etc. The centerline should be a thicker line so that it stands out.
4. References to other sheets should be placed on each plan sheet indicating where the connector pipe profile can be found, or paving sheet if it applies, or any other sheet that corresponds to a particular plan sheet.
5. Symbols used for the existing monuments or new monument on the plans are not the same as shown in the legend. Some abbreviations do not correspond with those used by the COP or MAG.

6. The construction notes for the catch basins and connector should show the complete description of the catch basin, P-1569-M -, L=?, the connection type, and the length of connector pipe. Use the full width of the area designated for construction notes.
7. Do not call out the elevations of the monuments that are to be disturbed by the project.
8. Add catch basins along the lateral to catch the 2-year flows at the COP's minimum spacing and at the end of the upstream returns facing Grovers. These catch basins do not have to be analyzed as part of the 100-year lateral hydraulics.
9. Preliminary details were supposed to be included with the 60% submittal.
10. Use the standard symbology for pipe in the plan views.
11. Remove the HGL from the Storm Drain Plan and Profile sheets.
12. Show the symbol for new concrete where new sidewalks are to be constructed. Use the COP's drafting standards.
13. The 6" & 8" waterline may be too close for the trench to meet OSHA requirements without shoring. A waterline relocation plan should be prepared. We can bid relocation of the waterline as an option to shoring the trench.

Engineering Comments

1. Many abbreviations were used that are not MAG standard abbreviations that do not appear in the legends either. There should be no periods between alphabets if an abbreviation is a MAG type, e.g. DIP instead of D.I.P for ductile iron pipe. Non-standard abbreviations may have periods, but these have to be listed in an abbreviation table.
2. The station numbers were not stated for some items in the construction notes.
3. MAG or COP standard detail numbers were not stated for several items to be constructed.
4. Sheet 5: Connector pipes for Catch Basin No's 27, 28, and 29 do not appear in the profile for the 8' x 8' CBC.
5. Sheet 7: Why is there a sump at the junction of the 8' x 8' CBC and 84" RCP?
6. Sheet 91: Remove construction note 7 which is a repetition of note 6.
7. Sheet 10: Why is there a sump at the junction of the 84" RCP and 48" RCP?
8. Sheet 15: Why is there a sump at the junction of the main storm drain lateral and 84" RCP?
9. Sheet 15: Eliminate the transition by moving the MH south and end the line with a plug. Move the catch basins on the west side of the road south with the others in a series.

Mr. Bruce Friedhoff, P.E.
Office Manager, Morrison Maierle/CSSA
Contract FCD 93-21, Grovers Avenue Lateral
Upper East Fork Cave Creek Design
Page 3

Utility Comments

1. Add the following information to the utility notification block and delete the headings for contact date and response date.

APS Electric, John Herrera - 371-6942
US West Communications, Curt Sayer - 395-2415
Southwest Gas Paul McLaughlin - 484-5649
Dimension Cable, Carl McKay - 352-5860

2. Sheet 5: Station 3+52: Plans show a water service at this station. It should also be shown in profile view.
3. Sheet 5: Construction note 14 for pipe support refers to a location where there is no crossing pipe in the plan view.
4. Sheet 6: Station 6+59 - The telephone line should also be shown in the profile view.
5. Sheet 10: Station 27+23 - Need a connector pipe profile to see if this conflicts with the 36" water, cable TV, or 2" gas.
6. Sheet 14: Revise the electric and telephone locations to reflect the pothole information from APS.
7. Sheet 14: Label the Cable TV on the north side of Grovers.
8. Sheet 15: Revise to reflect APS pothole data.
9. Sheet 18: Show the telephone lines in profile view between manholes 1 and 2.
10. Sheets 20, 21, and 22: Show the electrical conduits correctly from pothole data. There is approximately 6" clearance from the electrical ducts to the connector pipe. Please lower the connector pipe to provide a minimum 1' clearance.

Please be prepared to discuss these comments at the comment review meeting before proceeding further. The plans did not meet the Districts expectation of a 60% submittal. Instead of asking for a resubmittal of the 60% plans, the corrections should be made and the necessary information contained on the plans for the 90% submittal. If you have any questions, please call me at 506-8742.

Sincerely,


Michael A. Lopez, P.E.
Project Manager

MAL/lbw

July 22, 1994

Mr. Michael Lopez, P.E.
Project Manager
Flood Control District of Maricopa Count
2801 West Durango Street
Phoenix, Arizona 85009

RE: Contract FCD 93-21, Grovers Avenue Lateral
Upper East Fork Cave Creek Design
Pot Hole Locations
Job No. 8156.001

Dear Mike:

Transmitted herewith as we discussed at last Tuesday's meeting is one (1) set of red line storm drain plan profiles and a list of the potential utility conflicts for your use in obtaining "pot hole" data. The green line shown on the plans is the tentative location for the new water line.

Please call me concerning any questions you may have.

Sincerely,



Bruce J. Friedhoff, P.E.
Office Manager

Enclosures

GROVERS AVENUE STORM DRAIN POT-HOLE LOCATIONS

<u>STATION</u>	<u>LT. RT.</u>	<u>OBSTRUCTION</u>
2 + 35	21' LT.	4" WATER
12 + 75	2' RT.	TELCO
20 + 74	2' RT.	SEWER SVC.
21 + 92	2' RT.	SEWER SVC.
23 + 67	2' RT.	SEWER SVC.
24 + 78	2' RT.	6" WATER
25 + 25	2' RT.	SEWER SVC.
26 + 22	2' RT.	TELCO
34 + 65	4' RT.	SEWER SVC.
36 + 23	4' RT.	SEWER SVC.
36 + 84	4' RT.	SEWER SVC.
38 + 44	4' RT.	8" SEWER V.C.P.

26TH STREET S.D. P-H LOCATIONS

1 + 17	4' RT.	8" SEWER
1 + 30	4' RT.	CATV
1 + 42	4' RT.	ELEC.
1 + 45	4' RT.	TELCO
1 + 63	13.5' LT.	8" SEWER
1 + 97	13.5' LT.	8" SEWER
2 + 30	13.5' LT.	8" SEWER

28TH STREET S.D. P-H LOCATIONS

1 + 16	6' RT.	8" SEWER
1 + 21	6' RT.	TELCO
1 + 74	6' LT.	8" WATER
2 + 07	6' LT.	8" WATER
2 + 40	6' LT.	8" WATER
3 + 75	6' LT.	8" WATER
4 + 08	6' LT.	8" WATER

29TH STREET S.D. P-H LOCATIONS

1 + 06	4' LT.	8" WATER
1 + 16	4' LT.	8" SEWER
1 + 34	4' LT.	ELEC.
1 + 36	4' LT.	ELEC.
1 + 55	8' RT.	8" SEWER
1 + 55	12' RT.	CATV
1 + 55	16' RT.	6" WATER

30TH WAY S.D. P-H LOCATIONS

<u>STATION</u>	<u>LT. RT.</u>	<u>OBSTRUCTION</u>
1 + 06	4' RT.	8" WATER
1 + 29	4' RT.	CATV
1 + 38	4' RT.	ELEC.
1 + 61	10' LT.	8" SEWER
1 + 94	10' LT.	8" SEWER
2 + 27	10' LT.	8" SEWER

GROVERS AVENUE NEW SEWER P-H LOCATIONS

1 + 58	0' RT.	WATER
2 + 02	21' LT.	TELCO
2 + 02	45' LT.	TELCO

GROVERS AVENUE NEW WATER P-H LOCATION

12 + 75	10' LT.	TELCO
---------	---------	-------

July 22, 1994

Mr. Michael Lopez, P.E.
Project Manager
Flood Control District of Maricopa Count
2801 West Durango Street
Phoenix, Arizona 85009

RE: Contract FCD 93-21, Grovers Avenue Lateral
Upper East Fork Cave Creek Design
Pot Hole Locations
Job No. 8156.001

Dear Mike:

Transmitted herewith as we discussed at last Tuesday's meeting is one (1) set of red line storm drain plan profiles and a list of the potential utility conflicts for your use in obtaining "pot hole" data. The green line shown on the plans is the tentative location for the new water line.

Please call me concerning any questions you may have.

Sincerely,



Bruce J. Friedhoff, P.E.
Office Manager

Enclosures

GROVERS AVENUE STORM DRAIN POT-HOLE LOCATIONS

<u>STATION</u>	<u>LT. RT.</u>	<u>OBSTRUCTION</u>
2 + 35	21' LT.	4" WATER
12 + 75	2' RT.	TELCO
20 + 74	2' RT.	SEWER SVC.
21 + 92	2' RT.	SEWER SVC.
23 + 67	2' RT.	SEWER SVC.
24 + 78	2' RT.	6" WATER
25 + 25	2' RT.	SEWER SVC.
26 + 22	2' RT.	TELCO
34 + 65	4' RT.	SEWER SVC.
36 + 23	4' RT.	SEWER SVC.
36 + 84	4' RT.	SEWER SVC.
38 + 44	4' RT.	8" SEWER V.C.P.

26TH STREET S.D. P-H LOCATIONS

1 + 17	4' RT.	8" SEWER
1 + 30	4' RT.	CATV
1 + 42	4' RT.	ELEC.
1 + 45	4' RT.	TELCO
1 + 63	13.5' LT.	8" SEWER
1 + 97	13.5' LT.	8" SEWER
2 + 30	13.5' LT.	8" SEWER

28TH STREET S.D. P-H LOCATIONS

1 + 16	6' RT.	8" SEWER
1 + 21	6' RT.	TELCO
1 + 74	6' LT.	8" WATER
2 + 07	6' LT.	8" WATER
2 + 40	6' LT.	8" WATER
3 + 75	6' LT.	8" WATER
4 + 08	6' LT.	8" WATER

29TH STREET S.D. P-H LOCATIONS

1 + 06	4' LT.	8" WATER
1 + 16	4' LT.	8" SEWER
1 + 34	4' LT.	ELEC.
1 + 36	4' LT.	ELEC.
1 + 55	8' RT.	8" SEWER
1 + 55	12' RT.	CATV
1 + 55	16' RT.	6" WATER

30TH WAY S.D. P-H LOCATIONS

<u>STATION</u>	<u>LT. RT.</u>	<u>OBSTRUCTION</u>
1 + 06	4' RT.	8" WATER
1 + 29	4' RT.	CATV
1 + 38	4' RT.	ELEC.
1 + 61	10' LT.	8" SEWER
1 + 94	10' LT.	8" SEWER
2 + 27	10' LT.	8" SEWER

GROVERS AVENUE NEW SEWER P-H LOCATIONS

1 + 58	0' RT.	WATER
2 + 02	21' LT.	TELCO
2 + 02	45' LT.	TELCO

GROVERS AVENUE NEW WATER P-H LOCATION

12 + 75	10' LT.	TELCO
---------	---------	-------

July 22, 1994

Mr. Michael Lopez, P.E.
Project Manager
Flood Control District of Maricopa Count
2801 West Durango Street
Phoenix, Arizona 85009

RE: Contract FCD 93-21, Grovers Avenue Lateral
Upper East Fork Cave Creek Design
Proposal for Change Order No. 2
Job No. 8156.001

Dear Mike:

We have reviewed the 60% Review comments and have found three items that are not included in our present scope of work.

Vista Verde Middle School Retention Basin

Provide a storm drain connection to the existing dry well at 28th Street and Grovers Avenue and abandon the dry well. The work will entail revisions to the plan/profile sheet; a detail showing the special connection to the dry well, and revisions to the right-of-way plans. This work is outside of the existing right-of-way on private property and was therefore not included in our original proposal.

Grovers Avenue Water Line

Provide water plans for bid alternative showing a new water line and service connections from 24th Street to 27th Street along Grovers Avenue. The bid alternative may result in a lower bid price. The new line will replace the existing 6 inch water line through that section of roadway. The work will entail design of approximately 1,800 lf of 8 inch water line, 3 water line connections, fire hydrant re-connections, 20 service connections and alignment determination. To perform the design, additional coordination with COP Water Services Department will be required. The design will consist of 2 plan sheets (2 plan views per sheet), 1 detail sheet, modifications to the storm drain plan/profile sheets, quantities and specifications. Because the storm drain can be constructed without this new water line, we did not include it in our contract proposal.

Grovers Avenue Catch Basins for 2-Year Storm

Provide catch basins along Grovers Avenue sized to intercept the 2-year storm water runoff. The work will add approximately 4 catch basins along the north and south gutter of Grovers Avenue between Cave Creek Highway and 30th Way. Design will consist of revisions to the storm drain plan/profile sheets, 4 connector pipe profile sheets, and quantities. Our original proposal was for intercepting the 100-Year runoff north of Grovers Avenue. Because the City of Phoenix does not typically install storm drain inlets in residential collector streets we did not include this work in our fee proposal.

Change Order

With your approval we will perform the additional services described above for the lump sum fee of \$6,405.07. A detailed cost proposal is attached for your use. This would result in the following contract modifications:

Initial Contract Amount	\$63,046.00
Previously Authorized Change Orders	\$9,456.90
Amount of Change Order No. 2	\$6,405.07
 Total New Contract Amount	 \$78,907.97

Please call me concerning any questions you may have.

Sincerely,



Bruce J. Friedhoff, P.E.
Office Manager

Enclosures

Grovers Avenue Storm Drain Lateral

Vista Verde Middle School Retention Basin

Direct Labor

Classification	Person	Hours	Rates	Labor Cost
Manager	Friedhoff	1	\$26.44	\$26.44
Engineer	Batt	0	\$23.80	\$0.00
Hydrologist	Mulvey	1	\$18.83	\$18.83
Survey Crew	Spring	2	\$25.00	\$50.00
Technician	Mc Kenzie	6	\$18.28	\$109.68
Clerical	Silvermale	1	\$10.23	\$10.23
Totals		11		\$215.18
Overhead			139%	\$299.10
Subtotal				\$514.28

Direct and Outside Expenses

	Sht/set	Sets	Sheets	Rate	Cost
CADD Vellum Plots	0	2	0	\$9.50	\$0.00
Full Size Prints	0	12	0	\$9.50	\$0.00
Half Size Prints	0	4	0	\$9.50	\$0.00
Subtotal					\$0.00
Total Item Cost					\$514.28

Grovers Avenue Water Line

Direct Labor

Classification	Person	Hours	Rates	Labor Cost
Manager	Friedhoff	4	\$26.44	\$105.76
Engineer	Batt	40	\$23.80	\$952.00
Hydrologist	Mulvey	0	\$18.83	\$0.00
Survey Crew	Spring	0	\$25.00	\$0.00
Technician	Mc Kenzie	20	\$18.28	\$365.60
Clerical	Silvermale	1	\$10.23	\$10.23
Totals		65		\$1,433.59
Overhead			139%	\$1,992.69
Subtotal				\$3,426.28

Direct and Outside Expenses

	Sht/set	Sets	Sheets	Rate	Cost
--	---------	------	--------	------	------

Groves Avenue Storm Drain Lateral

CADD Vellum Plots	3	2	6	\$9.50	\$57.00
Full Size Prints	3	12	36	\$9.50	\$342.00
Half Size Prints	3	4	12	\$9.50	\$114.00

Subtotal \$513.00

Total Item Cost \$3,939.28

Groves Avenue Catch Basins for 2-Year Storm

Direct Labor

Classification	Person	Hours	Rates	Labor Cost
Manager	Friedhoff	2	\$26.44	\$52.88
Engineer	Batt	15	\$23.80	\$357.00
Hydrologist	Mulvey	1	\$18.83	\$18.83
Survey Crew	Spring	0	\$25.00	\$0.00
Technician	Mc Kenzie	5	\$18.28	\$91.40
Clerical	Silvermale	1	\$10.23	\$10.23

Totals 24 \$530.34

Overhead 139% \$737.17

Subtotal \$1,267.51

Direct and Outside Expenses

	Sht/set	Sets	Sheets	Rate	Cost
CADD Vellum Plots	4	2	8	\$9.50	\$76.00
Full Size Prints	4	12	48	\$9.50	\$456.00
Half Size Prints	4	4	16	\$9.50	\$152.00

Subtotal \$684.00

Total Item Cost \$1,951.51

Grand Total Change Order No. 2 \$6,405.07



City of Phoenix

July 6, 1994

Mr. Bruce J. Friedhoff, P.E.
Morrison-Maierle/CSSA, Inc.
4621 North 16th Street, Suite D-401
Phoenix, Arizona 85016

Re: Grovers Avenue Storm Drain Lateral - Cave Creek Road to 30th Way

Dear Mr. Friedhoff:

We have reviewed the 60% plans for the proposed storm drain lateral in Grovers Avenue. Our comments are listed on the enclosed sheet and noted on the set of redlined plans.

Please note that sheets 23 through 26 were not included in the submittal.

If you have any questions regarding our comments, please contact me at 261-8229.

Sincerely,

Gerald K. Arakaki, P.E.
Civil Engineer III

GKA/db

Enclosures

c: Mike Lopez(FCDMC)
E.A.S. Central Files

GROVERS AVENUE STORM DRAIN LATERAL
REVIEW COMMENTS

Sheet

Comments

- | | |
|----|---|
| 5 | Sta. 1+70 - The existing 6" water line crossing the storm drain trench can be abandoned. Cut & plug the water line at the existing valve.
Sta. 2+35 - Replace the existing water line with DIP rather than installing a pipe support.
Sta. 3+51 - The existing water service is not shown in the profile. |
| 6 | Sta. 6+30 - The water line shown in the profile was not found in our records. |
| 7 | Sta. 9+30 - The water line shown in the profile was not found in our records. |
| 10 | Sta. 26+60 - The existing 8" water line is DIP and does not have to be replaced. |
| 14 | Sta. 1+63, Sta. 1+96, and Sta. 2+29 - The new catch basin connector pipes cross over the existing 8" sewer. Pipe supports will not be required for the sewer pipe. |
| 18 | Sta. 0+55 - Add a note to reshape the invert of the existing manhole to provide a smooth flow from the new connection.
Sta. 1+57 - The existing water line is DIP and does not have to be replaced. Provide a dimension from the new manhole in 24th Place to the existing manhole upstream. |

June 24, 1994

Mr. Gerald K. Arakaki, P.E.
Civil Engineer III
Water Services Department
City of Phoenix
200 West Washington Street
Phoenix, Arizona 85003-1697

RE: Grovers Avenue Storm Drain Lateral
Cave Creek Road to 32nd Street
60% Submittal
FCD #93-21
Job No. 8156.001

Dear Mr. Arakaki:

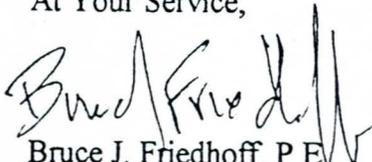
Transmitted herewith for your review and comment are the following documents:

1 Full Size and 1 Half Size copy of Construction Plans

Your 30% review comments were sent to Mike Lopez for information and he will be forwarding them to you when he is finished. Structure details, connector pipe profiles, and quantities will be completed and submitted with the 90% Submittal.

Please call me concerning any questions you may have.

At Your Service,


Bruce J. Friedhoff, P.E.
Office Manager

Copy: Mr. Mike Lopez, FCD

June 22, 1994

Mr. Mike Lopez, P.E.
Planning Engineer
Planning & Project Management Division
Flood Control District of Maricopa County
2801 West Durango
Phoenix, Arizona 85009

RE: Grovers Avenue Storm Drain Lateral
Cave Creek Road to 32nd Street
60% Submittal
FCD #93-21
Job No. 8156.001

Dear Mr. Lopez:

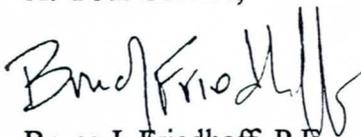
Transmitted under separate cover for your review and comment are the following documents:

- 6 Copies of the Design Report and Calculations
- 4 Full Size and 2 Half Size copies of Construction Plans
- 4 Copies of Construction Specifications
- 4 Copies of the Cost Estimate
- 3 Sets of 30% Plan Review Comments
- 1 Copy of 30% Design Report Comments

Two sets of plans are being sent directly to the City of Phoenix Water and Waste Water Department for their review. Structure details, connector pipe profiles, and quantities will be completed and submitted with the 90% Submittal. The increase in construction cost from \$1.4 to \$1.6 million is due to the change in inlet design requested in the 30% Submittal comments (ie. the grated inlets would be too noisy in a residential area).

Please transmit construction plans to all affected utilities for their review and approval and call me concerning any questions you may have.

At Your Service,



Bruce J. Friedhoff, P.E.
Office Manager

Grovers Avenue Storm Drain Lateral

Preliminary Construction Cost Estimate

No.	Description	Unit	Quantity	Unit Cost	Cost
1	Junction Structure	ea	3	\$12,000	\$36,000
2	24 Inch Reinforced Concrete Connector Pipe	feet	102	\$60	\$6,120
3	36 Inch Reinforced Concrete Connector Pipe	feet	360	\$100	\$36,000
4	24 Inch Reinforced Concrete Pipe	feet	59	\$48	\$2,832
5	42 Inch Reinforced Concrete Pipe	feet	1,175	\$84	\$98,700
6	48 Inch Reinforced Concrete Pipe	feet	647	\$96	\$62,112
7	60 Inch Reinforced Concrete Pipe	feet	289	\$150	\$43,350
8	84 Inch Reinforced Concrete Pipe	feet	1,512	\$210	\$317,520
9	8' x 8' Concrete Box Conduit	feet	1,227	\$284	\$349,013
10	60x36 Inch Pre-Fab Tee	ea	10	\$550	\$5,500
11	84x36 Inch Pre-Fab Tee	ea	6	\$750	\$4,500
12	18" Spur Connection to 8'x8' CBC	ea	2	\$700	\$1,400
13	8 Inch Vitrified Clay Pipe Sewer Relocation	feet	189	\$18	\$3,402
14	Adjust Man Hole Frame & Cover (MAG-270)	ea	7	\$250	\$1,750
15	Adjust Valve Box & Cover (MAG-270)	ea	2	\$250	\$500
16	Allowance for EXTRA Work	Job	1	\$50,000	\$50,000
17	Allowance for Quality Control & Testing	Job	1	\$50,000	\$50,000
18	Catch Basin & Apron, Type N, Single (P-1570)	ea	1	\$1,200	\$1,200
19	Catch Basin Type M-1, L = 6 (P-1569)	ea	2	\$1,500	\$3,000
20	Catch Basin Type M-1, L = 10 (P-1569)	ea	1	\$1,800	\$1,800
21	Catch Basin Type M-1, L = 17 (P-1569)	ea	2	\$2,225	\$4,450
22	Catch Basin Type M-2, L = 13,17 (P-1569 Mod.)	ea	22	\$2,800	\$61,600
23	Channel Excavation	cu yd	620	\$3.00	\$1,860
24	Concrete Sewer Manhole (MAG-420 & 422)	ea	2	\$2,000	\$4,000
25	Concrete Sidewalk (P-1230)	sq ft	4,695	\$2.00	\$9,390
26	Concrete Valley Gutter & Apron	sq ft	460	\$4.00	\$1,840
27	Curb and Gutter, Type 'A', H=6" (MAG-220)	feet	1,292	\$7.00	\$9,044
28	Large Diameter Plugs (MAG-427)	ea	2	\$1,000	\$2,000
29	Storm Drain Manhole (MAG-522)	ea	4	\$1,500	\$6,000
30	Storm Drain Manhole & Base (MAG-521 & 522)	ea	4	\$1,500	\$6,000
31	SD MH & Trans Base (MAG-520,522 & P-1520)	ea	3	\$1,500	\$4,500
32	Storm Drain Manhole & Base (MAG-520 & 522)	ea	4	\$1,500	\$6,000
33	Pavement Replacement, C-3/4 x 2" Thick	sq yd	1,474	\$15.00	\$22,104
34	Permanent Pipe Support (MAG-403-1&2)	ea	37	\$1,500	\$55,500
35	Pipe Collar (MAG-505)	ea	44	\$350	\$15,400
36	Survey	Job	1	\$30,000	\$30,000
37	Survey Marker, Type 'B' (MAG-120-1)	ea	8	\$150	\$1,200
38	Traffic and Access Control	job	1	\$30,000	\$30,000
39	Uniformed Off-Duty Law Enforcement	hour	100	\$21	\$2,100
40	Water Line Realignment	ea	2	\$2,200	\$4,400
	Subtotal				\$1,352,087
	Contingencies	job	20%		\$270,420
	Engineer's Opinion of Construction Cost				\$1,622,507

Grovers Avenue Storm Drain Lateral

Preliminary Construction Cost Estimate

No.	Description	Unit	Quantity	Unit Cost	Cost
1	Junction Structure	ea	3	\$12,000	\$36,000
2	24 Inch Reinforced Concrete Connector Pipe	feet	102	\$60	\$6,120
3	36 Inch Reinforced Concrete Connector Pipe	feet	360	\$100	\$36,000
4	24 Inch Reinforced Concrete Pipe	feet	59	\$48	\$2,832
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9	8' x 8' Concrete Box Conduit	feet	1,227	\$284	\$349,013
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11	84x36 Inch Pre-Fab Tee	ea	6	\$750	\$4,500
12	18" Spur Connection to 8'x8' CBC	ea	2	\$700	\$1,400
13	8 Inch Vitrified Clay Pipe Sewer Relocation	feet	189	\$18	\$3,402
14	Adjust Man Hole Frame & Cover (MAG-270)	ea	7	\$250	\$1,750
15	Adjust Valve Box & Cover (MAG-270)	ea	2	\$250	\$500
16	Allowance for EXTRA Work	Job	1	\$50,000	\$50,000
17	Allowance for Quality Control & Testing	Job	1	\$50,000	\$50,000
18	Catch Basin & Apron, Type N, Single (P-1570)	ea	1	\$1,200	\$1,200
19	Catch Basin Type M-1, L = 6 (P-1569)	ea	2	\$1,500	\$3,000
20	Catch Basin Type M-1, L = 10 (P-1569)	ea	1	\$1,800	\$1,800
21	Catch Basin Type M-1, L = 17 (P-1569)	ea	2	\$2,225	\$4,450
22	Catch Basin Type M-2, L = 13,17 (P-1569 Mod.)	ea	22	\$2,800	\$61,600
23	Channel Excavation	cu yd	620	\$3.00	\$1,860
24	Concrete Sewer Manhole (MAG-420 & 422)	ea	2	\$2,000	\$4,000
25	Concrete Sidewalk (P-1230)	sq ft	4,695	\$2.00	\$9,390
26	Concrete Valley Gutter & Apron	sq ft	460	\$4.00	\$1,840
27	Curb and Gutter, Type 'A', H=6" (MAG-220)	feet	1,292	\$7.00	\$9,044
28	Large Diameter Plugs (MAG-427)	ea	2	\$1,000	\$2,000
29	Storm Drain Manhole (MAG-522)	ea	4	\$1,500	\$6,000
30	Storm Drain Manhole & Base (MAG-521 & 522)	ea	4	\$1,500	\$6,000
31	SD MH & Trans Base (MAG-520,522 & P-1520)	ea	3	\$1,500	\$4,500
32	Storm Drain Manhole & Base (MAG-520 & 522)	ea	4	\$1,500	\$6,000
33	Pavement Replacement, C-3/4 x 2" Thick	sq yd	1,474	\$15.00	\$22,104
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37	Survey Marker, Type 'B' (MAG-120-1)	ea	8	\$150	\$1,200
38	Traffic and Access Control	job	1	\$30,000	\$30,000
39	Uniformed Off-Duty Law Enforcement	hour	100	\$21	\$2,100
40	Water Line Realignment	ea	2	\$2,200	\$4,400
	Subtotal				\$1,352,087
	Contingencies	job	20%		\$270,420
	Engineer's Opinion of Construction Cost				\$1,622,507

Grovers Avenue Storm Drain Lateral

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19	Catch Basin Type M-1, L = 6 (P-1569)	ea	2	\$1,500	\$3,000
20	Catch Basin Type M-1, L = 10 (P-1569)	ea	1	\$1,800	\$1,800
21	Catch Basin Type M-1, L = 17 (P-1569)	ea	2	\$2,225	\$4,450
22	Catch Basin Type M-2, L = 13,17 (P-1569 Mod.)	ea	22	\$2,800	\$61,600
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29	Storm Drain Manhole (MAG-522)	ea	4	\$1,500	\$6,000
30	Storm Drain Manhole & Base (MAG-521 & 522)	ea	4	\$1,500	\$6,000
31	SD MH & Trans Base (MAG-520,522 & P-1520)	ea	3	\$1,500	\$4,500
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39	Uniformed Off-Duty Law Enforcement	hour	100	\$21	\$2,100
40	Water Line Realignment	ea	2	\$2,200	\$4,400
	Subtotal				\$1,352,087
	Contingencies	job	20%		\$270,420
	Engineer's Opinion of Construction Cost				\$1,622,507

June 20, 1994

Mr. Mike Lopez, P.E.
Planning Engineer
Planning & Project Management Division
Flood Control District of Maricopa County
2801 West Durango
Phoenix, AZ 85009

RE: Grovers Avenue Storm Drain Lateral

Dear Mr. Lopez:

We have reviewed the *Report On Geotechnical Investigation* for the above-referenced project (Speedie Project No. 930314SA), dated January 18, 1994. The report generally meets the project requirements, however, we request that additional information be provided regarding the following items:

A) Soil Boring CAD File (Geotech. Reqmt. #2)

Please provide a legend explaining abbreviations used in the soil boring descriptions. Explanations for abbreviations designating sample type, ASTM/USCS typical descriptions, etc., are requested. In addition, we request that all test results be indicated on the soil boring descriptions. Presently the results of sieve analyses, liquid limit, plasticity limit, and plasticity index are not shown with the corresponding sample on the descriptive log. Tabulated results by sample number may be shown if this is more convenient. Please also explicitly indicate the presence or absence of ground water in each boring.

B) Conduit Durability/Constructability (Geotech. Reqmt. #3)

Please elaborate on the recommendations for durability and constructability of the CMP and CIP conduit options as these relate to the site-specific soil characteristics.

C) Trench Wall Stability/Shoring Requirements (Geotech Reqmt. #4)

Please provide site-specific recommendations for trench dimension restrictions, wall-slope restrictions, and shoring requirements referencing specific applicable guidance (e.g. OSHA, NIOSH). Copies of our 60% Design Submittal can be provided at your request.

D) Trench Backfill (Geotech Reqmt. #5)

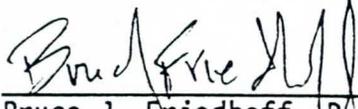
Please provide site-specific backfill and compaction requirements for the conduit options under consideration, taking into account the existing utility configuration. Existing utilities and proposed modifications are identified in our 60% Design Submittal, which can be provided at your request.

June 20, 1994
Mr. Lopez
Page 2

Please do not hesitate to contact the undersigned should you have any questions concerning these requests or require additional materials to assist you. We appreciate your cooperation and assistance in providing this important information.

Sincerely,

MORRISON-MAIERLE/CSSA



Bruce J. Friedhoff, P.E.
Project Manager

June 13, 1994

Mr. Mike Lopez, P.E.
Planning Engineer
Planning & Project Management Division
Flood Control District of Maricopa County
2801 West Durango
Phoenix, Arizona 85009

RE: Grovers Avenue Storm Drain Lateral
Cave Creek Road to 32nd Street
FCD #93-21
Job No. 8156.001

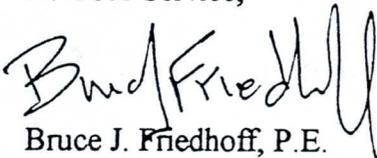
Dear Mr. Lopez:

Last week we received review comments from Mr. Gerald Arakaki, COP, asking that we perform a geotechnical analysis of the trench wall stability for the proposed Grovers Avenue Storm Drain.

We concur and request that Speedy and Associates, Inc. provide recommendations for trench wall stability and shoring requirements for the proposed typical sections to be shown in the 60% Submittal Plans.

Please call me concerning any questions you may have.

At Your Service,



Bruce J. Friedhoff, P.E.
Office Manager

June 8, 1994

Mr. Gerald K. Arakaki, P.E.
Civil Engineer III
Water Services Department
City of Phoenix
200 West Washington Street
Phoenix, Arizona 85003-1697

RE: Grovers Avenue Storm Drain Lateral
Cave Creek Road to 32nd Street
FCD #93-21
Job No. 8156.001

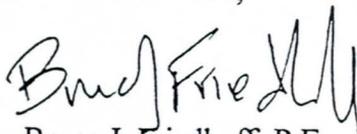
Dear Mr. Arakaki:

We have received your June 6, 1994 letter commenting on the 30% Plan Submittal for the above referenced project and offer the following response:

1. We will request that the FCD perform a geotechnical analysis as you requested. We have contacted the contractor who installed the 36-inch water line who said that there should not be a problem if a trench box is used for construction. This is also an OSHA requirement.
- 2 -4. Will comply.
5. The required Right-of-Way has been identified and it is my understanding that the FCD has started the acquisition process. Contact Mike Lopez at the FCD for more information.

If you require further information prior to the 60% Plan Submittal on June 20, 1994, please call me.

At Your Service,



Bruce J. Friedhoff, P.E.
Office Manager

Copy: Mr. Mike Lopez, FCD

May 18, 1994

Mr. Mike Lopez, P.E.
Planning Engineer
Planning & Project Management Division
Flood Control District of Maricopa County
2801 West Durango
Phoenix, AZ 85009

RE: Grovers Avenue Storm Drain Lateral
Project No. 93-21
MM/CSSA No. 8156.001

Dear Mr. Lopez:

We have reviewed the 30% submittal comments from the City of Phoenix and offer the following for your consideration:

1. The City suggests that the storm drain be located on the north side of the street to avoid the existing 36 inch water line. This would require relocating the existing 6 or 8 inch water line throughout the project.

We have prepared typical sections of the proposed location and transmitted them to three contractors who typically perform this type of work and asked them for their recommendations. All three said that the work could be done without relocating the water line. They did however suggest moving the storm drain from 1-2 feet north. Following this recommendation would locate the center of the storm drain line 2 feet south of the monument line. Memos and typical sections are attached.

2. The City prefers to use 108" RCP in place of the 8' x 8' concrete box conduit. We checked prices with Hydroconduit and the cost of installation with the previously mentioned contractors. We believe that the 8' x 8' CBC will be the least costly.
3. The City asked that we use pre-fabricated "Y" fittings and a curved pipe alignment for the lateral connections. While we agree that the arrangement would be hydraulically more efficient, we believe that the construction would be more expensive and would require additional utility relocations.

Based on the city's comments and the new information received from contractors, we propose to locate the 8' x 8' CBC 2 feet of the monument line and specify the following:

1. Maximum length of open trench shall be 500 feet.
2. Contractor shall use a trench box and shall protect all existing water lines.

3. Contractor shall use a cement enriched ABC slurry bedding to 1 foot above the top of the box or pipe conduit.
4. Locate the 28th street storm drain 6 feet right of the monument line.

If the city requires new water lines throughout the project we believe that we have a major change in the scope of work that would exceed the project budget.

Please call me concerning any questions you may have.

Sincerely,

MORRISON-MAIERLE/CSSA, INC.



Bruce J. Friedhoff
Office Manager, P.E.

BJF/jrh

Enclosures

TELEPHONE RECORD

DATE 5/17/94

TIME OF CALL 11:00

PROJECT NO. 8156.001 TEL NO. () 272-7885

PROJECT Grover's Avenue

CALL TO FROM Mike Hook @ HydroConduit

SUBJECT Cost of pipes furnished to site:

108" RCP @ \$ 175/LF

8'x8' CBC @ \$ 200/LF

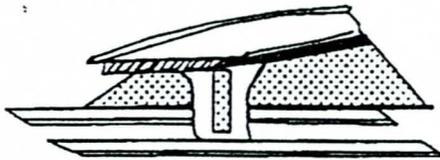
Will furnish costs for pre-fab "Y" & "Cross"
"Y" - 84x84 "Y" - 8'x8' & 84x36" Cross

ACTION REQUIRED OR TAKEN _____

NAME [Signature] FILE _____



SundtCorp



2604 S 20th Place
Phoenix, Arizona 83034
(602) 253-2972
Fax 253-7266

Heavy Construction Group - Phoenix Office

Facsimile Transmittal

DATE: 5/12/94
TO: JIM MCKENZIE
COMPANY: _____
FAX: 279-2554
FROM: BILL KELTON
SUBJECT: EXCAVATION WIDTHS

NUMBER OF PAGES TO FOLLOW (Including Cover Sheet): 2

We are sending from FAX NUMBER: (602) 253-7266

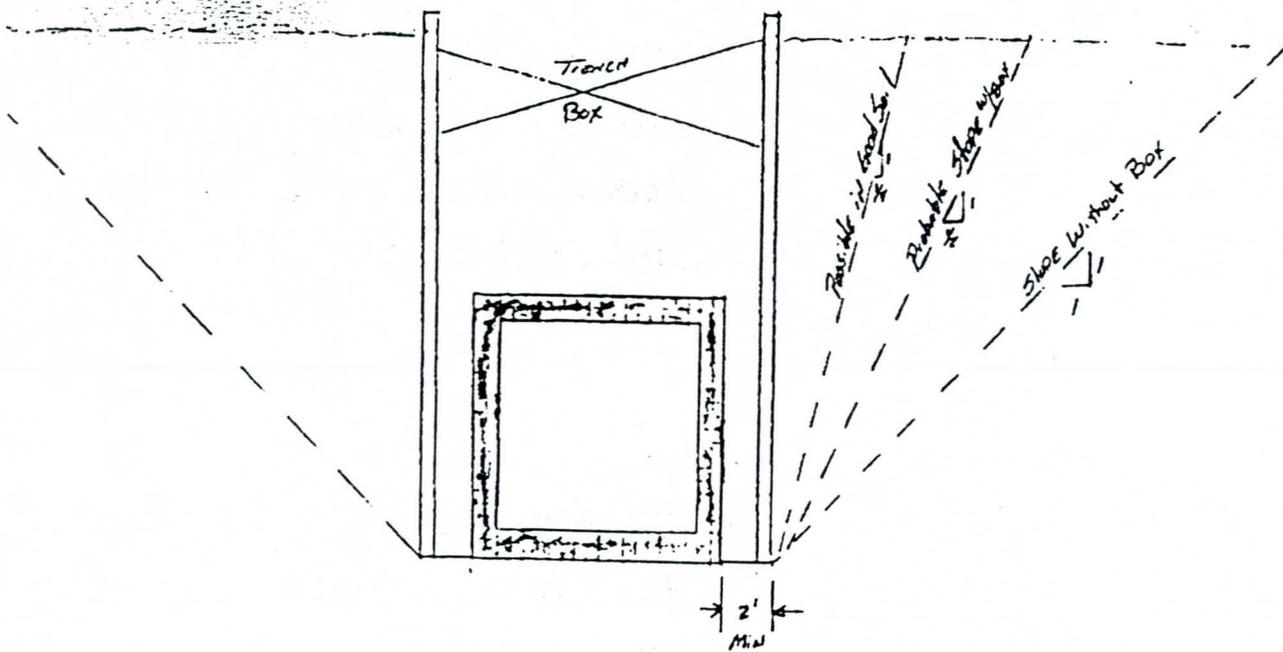
Please review fax. If you have any questions or problems please call
(602) 253-2972

Thankyou.

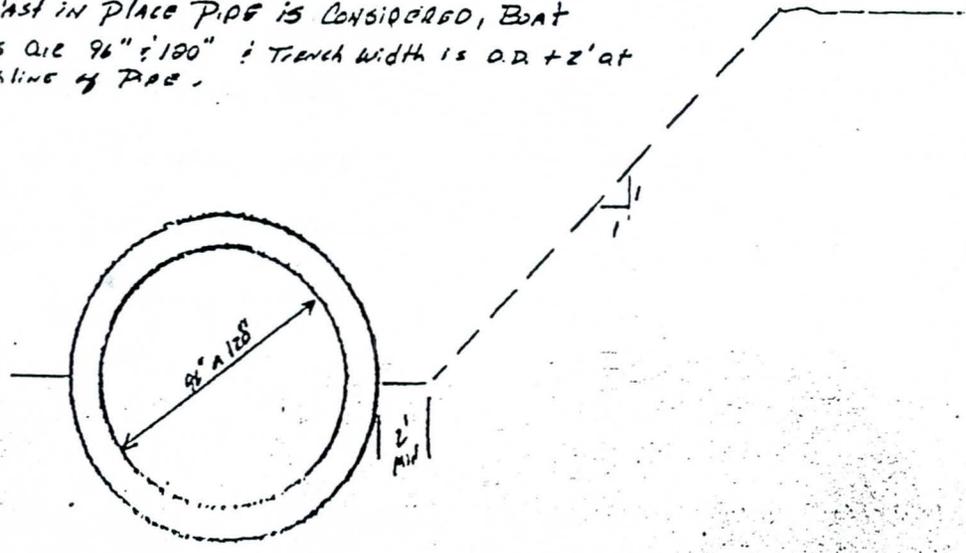
COMMENTS: Your EXCAVATION PLANS will not
meet OSHA STANDARDS without a trench
box - Here are some minimums -

OPERATOR: _____
I suggest relocation of 6" waterline
and moving SD toward sewer,

MINIMUM TRENCH WIDTH
 O.D. + 4' FOR PRECAST
 PIPE OR BOX.
 IN TRENCH BOX



NOTE: IF CAST IN PLACE PIPE IS CONSIDERED, BOX AT
 SIZES ARE 96" & 120" & TRENCH WIDTH IS O.D. + 2' AT
 SPRINGLINE OF PIPE.



TELEPHONE RECORD

DATE 5/12/94

TIME OF CALL 10:20

PROJECT NO. 8156.001

TEL. NO. () 892-7093

PROJECT F.C.D. GRIVERS AVE

CALL TO FROM PHIL BERGER POLICE CONST.

SUBJECT STORM DRAIN LOCATION / TYPE CONDUIT

PHIL HAS DONE WORK IN THIS AREA BID BOTH THE RETENTION BASIN (F.C.D. PROJECT) AND THE 36" WATERLINE - HAD SOILS TEST DONE AND OBSERVED BOTH PROJECT TRENCHES - SAID THIS SOIL HOLDS VERT. VERY WELL.

SUGGESTS THE USE OF PRECAST 8' X 8' BOX BECAUSE IT IS EASIER TO USE AND IS CHEAPER (DO NOT CONSIDER CAST IN PLACE) TRENCH HAS TO BE OPEN FOR ACTION REQUIRED OR TAKEN TOO LONG. REQUIRE 500' OF TRENCH OPEN AT ONCE A MAX. HE DOES NOT FEEL THAT THE WATER LINE WOULD BE A PROBLEM. LIKES THE SECTION - SUGGESTS WE BACKFILL W/ SLURRY TO 1' ABOVE PIPES AS WELL.

NAME _____

FILE _____

TELEPHONE RECORD

DATE 5/12/94

TIME OF CALL 10:40

PROJECT NO. 8156.001

TEL. NO. () 830-8507

PROJECT F.C.D. - GROVERS AVE

CALL TO FROM JERRY HARRIS - KATHEN GARDNER

SUBJECT STORM DRAIN LOCATION / TYPE CONDUIT

JERRY WAS SOME WHAT CONCERNED ABOUT THE WATER LINE. HE DOES NOT HAVE ANY PREVIOUS EXPERIENCE WITH OPEN TRENCHES IN THIS AREA. SUGGESTED REQUIRING PRECAST 8' X 8' BOX (EASIER & FASTER TO WORK WITH) ALLOW ONLY 300'-500' OF TRENCH OPEN AT ONE TIME. ALSO NOTE THAT "CONTRACTOR IS TO PROTECT 36" W.L. IN PLACE AS REQUIRED."

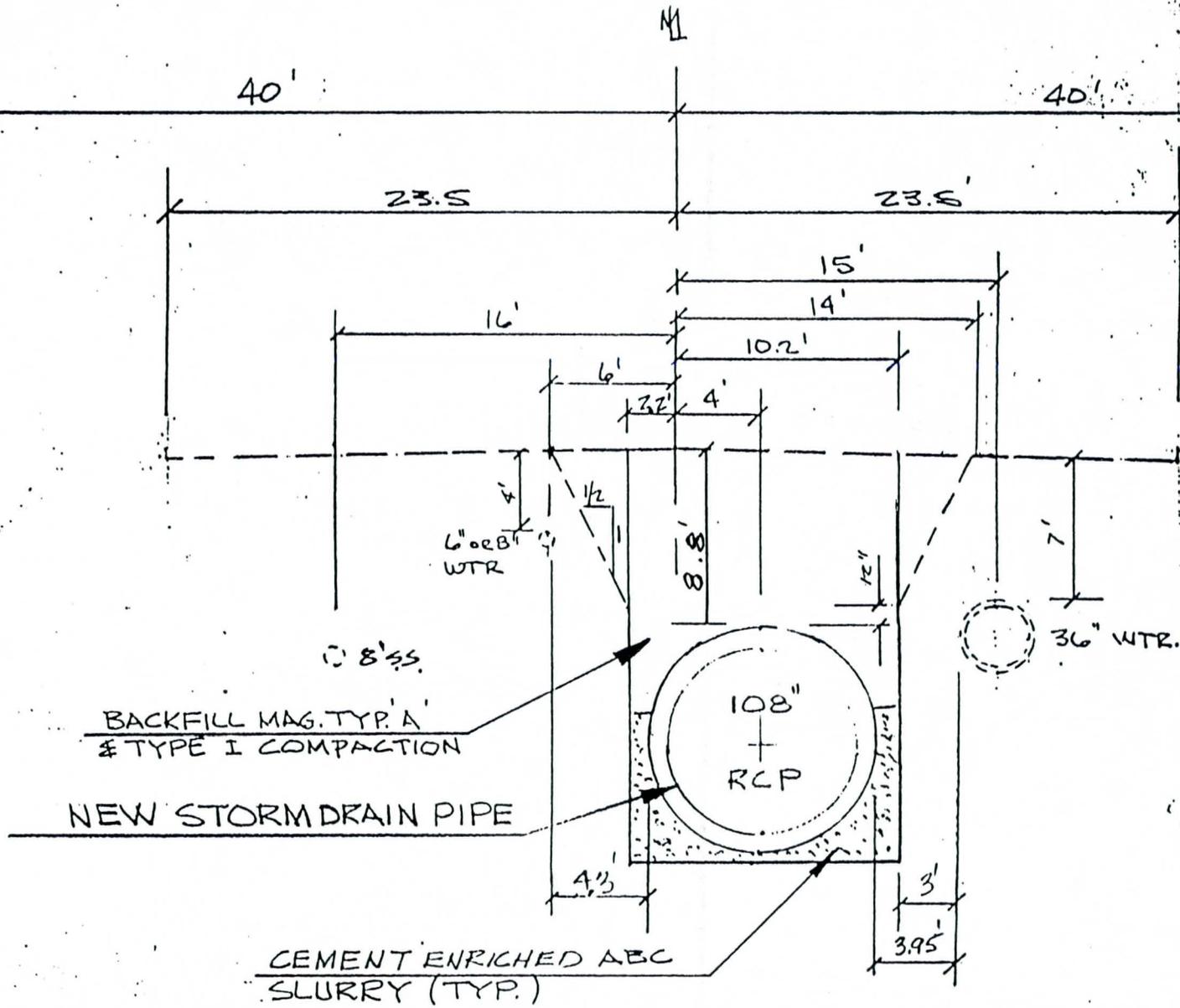
ACTION REQUIRED OR TAKEN SUGGESTED MOVING 1'-2' NORTH - CLOSE TO THE 6" & 8" THEY WOULD BE EASIER TO PROTECT.

SAID IF WE COULD GET 8' X 8' TO THE NORTH THE 84" SHOULD BE NO PROBLEM @ THE 4' OFFSET. THE CITY ENG FROM NESA WAS IN THE OFFICE WITH JERRY AND AGREED WITH THE PRECAST 8' X 8' BOX AND LIKED THE ENRICHED SLURRY TO 1' ABOVE BOX. — USE SOME WITH OUR PIPE.

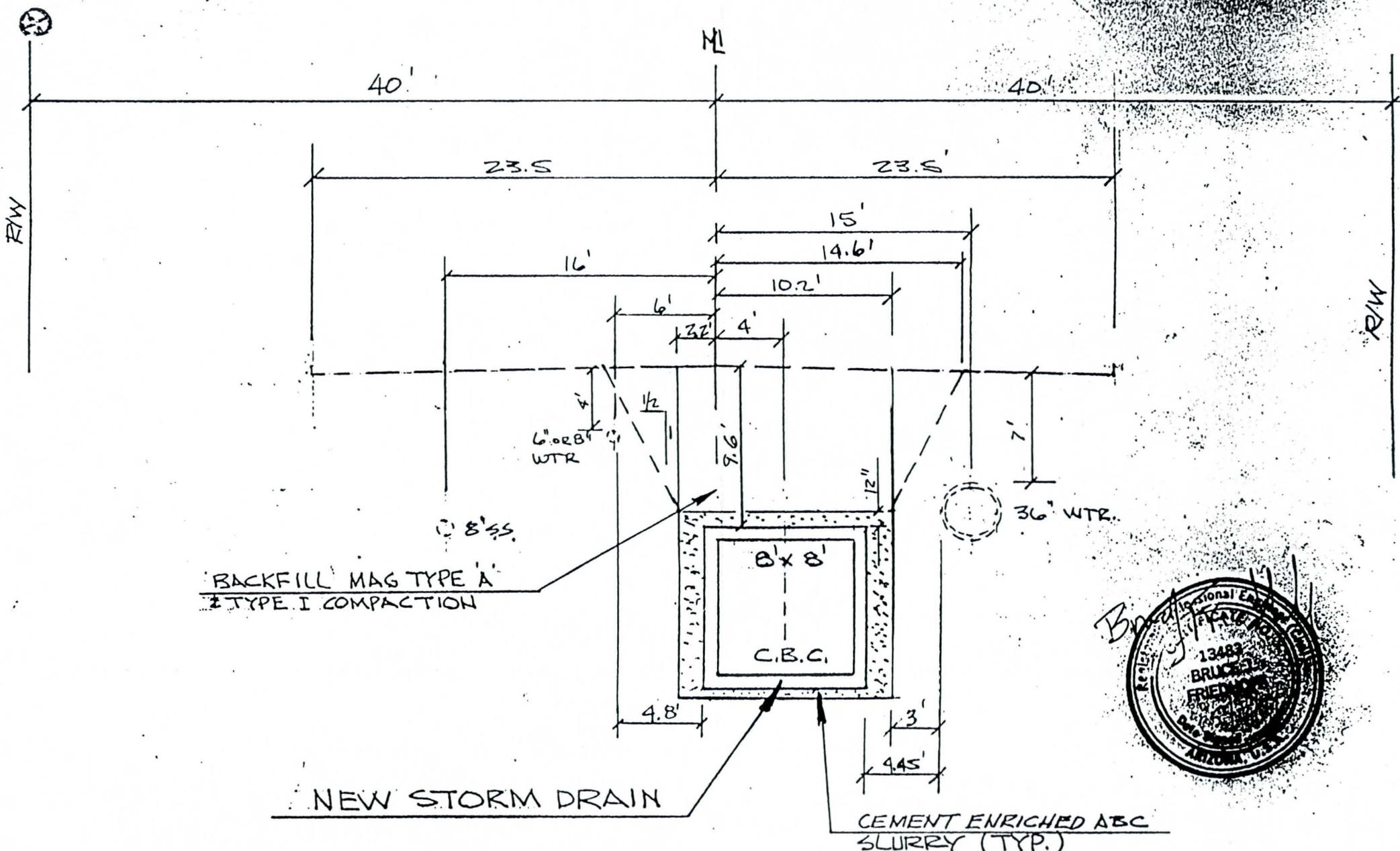
NAME _____

FILE _____

GROVERS AVE.



GROVERS AVE.



May 17, 1994

Mr. Mike Lopez, P.E.
Planning Engineer
Planning & Project Management Division
Flood Control District of Maricopa County
2801 West Durango
Phoenix, AZ 85009

RE: PROGRESS REPORT #5
Grovers Avenue Storm Drain Lateral
Cave Creek Road to 32nd Street
FCD #93-21
MM/CSSA Job No.: 8156.001

Dear Mr. Lopez:

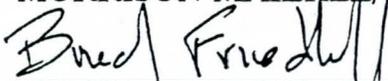
On May 9, 1994, 12 days late we recieved the 30 % submittal review comments from the City of Phoenix. We are updating the attached project schedule accordingly.

Our next milestone will be to submit 60 % plan documents on May 30, 1994.

Please call me concerning any questions you may have.

Sincerely,

MORRISON-MAIERLE/CSSA, INC.



Bruce J. Friedhoff, P.E.
Office Manager

**PROJECT SCHEDULE
GROVERS AVENUE STORM DRAIN LATERAL**

Cave Creek Road to 32nd Street

FCD #93-21

MM/CSSA Job No.: 8156.001

May 17, 1994

TASK NAME	START DATE	DURATION	END DATE	% COMPLETE
NOTICE TO PROCEED	11/03/93	0.0	11/03/93	100
Pre-design Meeting	11/03/93	1.0 W	11/09/93	100
Data Collection	11/10/93	4.0 D	11/13/93	100
Survey Recommendations	11/03/93	1.0 W	11/09/93	100
Soils Recommendations	11/03/93	1.0 W	11/09/93	100
Survey & Mapping	12/06/93	4.0 W	01/21/94	100
Soils Investigation	11/10/93	4.0 W	01/21/94	100
Design Concept Report	12/09/93	3.0 W	01/21/94	100
1ST REVIEW	01/21/94	3.0 W	02/11/94	100
30% Submittal - Initial Design	02/11/94	4.0 W	03/23/94	100
2ND REVIEW	03/23/94	6.0 W	05/09/94	100
60% Submittal - Prel. Design	05/09/94	3.0 W	05/30/94	40
3RD REVIEW	05/30/94	3.0 W	06/20/94	0
90% Submittal - Pre-final Design	06/20/94	3.0 W	07/11/94	0
FINAL REVIEW	07/11/94	3.0 W	08/01/94	0
FINAL SUBMITTAL	08/01/94	2.0 W	08/15/94	0
Bid Solicitation	08/15/94	6.0 W	10/03/94	0
Bid Opening	10/03/94	2.0 W	10/17/94	0
Award Construction Contract	10/17/94	2.0 W	10/31/94	0
Pre-Construction Meeting	10/31/94	2.0 D	11/02/94	0
Construction	11/14/94	4.0 M	03/07/95	0
END PROJECT	03/07/95			

May 5, 1994

Mr. Jerry Arakaki
City of Phoenix
Water and Wastewater Department
Planning and Engineering
200 West Washington
Phoenix, AZ 85003

RE: Grovers Avenue Storm Drain Lateral
Cave Creek Road to 32nd Street
FCD No. 93-21
MM/CSSA Job No. 8156.001
30% SUBMITTAL

Dear Mr. Arakaki

Transmitted under separate cover for your review is one (1) full size set of plans.

If you have any questions please contact me. We look forward to your comments.

Sincerely,

MORRISON-MAIERLE/CSSA, INC.



Bruce J. Friedhoff, P.E.
Project Manager

cc: Michael Lopez, FCDMC

May 2, 1994

Mr. Mike Lopez, P.E.
Planning Engineer
Planning & Project Management Division
Flood Control District of Maricopa County
2801 West Durango
Phoenix, AZ 85009

RE: PROGRESS REPORT #4
Grovers Avenue Storm Drain Lateral
Cave Creek Road to 32nd Street
FCD #93-21
MM/CSSA Job No.: 8156.001

Dear Mr. Lopez:

On March 23, 1994 we submitted the Final Design Concept Report and the 30 % plans for your review. We met last week to discuss your comments and we are proceeding with the 60% plans submittal.

Our next milestone will be to submit 60 % plan documents on May 18, 1994.

Attached herewith for your use is a summary of project status for individual tasks.

Please call me concerning any questions you may have.

Sincerely,

MORRISON-MAIERLE/CSSA, INC.



Bruce J. Friedhoff, P.E.
Office Manager

PROJECT SCHEDULE
GROVERS AVENUE STORM DRAIN LATERAL

Cave Creek Road to 32nd Street

FCD #93-21

MM/CSSA Job No.: 8156.001

May 2, 1994

TASK NAME	START DATE	DURATION	END DATE	% COMPLETE
NOTICE TO PROCEED	11/03/93	0.0	11/03/93	100
Pre-design Meeting	11/03/93	1.0 W	11/09/93	100
Data Collection	11/10/93	4.0 D	11/13/93	100
Survey Recommendations	11/03/93	1.0 W	11/09/93	100
Soils Recommendations	11/03/93	1.0 W	11/09/93	100
Survey & Mapping	12/06/93	4.0 W	01/21/94	100
Soils Investigation	11/10/93	4.0 W	01/21/94	100
Design Concept Report	12/09/93	3.0 W	01/21/94	100
1ST REVIEW	01/21/94	3.0 W	02/11/94	100
30% Submittal - Initial Design	02/11/94	4.0 W	03/23/94	100
2ND REVIEW	03/23/94	4.0 W	04/27/94	100
60% Submittal - Prel. Design	04/27/94	3.0 W	05/18/94	20
3RD REVIEW	05/18/94	3.0 W	06/08/94	0
90% Submittal - Pre-final Design	06/08/94	3.0 W	07/01/94	0
FINAL REVIEW	07/01/94	3.0 W	07/22/94	0
FINAL SUBMITTAL	07/22/94	2.0 W	08/05/94	0
Bid Solicitation	08/09/94	6.0 W	09/20/94	0
Bid Opening	09/20/94	2.0 W	10/04/94	0
Award Construction Contract	10/04/94	2.0 W	10/18/94	0
Pre-Construction Meeting	10/18/94	2.0 D	10/20/94	0
Construction	11/01/94	4.1 M	03/07/95	0
END PROJECT	03/07/95			

March 24, 1994

Mr. Ralph Goodall
City of Phoenix
Street Transportation Department
1034 East Madison
Phoenix, AZ 85003

RE: Grovers Avenue Storm Drain Lateral
Cave Creek Road to 32nd Street
FCD No. 93-21
MM/CSSA Job No. 8156.001
30% SUBMITTAL

Dear Mr. Goodall:

Transmitted herewith are the following documents for your use:

- One (1) copy of the Design Concept Report with your comments.

If you have any questions please contact me. We look forward to your comments.

Sincerely,

MORRISON-MAIERLE/CSSA, INC.



Bruce J. Friedhoff, P.E.
Project Manager

Enclosures

cc: Michael Lopez, FCDMC

March 23, 1994

Mr. Jerry Arakaki
City of Phoenix
Water and Wastewater Department
Planning and Engineering
200 West Washington
Phoenix, AZ 85003

RE: Grovers Avenue Storm Drain Lateral
Cave Creek Road to 32nd Street
FCD No. 93-21
MM/CSSA Job No. 8156.001
30% SUBMITTAL

Dear Mr. Arakaki

Transmitted herewith for your review are two (2) copies of the sewer relocation required for the above referenced project.

If you have any questions please contact me. We look forward to your comments.

Sincerely,

MORRISON-MAIERLE/CSSA, INC.



Bruce J. Friedhoff, P.E.
Project Manager

Enclosures

cc: Michael Lopez, FCDMC

March 23, 1994

Mr. Jerry Arakaki
City of Phoenix
Water and Wastewater Department
Planning and Engineering
200 West Washington
Phoenix, AZ 85003

RE: Grovers Avenue Storm Drain Lateral
Cave Creek Road to 32nd Street
FCD No. 93-21
MM/CSSA Job No. 8156.001
30% SUBMITTAL

Dear Mr. Arakaki

Transmitted herewith for your review are two (2) copies of the sewer relocation required for the above referenced project.

If you have any questions please contact me. We look forward to your comments.

Sincerely,

MORRISON-MAIERLE/CSSA, INC.


Bruce J. Friedhoff, P.E.

Project Manager

Enclosures

cc: Michael Lopez, FCDMC

March 23, 1994

Mr. Ralph Goodall
City of Phoenix
Street Transportation Department
1034 East Madison
Phoenix, AZ 85003

RE: Grovers Avenue Storm Drain Lateral
Cave Creek Road to 32nd Street
FCD No. 93-21
MM/CSSA Job No. 8156.001
30% SUBMITTAL

Dear Mr. Goodall:

Transmitted herewith are the following documents for your review:

1. One (1) full size set of plans (16 sheets).
2. One (1) copy of the Design Calculations.

All review comments received from the FCD and the City of Phoenix have been incorporated into these documents.

Two (2) copies of the sewer relocation are being sent directly to the City of Phoenix Water and Wastewater Department for their review. If you have any questions please contact me. We look forward to your comments.

Sincerely,

MORRISON-MAIERLE/CSSA, INC.



Bruce J. Friedhoff, P.E.
Project Manager

Enclosures

cc: Michael Lopez, FCDMC

March 23, 1994

Mr. Ralph Goodall
City of Phoenix
Street Transportation Department
1034 East Madison
Phoenix, AZ 85003

RE: Grovers Avenue Storm Drain Lateral
Cave Creek Road to 32nd Street
FCD No. 93-21
MM/CSSA Job No. 8156.001
30% SUBMITTAL

Dear Mr. Goodall:

Transmitted herewith are the following documents for your review:

1. One (1) full size set of plans (16 sheets).
2. One (1) copy of the Design Calculations.

All review comments received from the FCD and the City of Phoenix have been incorporated into these documents.

Two (2) copies of the sewer relocation are being sent directly to the City of Phoenix Water and Wastewater Department for their review. If you have any questions please contact me. We look forward to your comments.

Sincerely,

MORRISON-MAIERLE/CSSA, INC.



Bruce J. Friedhoff, P.E.
Project Manager

Enclosures

cc: Michael Lopez, FCDMC

March 23, 1994

Mr. Mike Lopez, P.E.
Planning & Project Management Division
Flood Control District of Maricopa County
2801 West Durango
Phoenix, AZ 85009

RE: Grovers Avenue Storm Drain Lateral
Cave Creek Road to 32nd Street
FCD No. 93-21
MM/CSSA Job No. 8156.001
30% SUBMITTAL

Dear Mr. Lopez:

Transmitted herewith are the following documents for your review:

1. Four (4) full size and two (2) half size sets of plans (16 sheets).
2. Four (4) copies of the Design Calculations.
3. Four (4) copies of the Construction Cost Estimate.
4. Two (2) copies of plans delineating right-of-way and easement requirements.

All review comments received from the FCD and the City of Phoenix have been incorporated into these documents.

Please transmit these documents to the City of Phoenix, affected utility companies, and the Maricopa County Department of Environmental Management for coordination. Two (2) copies of the sewer relocation are being sent directly to the City of Phoenix Water and Wastewater Department for their review. If you have any questions please contact me. We look forward to your comments.

Sincerely,

MORRISON-MAIERLE/CSSA, INC.


Bruce J. Friedhoff, P.E.
Project Manager

March 23, 1994

Mr. Mike Lopez, P.E.
Planning & Project Management Division
Flood Control District of Maricopa County
2801 West Durango
Phoenix, AZ 85009

RE: Grovers Avenue Storm Drain Lateral
Cave Creek Road to 32nd Street
FCD No. 93-21
MM/CSSA Job No. 8156.001
30% SUBMITTAL

Dear Mr. Lopez:

Transmitted herewith are the following documents for your review:

1. Four (4) full size and two (2) half size sets of plans (16 sheets).
2. Four (4) copies of the Design Calculations.
3. Four (4) copies of the Construction Cost Estimate.
4. Two (2) copies of plans delineating right-of-way and easement requirements.

All review comments received from the FCD and the City of Phoenix have been incorporated into these documents.

Please transmit these documents to the City of Phoenix, affected utility companies, and the Maricopa County Department of Environmental Management for coordination. Two (2) copies of the sewer relocation are being sent directly to the City of Phoenix Water and Wastewater Department for their review. If you have any questions please contact me. We look forward to your comments.

Sincerely,

MORRISON-MAIERLE/CSSA, INC.



Bruce J. Friedhoff, P.E.
Project Manager

March 9, 1994

Mr. Michael Lopez, P.E.
Planning & Project Management Division
Flood Control District of Maricopa County
2801 West Durango
Phoenix, Arizona 85009

RE: INLET ALTERNATIVES AT 28TH STREET
Grovers Avenue Storm Drain Lateral
Cave Creek Road to 32nd Street
Project No. 93-21
MM/CSSA Job No. 8156.001

Dear Mr. Lopez:

We have completed our evaluation of three different inlet alternatives that will intercept the incoming design flow of 245 cubic feet per second at the 28th Street and Grovers Avenue intersection. Attached herewith for your use are the geometric configurations and construction cost estimates for these three alternates.

Alternate 1 uses a grated inlet in sump condition between the curb returns to capture the flow-by from the upstream on-grade drop inlets. Alternate 2 uses drop inlets in sump condition to capture the flow-by. And, Alternate 3 uses drop inlets on-grade to intercept all of the flow.

We recommend that Alternate No. 1 be selected for use on this project for the following reasons:

1. Alternate 1 is the least expensive alternate and can be constructed in less time than Alternates 2 and 3. The probable construction costs including the junction structure are as follows:

Alternate 1	\$153,240
Alternate 2	\$176,640
Alternate 3	\$185,030

2. Constructing Alternates 2 and 3 will require closing the school drop-off area.
3. Alternates 2 and 3 have more pipes that could conflict with future utilities.

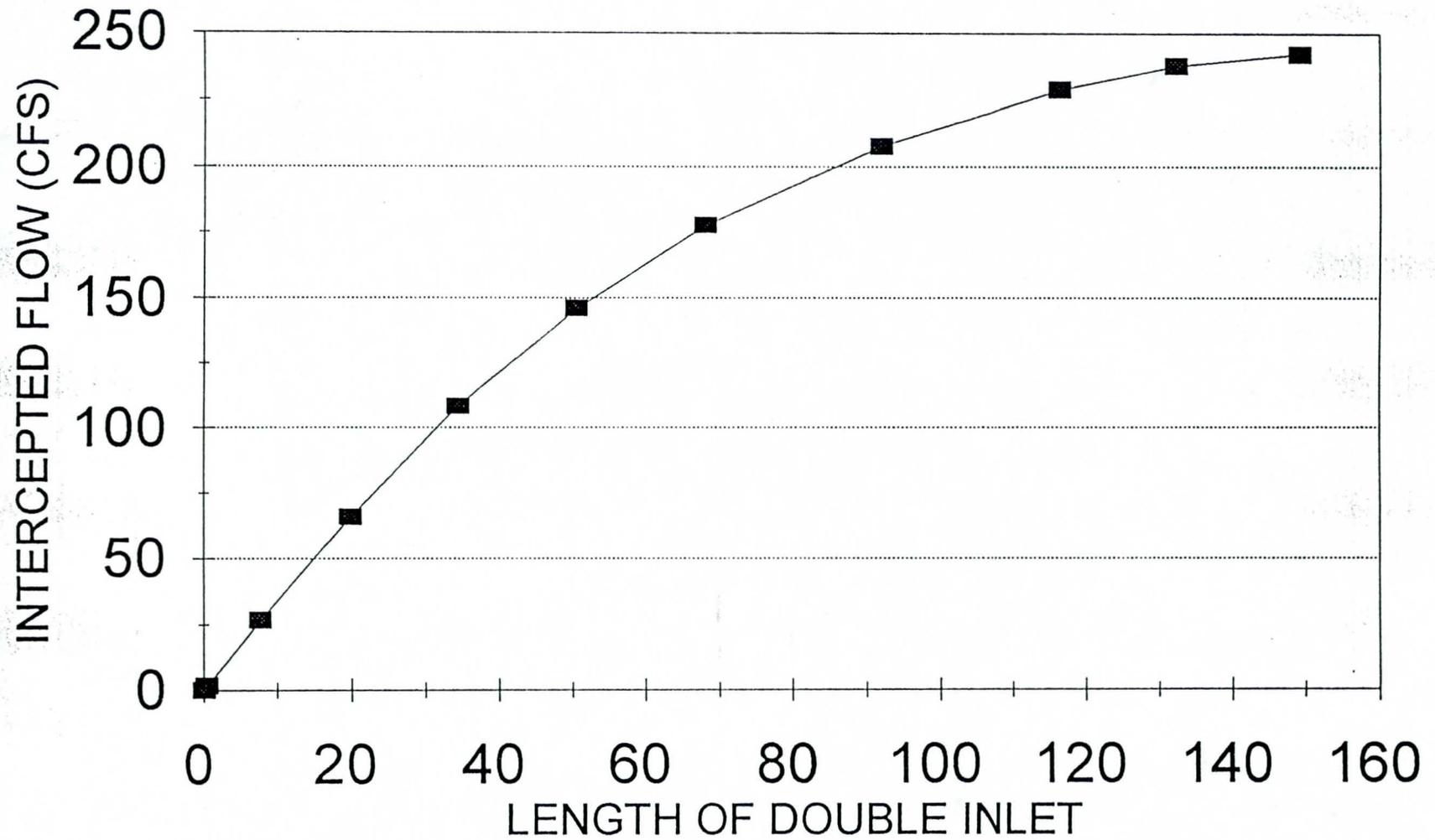
If you have any questions or wish to discuss these alternates in more detail please call me.

Sincerely,

MORRISON-MAIERLE/CSSA, INC.


Bruce J. Friedhoff, P.E.
Office Manager

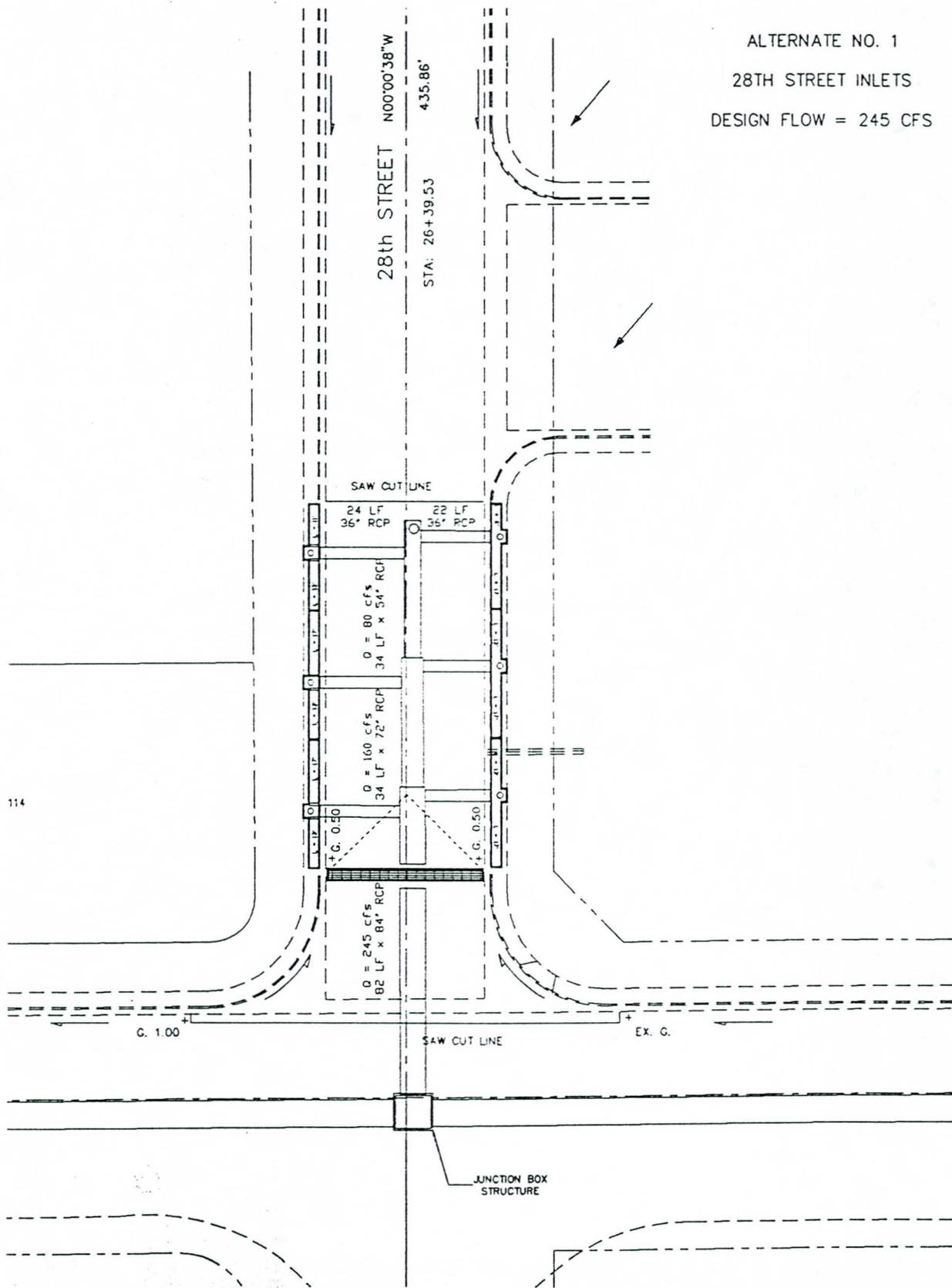
28TH STREET INLETS RATING CURVE



ALTERNATE NO. 1

28th STREET INLETS

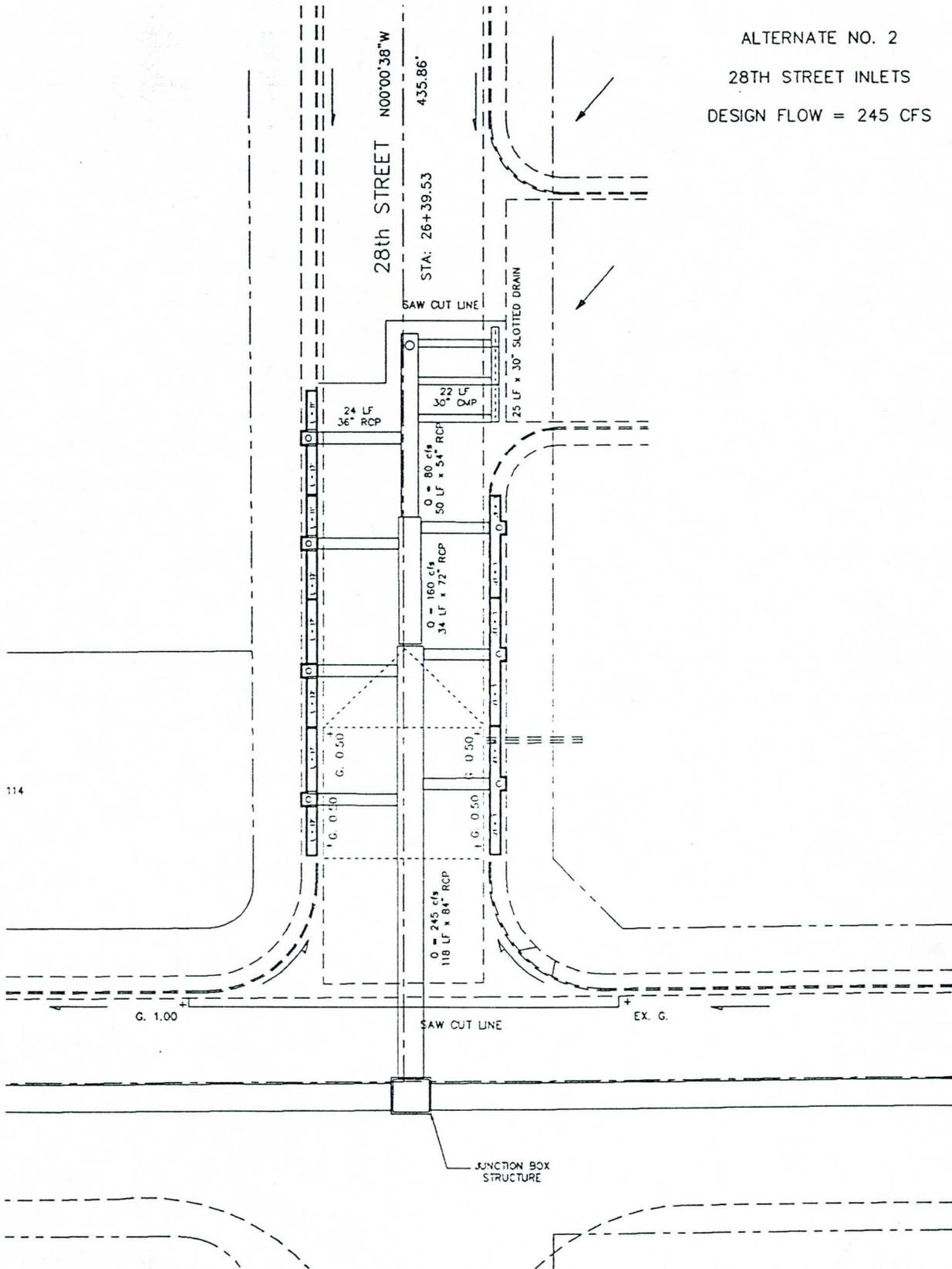
DESIGN FLOW = 245 CFS



28th Street Inlets - Alternate No. 1 Construction Cost Estimate

No.	Description	Unit	Quantit	Unit Cost	Cost
1	30 Inch Corrugated Metal Pipe	feet	0	\$45	\$0
2	36 Inch Reinforced Concrete Pipe	feet	138	\$90	\$12,420
3	54 Inch Reinforced Concrete Pipe	feet	34	\$135	\$4,590
4	72 Inch Reinforced Concrete Pipe	feet	34	\$180	\$6,120
5	84 Inch Reinforced Concrete Pipe	feet	82	\$210	\$17,220
6	54x36 Inch Pre-Fab Tee	ea	2	\$1,400	\$2,800
7	72x36 Inch Pre-Fab Tee	ea	2	\$1,600	\$3,200
8	84x36 Inch Pre-Fab Tee	ea	2	\$2,000	\$4,000
9	48 Inch Man Hole Shaft (MAG 420)	ea	1	\$1,500	\$1,500
10	10x10x10 Foot Junction Structure	ea	1	\$12,000	\$12,000
11	Catch Basin Type M-2, L = 13,17 (P-1569 Mod.)	ea	5	\$4,500	\$22,500
12	Catch Basin Type M-2, L = 6,17 (P-1569 Mod.)	ea	1	\$3,500	\$3,500
13	Slotted Drain, 30" CMP	lf	0	\$90	\$0
14	Catch Basin Type N , L = 36 (P-1570 Mod.)	ea	1	\$9,000	\$9,000
15	Pipe Collar (MAG-505)	ea	1	\$350	\$350
16	Large Diameter Plugs (MAG-427)	ea	1	\$1,000	\$1,000
17	Curb and Gutter, Type 'A', H=6" (MAG-220)	feet	304	\$5.50	\$1,670
18	Concrete Sidewalk (P-1230)	sq ft	1,216	\$2.50	\$3,040
19	Pavement Replacement, C-3/4 x 2" Thick	sq yd	734	\$24.00	\$17,630
20	Concrete Valley Gutter & Apron	sq ft	740	\$4.00	\$2,960
21	Water Line Realignment	ea	1	\$2,200	\$2,200
	Subtotal				\$127,700
	Contingencies	job	20%		\$25,540
	Engineer's Opinion of Construction Cost				\$153,240

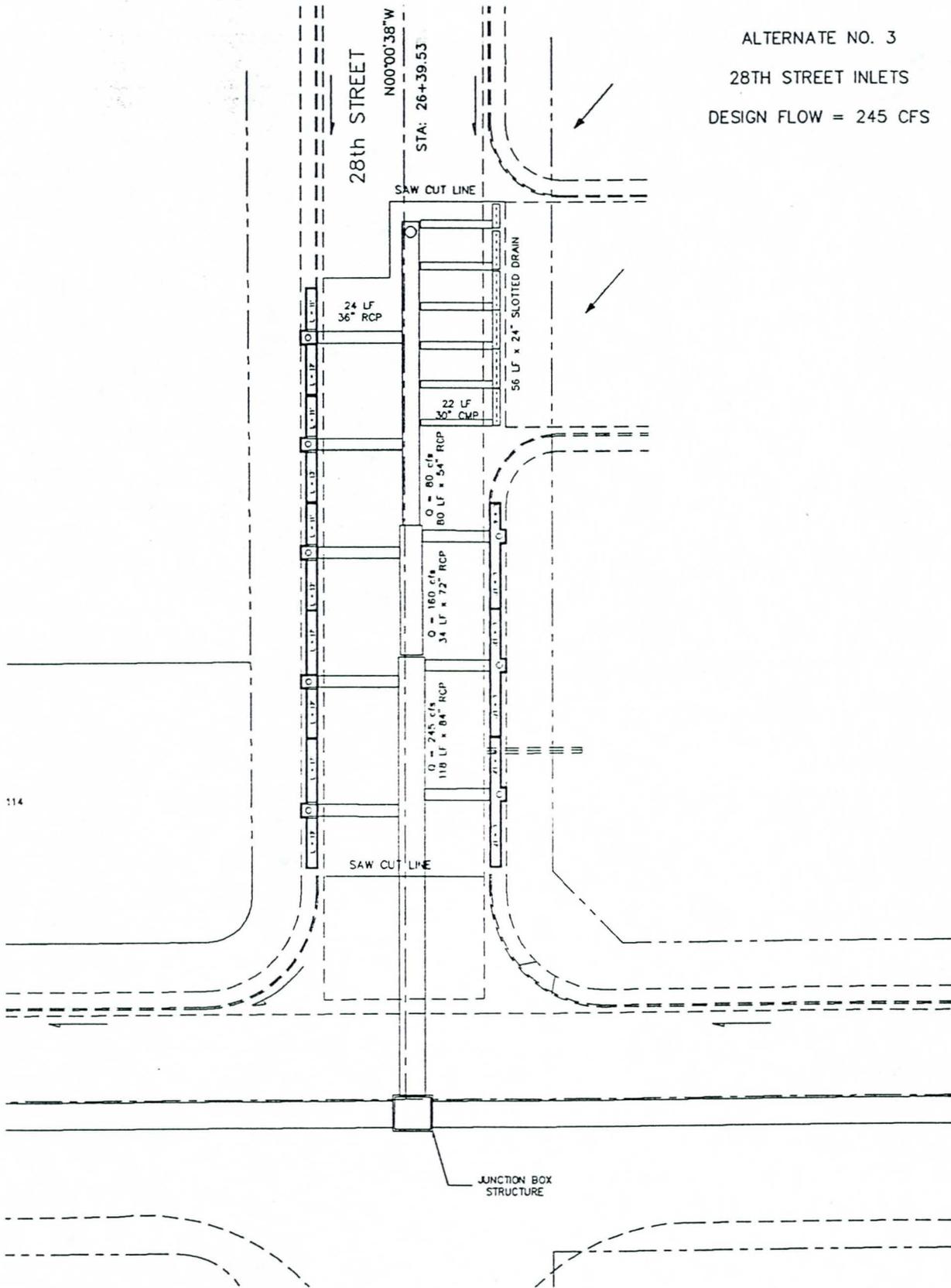
ALTERNATE NO. 2
28TH STREET INLETS
DESIGN FLOW = 245 CFS



28th Street Inlets - Alternate No. 2 Construction Cost Estimate

No.	Description	Unit	Quantity	Unit Cost	Cost
1	30 Inch Corrugated Metal Pipe	feet	66	\$45	\$2,970
2	36 Inch Reinforced Concrete Pipe	feet	162	\$90	\$14,580
3	54 Inch Reinforced Concrete Pipe	feet	50	\$135	\$6,750
4	72 Inch Reinforced Concrete Pipe	feet	34	\$180	\$6,120
5	84 Inch Reinforced Concrete Pipe	feet	118	\$210	\$24,780
6	54x36 Inch Pre-Fab Tee	ea	1	\$1,400	\$1,400
7	72x36 Inch Pre-Fab Tee	ea	2	\$1,600	\$3,200
8	84x36 Inch Pre-Fab Tee	ea	4	\$2,000	\$8,000
9	48 Inch Man Hole Shaft (MAG 420)	ea	1	\$1,500	\$1,500
10	10x10x10 Foot Junction Structure	ea	1	\$12,000	\$12,000
11	Catch Basin Type M-2, L = 13,17 (P-1569 Mod.)	ea	6	\$4,500	\$27,000
12	Catch Basin Type M-2, L = 6,17 (P-1569 Mod.)	ea	1	\$3,500	\$3,500
13	Slotted Drain, 30" CMP	lf	25	\$90	\$2,250
14	Catch Basin Type N , L = 36 (P-1570 Mod.)	ea	0	\$9,000	\$0
15	Pipe Collar (MAG-505)	ea	1	\$350	\$350
16	Large Diameter Plugs (MAG-427)	ea	1	\$1,000	\$1,000
17	Curb and Gutter, Type 'A', H=6" (MAG-220)	feet	334	\$5.50	\$1,840
18	Concrete Sidewalk (P-1230)	sq ft	1,336	\$2.50	\$3,340
19	Pavement Replacement, C-3/4 x 2" Thick	sq yd	959	\$24.00	\$23,010
20	Concrete Valley Gutter & Apron	sq ft	903	\$4.00	\$3,610
	Subtotal				\$147,200
	Contingencies	job	20%		\$29,440
	Engineer's Opinion of Construction Cost				\$176,640

ALTERNATE NO. 3
28TH STREET INLETS
DESIGN FLOW = 245 CFS



28th Street Inlets - Alternate No. 3 Construction Cost Estimate

No.	Description	Unit	Quantit	Unit Cost	Cost
1	30 Inch Corrugated Metal Pipe	feet	132	\$45	\$5,940
2	36 Inch Reinforced Concrete Pipe	feet	138	\$90	\$12,420
3	54 Inch Reinforced Concrete Pipe	feet	80	\$135	\$10,800
4	72 Inch Reinforced Concrete Pipe	feet	34	\$180	\$6,120
5	84 Inch Reinforced Concrete Pipe	feet	118	\$210	\$24,780
6	54x36 Inch Pre-Fab Tee	ea	2	\$1,400	\$2,800
7	72x36 Inch Pre-Fab Tee	ea	2	\$1,600	\$3,200
8	84x36 Inch Pre-Fab Tee	ea	4	\$2,000	\$8,000
9	48 Inch Man Hole Shaft (MAG 420)	ea	1	\$1,500	\$1,500
10	10x10x10 Foot Junction Structure	ea	1	\$12,000	\$12,000
11	Catch Basin Type M-2, L = 13,17 (P-1569 Mod.)	ea	7	\$4,500	\$31,500
12	Catch Basin Type M-2, L = 6,17 (P-1569 Mod.)	ea	1	\$3,500	\$3,500
13	Slotted Drain, 30" CMP	lf	56	\$90	\$5,040
14	Catch Basin Type N , L = 36 (P-1570 Mod.)	ea	0	\$9,000	\$0
15	Pipe Collar (MAG-505)	ea	1	\$350	\$350
16	Large Diameter Plugs (MAG-427)	ea	1	\$1,000	\$1,000
17	Curb and Gutter, Type 'A', H=6" (MAG-220)	feet	249	\$5.50	\$1,370
18	Concrete Sidewalk (P-1230)	sq ft	996	\$2.50	\$2,490
19	Pavement Replacement, C-3/4 x 2" Thick	sq yd	832	\$24.00	\$19,960
20	Concrete Valley Gutter & Apron	sq ft	355	\$4.00	\$1,420
	Subtotal				\$154,190
	Contingencies	job	20%		\$30,840
	Engineer's Opinion of Construction Cost				\$185,030

March 1, 1994

Mr. Mike Lopez, P.E.
Planning Engineer
Planning & Project Management Division
Flood Control District of Maricopa County
2801 West Durango
Phoenix, AZ 85009

RE: PROGRESS REPORT #3
Grovers Avenue Storm Drain Lateral
Cave Creek Road to 32nd Street
FCD #93-21
MM/CSSA Job No.: 8156.001

Dear Mr. Lopez:

On January 21, 1994 we submitted the Design Concept Report and the Preliminary Survey Map for your review. We met last week to discuss your comments and we are proceeding with the 30% plans and the Final Design Concept Report. We will also be evaluating alternative inlet configurations at 28th Street as you requested at the meeting.

Our next milestone will be to submit these three documents on March 14, 1994. The original scheduled 60% design submittal for May 11, 1994 is still good.

Attached herewith for your use is a summary of project status for individual tasks.

Please call me concerning any questions you may have.

Sincerely,

MORRISON-MAIERLE/CSSA, INC.



Bruce J. Friedhoff, P.E.
Office Manager

PROJECT SCHEDULE
GROVERS AVENUE STORM DRAIN LATERAL

Cave Creek Road to 32nd Street

FCD #93-21

MM/CSSA Job No.: 8156.001

March 1, 1994

TASK NAME	START DATE	DURATION	END DATE	% COMPLETE
NOTICE TO PROCEED	11/03/93	0.0	11/03/93	100
Pre-design Meeting	11/03/93	1.0 W	11/09/93	100
Data Collection	11/10/93	4.0 D	11/13/93	100
Survey Recommendations	11/03/93	1.0 W	11/09/93	100
Soils Recommendations	11/03/93	1.0 W	11/09/93	100
Survey & Mapping	12/06/93	4.0 W	01/21/94	100
Soils Investigation	11/10/93	4.0 W	01/21/94	100
Design Concept Report	12/09/93	3.0 W	01/21/94	100
1ST REVIEW	01/21/94	3.0 W	02/11/94	100
30% Submittal - Initial Design	02/11/94	4.0 W	03/14/94	30
2ND REVIEW	03/14/94	3.0 W	04/04/94	0
60% Submittal - Prel. Design	04/04/94	3.0 W	05/11/94	0
3RD REVIEW	05/12/94	3.0 W	06/01/94	0
90% Submittal - Pre-final Design	06/02/94	4.0 W	06/17/94	0
FINAL REVIEW	07/01/94	3.0 W	07/21/94	0
FINAL SUBMITTAL	07/26/94	2.0 W	08/09/94	0
Bid Solicitation	08/09/94	6.0 W	09/20/94	0
Bid Opening	09/20/94	2.0 W	10/04/94	0
Award Construction Contract	10/04/94	2.0 W	10/18/94	0
Pre-Construction Meeting	10/18/94	2.0 D	10/20/94	0
Construction	11/01/94	4.1 M	03/07/95	0
END PROJECT	03/07/95			

February 23, 1994

Mr. Mike Lopez, P.E.
Planning Engineer
Planning & Project Management Division
Flood Control District of Maricopa County
2801 West Durango
Phoenix, AZ 85009

**PROJECT
FILE COPY**

RE: Grovers Avenue Storm Drain Lateral
Upper East Fork Cave Creek Design
Preliminary Concept Review Comments
FCD #93-21
MM/CSSA Job No.: 8156.001

Dear Mr. Lopez:

We have reviewed your comments concerning the Preliminary Concept submittal and will incorporate them in the 30% Design submittal. The following written response is provided for your information as requested:

HYDROLOGY

1. We agree that the 5-minute time interval gives poor definition of the peak flow. A 1-minute interval will be used. The 29-minute and 5-minute intervals were intentional, as were the curve numbers. These were the values used in the original TR-20 model. This preliminary hydrology serves as a Benchmark by which to measure the improvements. In this case a 1% reduction in peak flow from 503 to 499 cfs.
2. We agree that there is nothing inherently incorrect with the use of Papadakis and Kazan equation for estimating the time of concentration. The definition for the SCS time of concentration and the Papadakis and Kazan time of concentration are the same. We believe that using the Papadakis and Kazan regression equation is consistent with both current unit hydrograph theory and the SCS unit hydrograph methodology and results in a good approximation of the subbasin's impulse response function to a uniform rainfall intensity. A comparison of peak flows for Concentration Point 5 demonstrates this point. On page 13 of Appendix A the peak flow for Point 5 was estimated using the runoff intensity as 238 cfs. This compares well with the SCS peak flow of 226 CFS on page 35, a difference of 5 percent. We believe that the resulting discharges are within the range of reasonable expectation.
3. We agree. We will obtain additional hydraulic sections and include this possible split flow condition with the 30% submittal. See attached field data.

February 23, 1994
Mr. Michael Lopez
Page 2

4. The 100-year water surface was taken from the TR-20 Run & Detention Basin Sizing Study for the peak flow elevation of 1439.60 at 13.8 hours to coincide with the peak flow of the Grovers Avenue Lateral. See attached data sheets. If this is not the final design data, please furnish so that we can update our records. Incidentally, we have not yet been furnished with the As-built plans for Basin 3A. Perhaps the basin was constructed a little lower or larger than designed.
5. Yes, a more efficient inlet could be designed to intercept the concentrated flows coming out from under the tennis courts. This would require a storm drain easement from the school. This conflicts with the current project objective of no additional right-of-way. We could extend a storm drain up 29th Street to Charleston Avenue and John Cabot Drive to intercept the flow before it enters the school. However, this would increase project costs by adding pipe in 29th Street and increasing the size of pipe in Grovers Avenue from 28th Street to 29th Street.
6. We agree. A curve number of $CN = 98$ would be more appropriate.
7. We agree.

ENGINEERING COMMENTS

- 1a. It is desirable and is the design policy of the City of Phoenix to intercept runoff before it enters a collector or arterial street such as Grovers Avenue. This improves the trafficability of Grovers Avenue. - The 1/2 street capacity of Grovers is approximately 10 cfs. Not intercepting the flow will cause Grovers Avenue to be flooded between 28th and 29th Streets. Additional inlets will be needed to intercept this flow before reaching the 28th Street intersection. Otherwise, runoff will travel down 28th Street to Bell Road. We would recommend that the inlet remain in 29th Street.
- 1b. Inlets have already been sized using appropriate clogging factors (i.e. 80% on-grade and 50% in-sump). Assuming 100% clogging and adding inlets is redundant and costly. On further review, we recommend that the two inlets mentioned on Page 10 of the DCR be deleted. In other words, we can intercept the 100-year storm without these inlets.
2. It is our intention to modify the standard P-1569 inlet to use 15 ft. wings and a larger maintenance basin (see Appendix A, Pg. 49). These are minor modifications and will give a least cost solution.

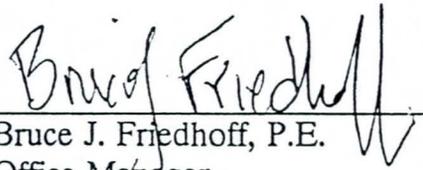
February 23, 1994
Mr. Michael Lopez
Page 3

3. We agree and this calculation will be corrected for the next submittal. It should not have any affect on the sizing of the inlet as weir flow was the controlling condition.
4. See response to Comment #2. Table 3 will be revised to show the modified inlets selected and shown in the cost estimate section.
5. We agree and will change all N-values to $N = 0.015$. Actually, the 28th Street N-value used was 0.015 but the spreadsheet rounded to 0.02 and 0.03 for printing.
6. Please furnish As-built plans. All we have now are design plans.
7. The split flow calculations were computed using Manning's Equation for Uniform Steady State Flow and a common water surface elevation. Hydraulic sections were field measured through the downstream PC's of the curb return. A detailed explanation will be added to the calculations and the formula defined for the variables a, p, r, s, v and Q.

We look forward to discussing these items with you in more detail. Please call me concerning any questions you may have.

Sincerely,

MORRISON-MAIERLE/CSSA, INC.



Bruce J. Friedhoff, P.E.
Office Manager

BJF/cjs

CROSS-SECTIONS C

LIRBY - 28TH ST.

CHALLENGER - 28TH ST.

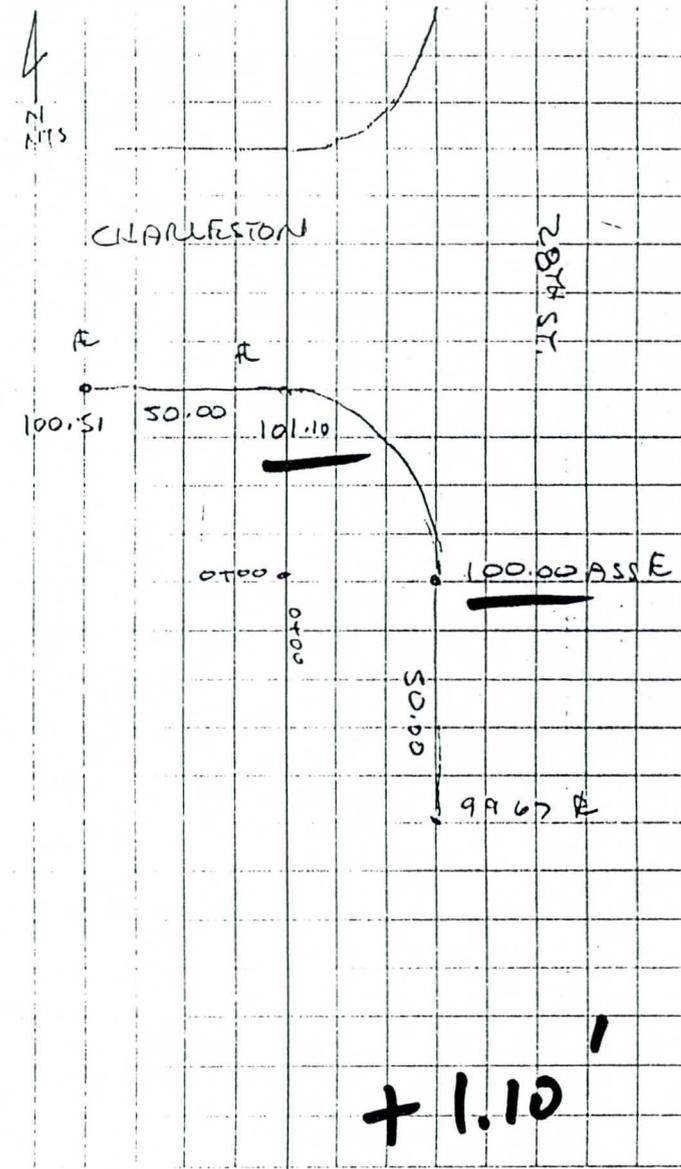
R. WEAVEN

N. POPP

0400	101.1	o/g	101.1
12.0	100.60	B/W	
20.0	100.50	T/C	
20.5	100.00	FE	
44.0	100.43	CROWN	
67.0	100.07	FE	
67.5	100.57	T/C	
71.5	100.65	B/W	
85.5	102.0	FENCE - o/g	

71.0	o/g	101.4
56.0	B/W	101.15
51.5	T/C	101.07
51.2	FE	100.75
36.0	CROWN	100.80
20.5	FE	100.80
20.0	T/C	101.10
16.0	B/W	101.15
0400	o/g	101.1

4
22
21.5



SUMMARY TABLE 1 - SELECTED RESULTS OF STANFORD AND EXECUTIVE CONTROL INSPECTIONS IN THE ORDER PERFORMED
 (A STAR(*) AFTER THE PEAK DISCHARGE TIME AND RATE (CFS) VALUES INDICATES A FLAT TOP HYDROGRAPH
 A QUESTION MARK(?) INDICATES A HYDROGRAPH WITH PEAK AS LAST POINT.)

SECTION/
 STRUCTURE ID OPERATION CONTROL DRAINAGE AREA (SQ MI) RAIN ANTEC RAIN COND INCREM BEGIN (HR) AMOUNT (IN) DURATION (HR) AMOUNT (IN) ELEVATION (FT) TIME (HR) RATE (CFS) RATE (CFS)

SECTION/ STRUCTURE ID	OPERATION CONTROL	DRAINAGE AREA (SQ MI)	RAIN ANTEC	RAIN COND INCREM	BEGIN (HR)	AMOUNT (IN)	DURATION (HR)	AMOUNT (IN)	ELEVATION (FT)	TIME (HR)	RATE (CFS)	RATE (CFS)
SECTION 07	REACH	2.20	1.08	0.0	4.04	24.00	2.56	1453.61	12.61	266.66	1246.9	1246.9
SECTION 07	ADHYD	2.92	1.08	0.0	4.04	24.00	2.24	1458.87	12.93	1418.72	488.8	488.8
SECTION 28	REACH	1.16	1.08	0.0	4.04	24.00	2.21	1459.87	12.76	149.49	957.0	957.0
SECTION 06	REACH	1.16	1.08	0.0	4.04	24.00	2.19	1459.87	12.54	189.70	1245.8	1245.8
SECTION 06	ADHYD	1.28	1.08	0.0	4.04	24.00	2.24	1459.87	12.62	201.90	718.8	718.8
SECTION 04	REACH	1.10	1.08	0.0	4.04	24.00	2.98	1458.87	12.64	141.66	1183.8	1183.8
SECTION 04	ADHYD	1.10	1.08	0.0	4.04	24.00	2.98	1458.87	12.76	109.81	1114.8	1114.8
SECTION 06	REACH	1.10	1.08	0.0	4.04	24.00	2.98	1458.87	12.84	164.91	1299.8	1299.8
SECTION 06	ADHYD	1.25	1.08	0.0	4.04	24.00	2.84	1458.87	12.61	261.90	1129.0	1129.0
SECTION 06	REACH	1.25	1.08	0.0	4.04	24.00	2.84	1458.87	12.61	291.60	1129.0	1129.0
SECTION 06	ADHYD	1.53	1.08	0.0	4.04	24.00	2.29	1458.87	12.61	499.84	910.2	910.2
SECTION 07	REACH	3.45	1.08	0.0	4.04	24.00	2.25	1458.87	12.74	1881.83	590.4	590.4
SECTION 07	ADHYD	3.45	1.08	0.0	4.04	24.00	2.25	1458.87	12.86	1891.83	1291.8	1291.8
SECTION 149	ADHYD	3.52	1.08	0.0	4.04	24.00	2.25	1458.87	12.72	1889.84	640.8	640.8
SECTION 44	REACH	3.52	1.08	0.0	4.04	24.00	2.23	1459.84	13.94	887.84	262.8	262.8
SECTION 44	ADHYD	3.52	1.08	0.0	4.04	24.00	1.94	1431.45	17.63	492.69	181.6	181.6
SECTION 85	REACH	3.59	1.08	0.0	4.04	24.00	1.94	1458.87	17.64	454.09	129.7	129.7
SECTION 85	ADHYD	3.59	1.08	0.0	4.04	24.00	1.94	1458.87	17.64	454.09	129.7	129.7
SECTION 84	REACH	3.59	1.08	0.0	4.04	24.00	2.39	1458.87	12.55	79.29	1298.8	1298.8
SECTION 84	ADHYD	3.54	1.08	0.0	4.04	24.00	1.95	1458.87	17.64	455.49	127.8	127.8
SECTION 91	REACH	1.13	1.08	0.0	4.04	24.00	2.57	1458.87	12.52	169.21	1353.7	1353.7
SECTION 90	REACH	1.13	1.08	0.0	4.04	24.00	2.55	1458.87	12.64	165.02	1320.2	1320.2
SECTION 90	ADHYD	1.11	1.08	0.0	4.04	24.00	2.47	1458.87	12.58	132.92	1219.8	1219.8
SECTION 90	REACH	1.23	1.08	0.0	4.04	24.00	2.52	1458.87	12.61	257.37	1270.8	1270.8
SECTION 88	REACH	1.23	1.08	0.0	4.04	24.00	2.51	1458.87	12.73	292.64	1250.8	1250.8
SECTION 88	ADHYD	1.05	1.08	0.0	4.04	24.00	2.39	1458.87	12.50	62.16	1322.6	1322.6
SECTION 88	REACH	1.05	1.08	0.0	4.04	24.00	2.38	1458.87	12.75	65.34	1198.7	1198.7
SECTION 88	ADHYD	1.09	1.08	0.0	4.04	24.00	2.65	1458.87	12.64	115.03	1223.7	1223.7
SECTION 88	REACH	1.14	1.08	0.0	4.04	24.00	2.66	1458.87	12.68	169.57	1202.6	1202.6
SECTION 88	ADHYD	1.09	1.08	0.0	4.04	24.00	2.53	1458.87	12.71	461.63	1231.0	1231.0
SECTION 88	REACH	1.00	1.08	0.0	4.04	24.00	2.53	1458.87	12.08	159.00	1202.6	1202.6
SECTION 101	DIVERT	1.09	1.08	0.0	4.04	24.00	2.91	1458.87	12.71	302.63	807.0	807.0

FLOOD CONTROL DISTRICT OF MARICOPA CO

DETENTION BASIN SIZING STUDY - BASIN #3A

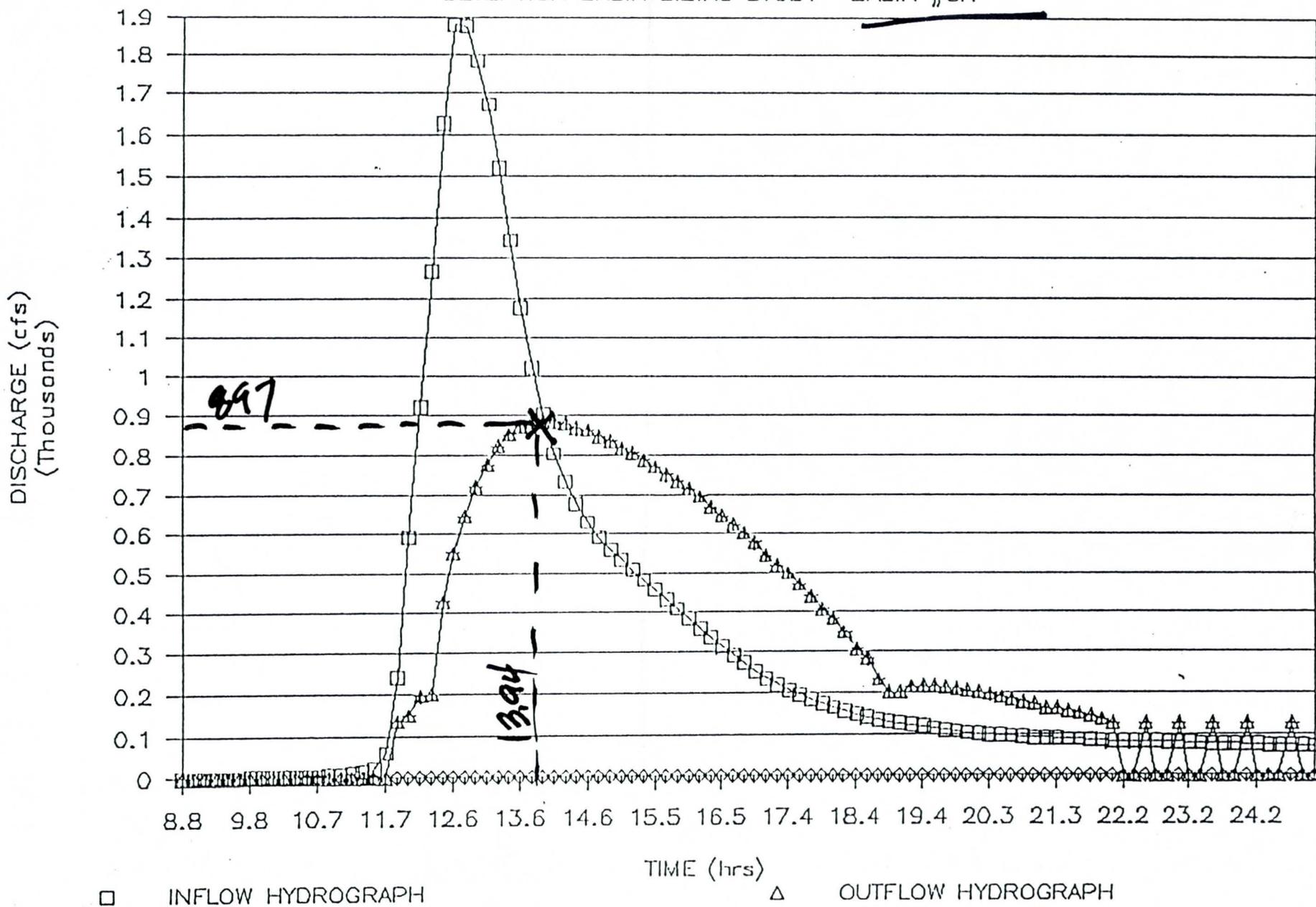


FIGURE 3.3

NBS/LOWERY

January 27, 1994

Mr. Mike Lopez, P.E.
Planning Engineer
Planning & Project Management Division
Flood Control District of Maricopa County
2801 West Durango
Phoenix, AZ 85009

RE: Grovers Avenue Storm Drain Lateral
Cave Creek Road to 32nd Street
Topographic Survey Map
FCD #93-21
MM/CSSA Job No.: 8156.001

Dear Mr. Lopez:

Transmitted under separate cover, via *Commercial Blueprint*, are the following documents:

- One (1) set of Topographic Survey Maps (6 rolled blueprints).

The information on these maps will be field checked and used to prepare construction documents.

If you should have any questions, please feel free to contact me.

Sincerely,

MORRISON-MAIERLE/CSSA, INC.



Bruce J. Friedhoff, P.E.
Office Manager

BJF/cjs

January 17, 1994

Mr. Mike Lopez, P.E.
Planning Engineer
Planning & Project Management Division
Flood Control District of Maricopa County
2801 West Durango
Phoenix, AZ 85009

PROJECT
FILE COPY

RE: PROGRESS REPORT #2
Grovers Avenue Storm Drain Lateral
Cave Creek Road to 32nd Street
FCD #93-21
MM/CSSA Job No.: 8156.001

Dear Mr. Lopez:

On December 1, 1993 we made a progress submittal for the Design Concept Report. Later, we were asked to submit a proposal to add the topographic survey work to our contract. Our survey proposal was reportedly 1/3 of the cost of the FCD's on-call consultant. A written authorization was received on December 27, 1993 to proceed with the survey work. We also received preliminary soils boring logs from Speedie & Associates on December 27, 1993. We are still waiting for the Geotechnical Report.

At the present time, we are finalizing the survey map and the Design Concept Report. The drainage map, hydrology, and hydraulic designs have been completed. We are in the process of finalizing the exhibits and construction costs. Our next milestone will be to submit the Design Concept Report and Preliminary Survey Map on January 21, 1994. The original scheduled 30% design submittal for March 10, 1994 is still good.

Attached herewith for your use is a summary of project status for individual tasks.

Please call me concerning any questions you may have.

Sincerely,

MORRISON-MAIERLE/CSSA, INC.



Bruce J. Friedhoff, P.E.
Office Manager

PROJECT SCHEDULE
GROVERS AVENUE STORM DRAIN LATERAL
 Cave Creek Road to 32nd Street
 FCD #93-21
 MM/CSSA Job No.: 8156.001

TASK NAME	START DATE	DURATION	END DATE	% COMPLETE
NOTICE TO PROCEED	11/03/93	0.0	11/03/93	100
Pre-design Meeting	11/03/93	1.0 W	11/09/93	100
Data Collection	11/10/93	4.0 D	11/13/93	100
Survey Recommendations	11/03/93	1.0 W	11/09/93	100
Soils Recommendations	11/03/93	1.0 W	11/09/93	100
Survey & Mapping	12/06/93	4.0 W	01/21/94	90
Soils Investigation	11/10/93	4.0 W	01/21/94	50
Design Concept Report	12/09/93	3.0 W	01/21/94	90
1ST REVIEW	01/21/94	3.0 W	02/11/94	0
30% Submittal - Initial Design	02/11/94	4.0 W	03/10/94	0
2ND REVIEW	03/10/94	3.0 W	03/29/94	0
60% Submittal - Prel. Design	03/30/94	3.0 W	05/11/94	0
3RD REVIEW	05/12/94	3.0 W	06/01/94	0
90% Submittal - Pre-final Design	06/02/94	4.0 W	06/17/94	0
FINAL REVIEW	07/01/94	3.0 W	07/21/94	0
FINAL SUBMITTAL	07/26/94	2.0 W	08/09/94	0
Bid Solicitation	08/09/94	6.0 W	09/20/94	0
Bid Opening	09/20/94	2.0 W	10/04/94	0
Award Construction Contract	10/04/94	2.0 W	10/18/94	0
Pre-Construction Meeting	10/18/94	2.0 D	10/20/94	0
Construction	11/01/94	4.1 M	03/07/95	0
END PROJECT	03/07/95			

December 1, 1993

Mr. Mike Lopez, P.E.
Planning Engineer
Planning & Project Management Division
Flood Control District of Maricopa County
2801 West Durango
Phoenix, AZ 85009

RE: PROGRESS SUBMITTAL
Grovers Avenue Storm Drain Lateral
Cave Creek Road to 32nd Street
FCD #93-21
MM/CSSA Job No.: 8156.001

Dear Mr. Lopez:

Transmitted herewith for your information are the following preliminary documents:

- Preliminary Right-of-way Map
- Preliminary Drainage Map
- Preliminary Design Criteria
- Preliminary Utility Conflicts
- Drainage Investigation Field Notes

We are still in the process of completing these documents for the Design Concept Report but the following comments are appropriate at this time:

1. A storm drain easement will be needed near the Contention Mining Claim. The exact location and size will be determined in the DCR.
2. A substantial amount of storm water runoff is conveyed in Union Hills Drive and in 32nd Street. We will need to determine how much, if any, of this flow will be conveyed to the Grovers Avenue storm drain. This will be determined for concentration points 1 through 8 during the hydrology analysis.
3. From our site investigation and the drainage map, it appears that a significant portion of the storm water runoff will be concentrated at the northeast corner of 28th Street and Grovers Avenue along the drop-off area for Val Vista School (CP 12). Special inlets and a lateral pipe will be needed in this area.

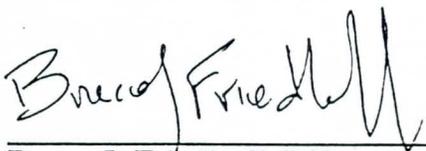
December 1, 1993
Mr. Michael Lopez
Page 2

4. There are two retention basins at CP 9 & 10 that should be included in the hydrology analysis.
5. There is an existing 36" water line on the south side of Grovers Avenue that cannot be disturbed in any way.
6. There is also an 8" sanitary sewer line on the north side of Grovers Avenue that will affect the location of connector pipes and the 28th Street lateral.
7. With your approval, we plan to use HEC-1 with the SCS TR-20 option to analyze the hydrologic conditions for the Grovers Avenue drainage area.

If you have any questions or would like to discuss the above items in more detail, please call me.

Sincerely,

MORRISON-MAIERLE/CSSA, INC.



Bruce J. Friedhoff, P.E.
Office Manager

BJF/cjs

Enclosures

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
GROVERS AVENUE STORM DRAIN
PRELIMINARY DESIGN CRITERIA
(MM/CSSA #8156.001)

Intercept 100-year flow impacting Grovers Avenue between Cave Creek and 30th Street.

Design Q = Q_{100}

Vel. Min. = 2 FPS at 1/2 Design Q or 5 FPS at Design Q

Use HEC-1 (SCS Method) for basin hydrology.

Desired Storm Drain Location: 4 Feet South of Monument Line

Min. Storm Drain Cover = 2 feet.

Pipe Materials: RCP
 Cast-in-place Pipe
 Corrugated Steel Pipe
 Pre-cast Box Conduits

N-Values Pavement = .016 ?
 RCP = .011
 CIPP = .015
 CSP = .022

Minimum pipe size (laterals) = 18" RCP.

Storm drainage design = 100 Year

Catch Basins: Curb Opening
 Grate Inlet
 Slotted Drain
 Combination Inlets
 Special Inlets

Utility Conflicts: 36" Water Main 15 ft. South
 8" Water Main 16 ft. North
 Sewer Main Laterals ?
 Service Connections ?

Catch Basin Capacity Reduction Factors (to be applied to theoretical Catch Basin capacity):

<u>TYPE</u>	<u>FACTOR</u>
Curb Opening, Sump	0.80
Curb Opening, Cont. Grade	0.80
Grate, Sump	0.50
Bar Grate, Cont. Grade	0.75
Bar Grate, Recess. Trans. Bar, Cont. Grade	0.60
Combination Inlet, Sump	0.65
Combination Inlet, Cont. Grade	Use Above
Slotted Drain, Shallow Flow	0.80

Hydraulic Grade Line = 0.5 ft. below inlet elevation.

Hydraulic Grade Line at Detention basin and Grovers Ave. Storm Drain; to be evaluated in Design Concept Report per previous Study.

Manhole Spacing: 660 ft. max. or one city block.

Manhole Types: Mainline with straight deflector and in-line main with 90° lateral.

Pavement Patch:

Improved, match existing pavement section.
Unimproved, 2-1/2" Asphalt

Access Requirements: Maintain access to adjacent properties at all times unless 72 hour notification is provided and accepted by Engineer.

Plan Format:

City of Phoenix Standard Details
MAG Standard Details
MAG Specifications

Plan Layout:

9th Street and 20th Street Major Trunk Storm Sewer Plans (Sample Plans)
Monument Line Control for Stationing
Begin station determined by MM/CSSA = 0+00 at Cave Creek
"North" arrow up on sheets
20 Scale Plan/Profile

Specifications:

MAG Standard Specifications
Special Provisions
Bid alternate pipe types (Cast-in-Place, RCP, CSP, Pre-cast Box Conduits)

NEEDED FROM FCD

1. Detention basin design and storm drain as-builts for improvements stubbed to Grovers Ave.
2. Water Surface Elevation for Q_{100} Design of Detention Basin for HGL determination.
3. Previous Studies
4. Flood Control District to Provide Cover Sheet.
5. TR-20 Hydrology Program ?

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
GROVERS AVENUE STORM DRAIN
UTILITY CONFLICTS
(MM/CSSA #8156.001)

<u>STATION</u>	<u>CONFLICT</u>
0+00	Begin Station Monument Line Cave Creek Road
1+60	8" DIP Water
1+70	W.V. Access Manhole
12+95	8" DIP Water
20+11	6" ACP
Various	Water Service Lines
24+85	6" ACP
26+20	900 Pair Underground Telephone
26+33	8" ACP
26+54	8" DIP Water
26+74	2" ABS Gas
38+25	8" DIP Water
2+00 ± Lateral	8" Sewer, 6" Water, Telephone, CATV
13+00 ± Lateral	8" Sewer, 6" Water, Telephone, UGE, CATV
26+00 ± Lateral	8" Sewer, CATV, 8" Water
43+00 ± Lateral	8" Sewer, 8" Water, Telephone, CATV

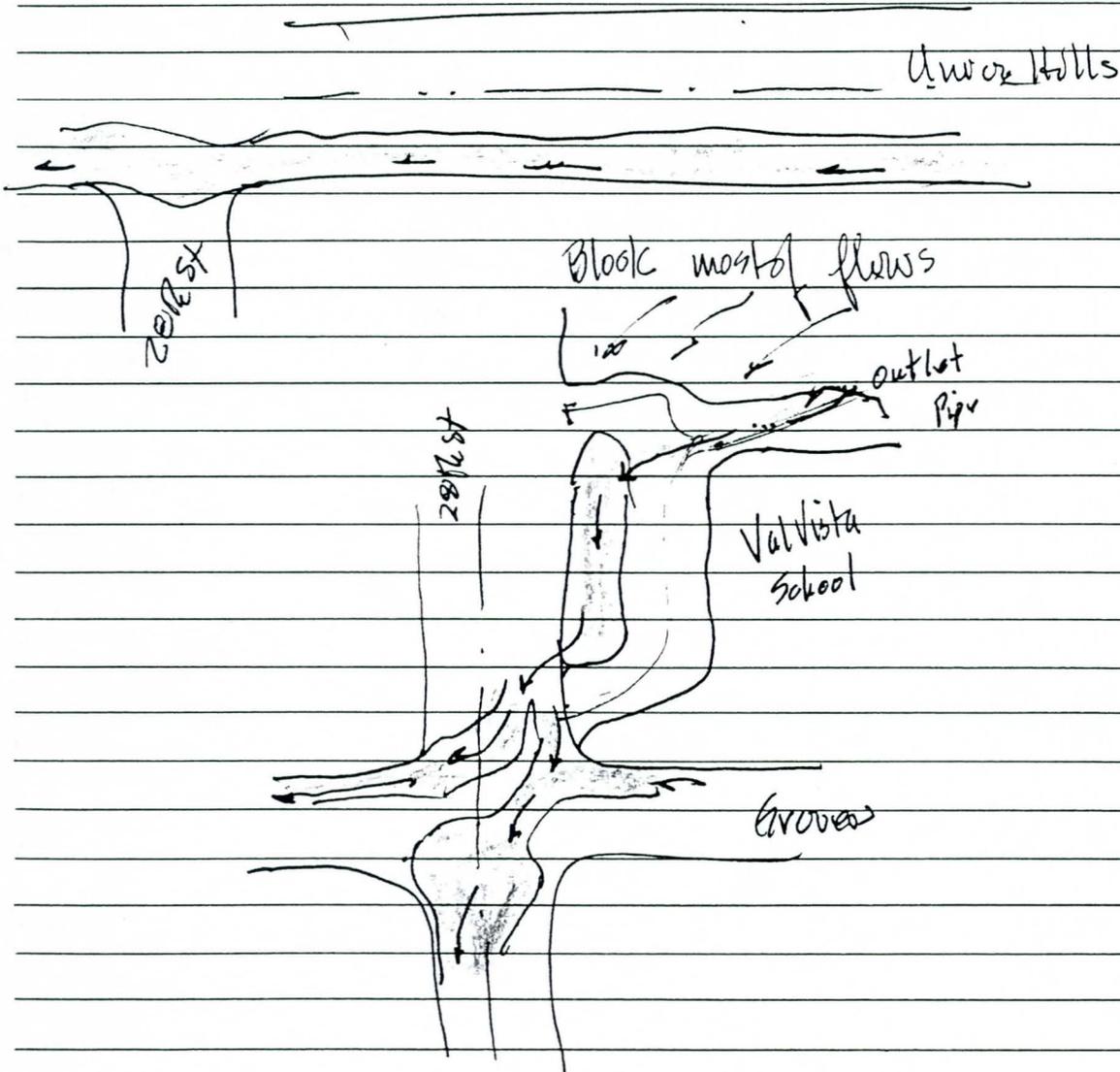
MEMO

TO: File on Groves Avenue

FROM: BJE

SUBJECT: Drainage Investigation (During Light Rain)

DATE: 11/15/93



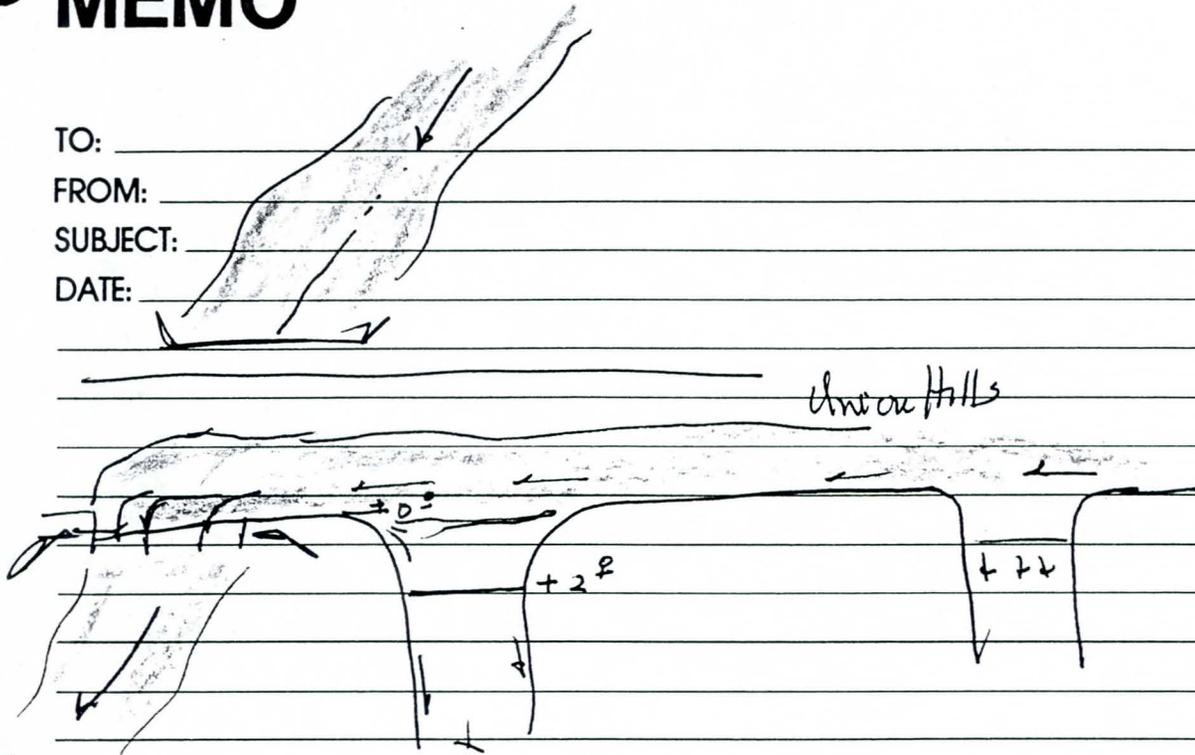
MEMO

TO: _____

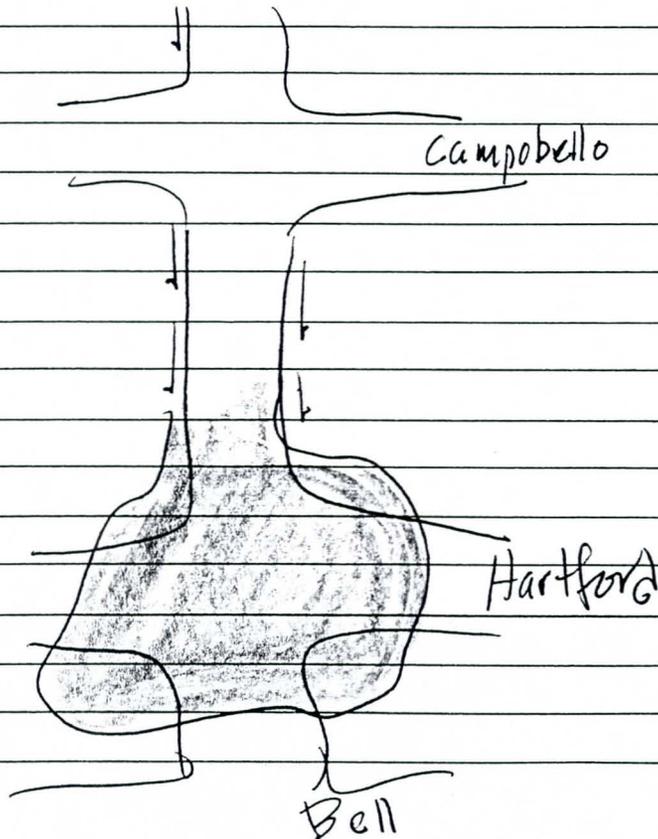
FROM: _____

SUBJECT: _____

DATE: _____

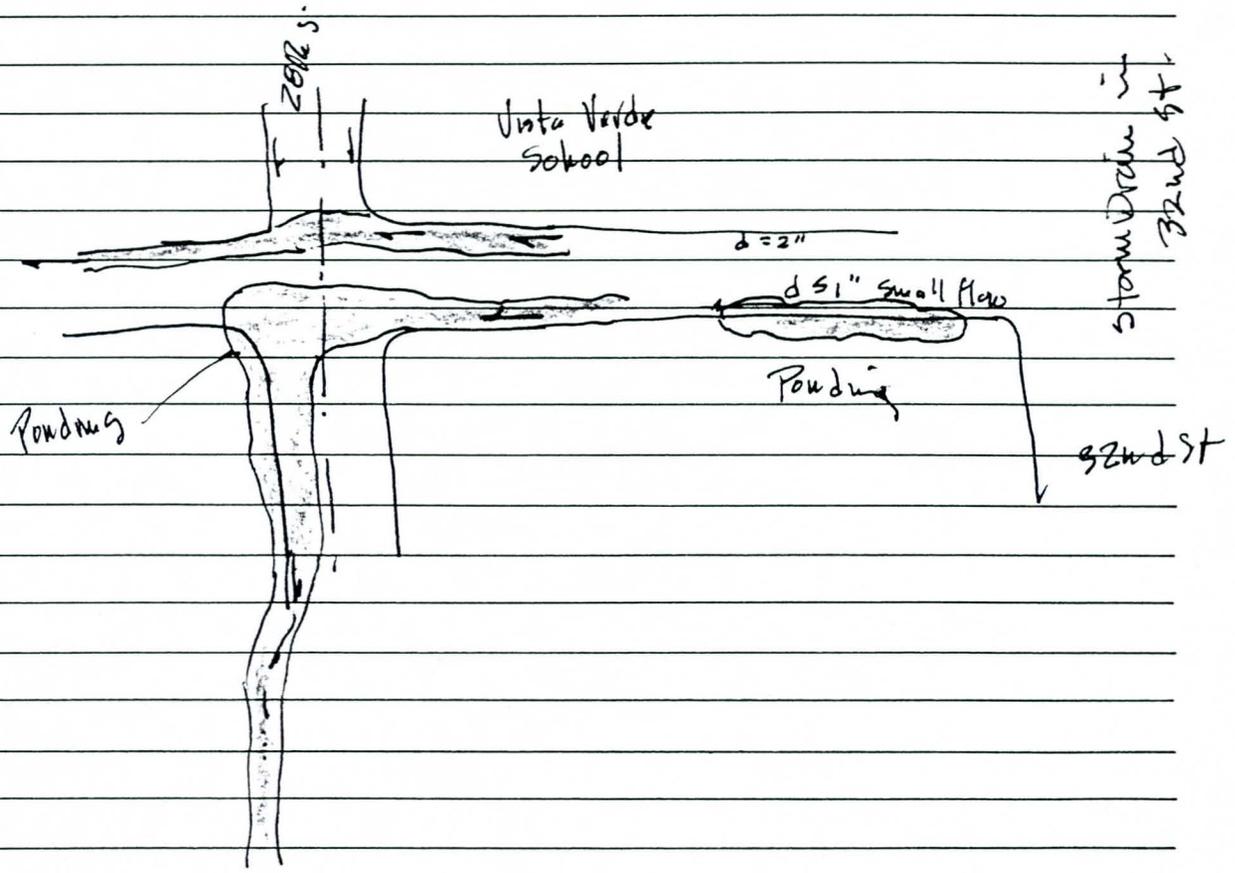
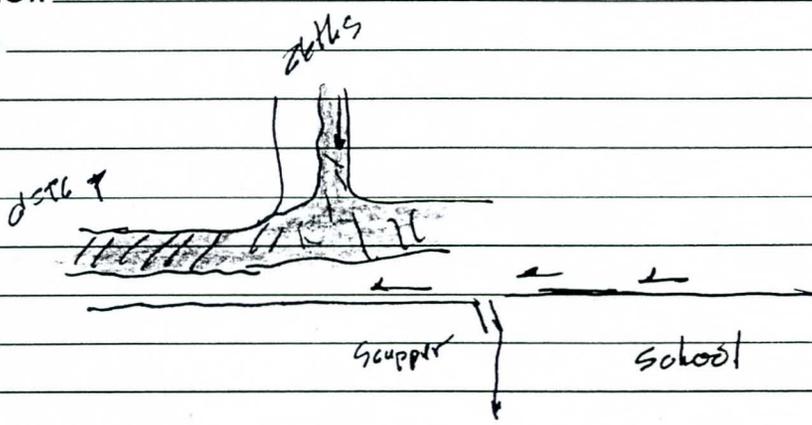


Spills are possible for all streets except 24th



MEMO

TO: _____
FROM: _____
SUBJECT: _____
DATE: _____



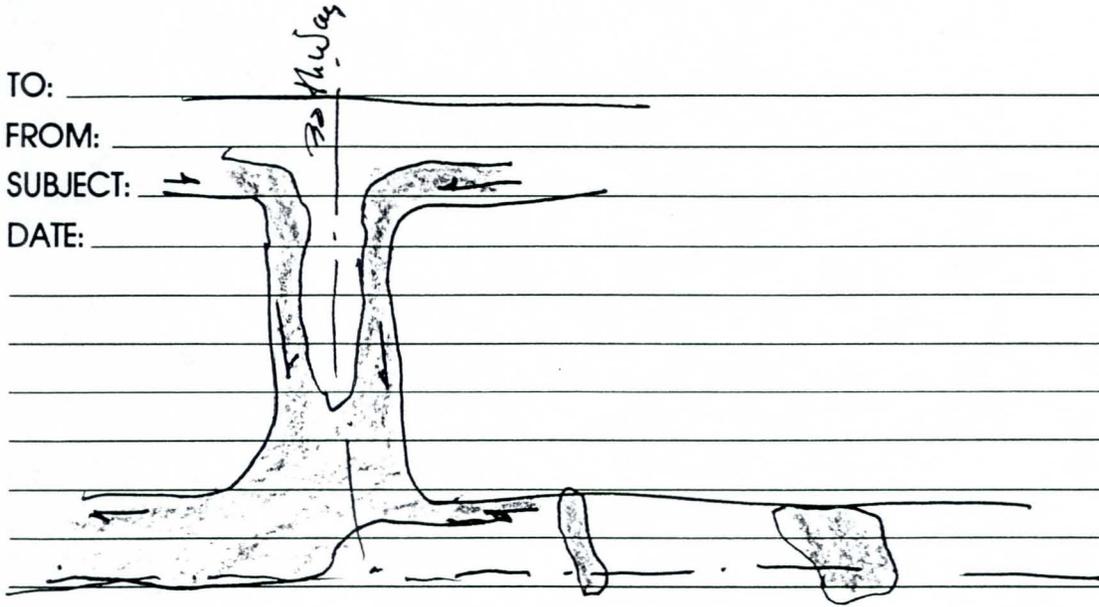
MEMO

TO: _____

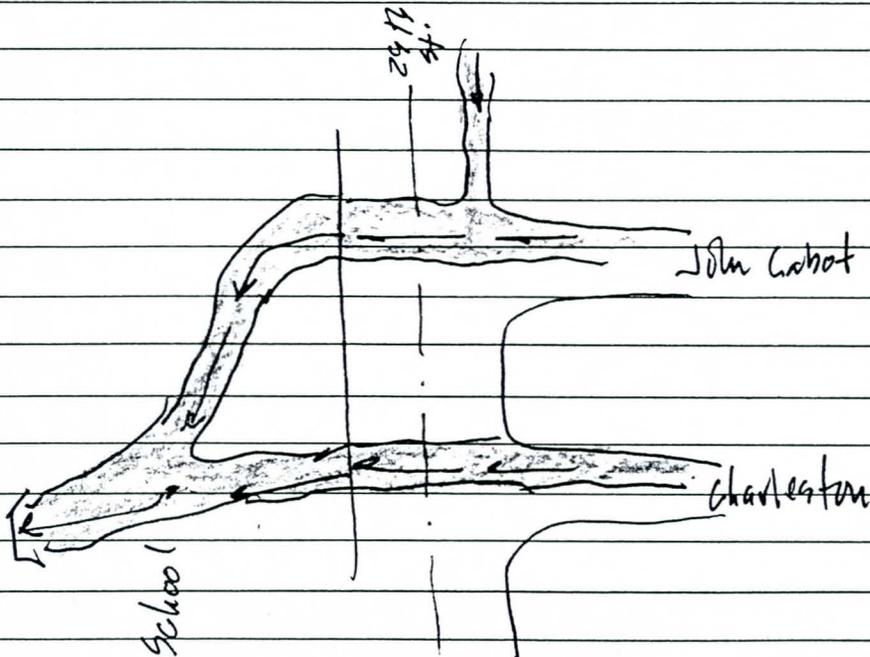
FROM: _____

SUBJECT: _____

DATE: _____



	3101	3113



November 12, 1993

Mr. Mike Lopez, P.E.
Planning Engineer
Planning & Project Management Division
Flood Control District of Maricopa County
2801 West Durango
Phoenix, AZ 85009

FILE COPY

RE: Grover's Avenue Storm Drain Lateral
Cave Creek Road to 32nd Street
FCD #93-21
MM/CSSA Job No.: 8156.001

Dear Mr. Lopez:

Transmitted herewith for your use are the survey and geotechnical requirements for Grover's Avenue.

Please call us concerning any questions you may have.

Very Truly Yours,

MORRISON-MAIERLE/CSSA, INC.



Alexander D. Batt, P.E.
Project Engineer

ADB/cjs

Enclosures

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
GROVERS AVENUE STORM DRAIN
Cave Creek Road to 32nd Street

SURVEY REQUIREMENTS: Furnish a complete topographic survey map for the area shown on the attached map to include the following:

1. Establish vertical control loop on U.S.C&G.S. elevation datum (City of Phoenix).
2. Establish a bench mark each 1,000 feet of the project.
3. Locate and establish monument line in Grovers Avenue, locate or establish monument line of all side streets and horizontal angle horizons intersecting with Grovers Avenue monument line.
4. Indicate widths of all street rights-of-way and any easements on or across rights-of-way.
5. Indicate subdivisions adjacent to Grovers Avenue and side streets back at least 200 feet by lot number and widths showing any easements.
6. Obtain topography within right-of-way including existing curb and gutter, curb returns with radii, sufficient elevations at a minimum 50 foot interval on streets, crowns, grade breaks and intersections to establish drainage patterns and possible catch basin locations.
7. Locate all water lines, services, and valves with elevations of operating nut, hydrants and meter boxes.
8. Locate sanitary sewer lines and manholes, inverts, size of pipe and directions out of manhole.
9. Locate all other utility information within the right-of-way such as poles, street lights, signs, gas valves, electric/phone junction boxes, transformers, risers and guy wires.
10. Furnish Maricopa County legal plats and easement information for the project area and the as-built plans for water and sanitary sewer on Grovers Avenue and adjacent intersecting streets.
11. Prepare survey topographic base map at a scale of 1" = 20' on AutoCAD (Version 12) using MAG and city of Phoenix drafting standards. Furnish diskettes and one CAD vellum plot sealed by a registered land surveyor. Furnish all coordinate geometry and boundary data on diskette and one (1) 8½" x 11" hard copy print-out.
12. Schedule work to follow Bluestake and geotechnical so that the utility and borings can be located in the survey.

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

GROVERS AVENUE STORM DRAIN Cave Creek Road to 32nd Street

GEOTECHNICAL REQUIREMENTS

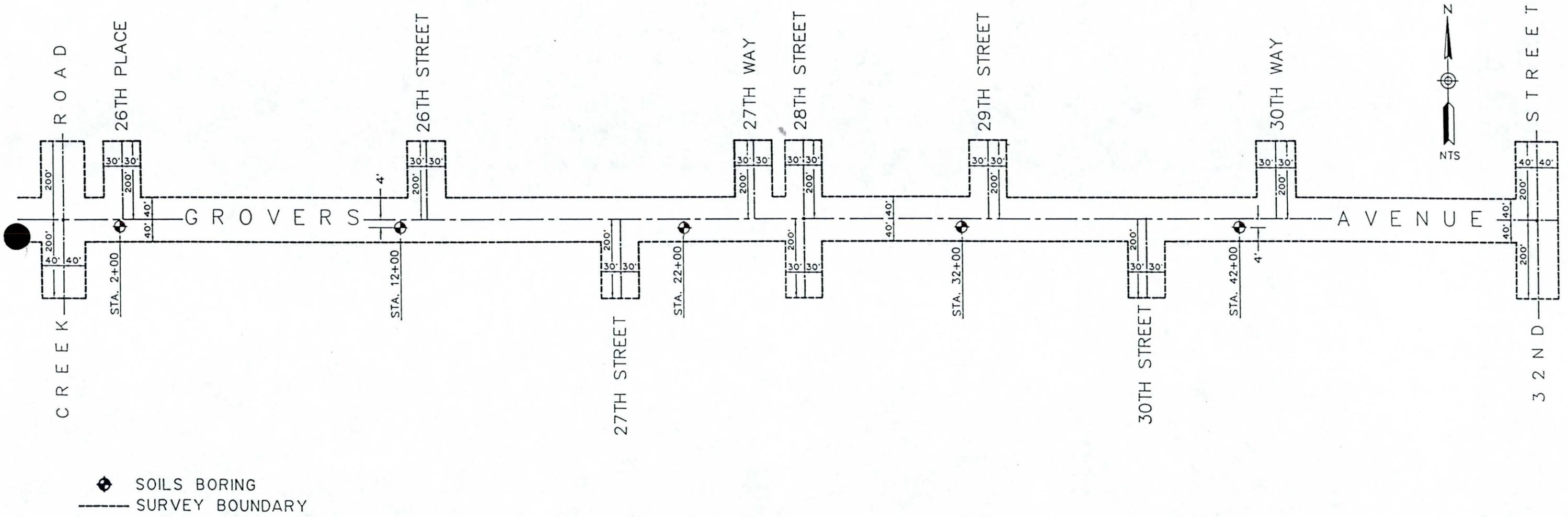
1. Bore five (5) holes with a diameter sufficient to obtain adequate samples for testing and analysis. Holes shall be drilled to a depth of 20 feet below existing grade. The attached map indicates the approximate locations desired.
2. The logs of the borings shall be plotted on AutoCAD (Version 12) 24" x 36" standard sized sheets showing information given for logs in the Soils Report. Furnish diskettes(s) and one full size CAD vellum plot. Boring log data shall include the following information

LOG OF SOILS BORINGS SHEET

1. The name and company that produced the Soils Report.
 2. The date and test boring was made.
 3. The type of equipment used to drill the holes and take the samples.
 4. The size of the auger used.
 5. A description of caving that occurred during the excavations, if any.
 6. Horizons of each type of soil encountered.
 7. Description of the soil.
 8. Classification by AASHTO designation M145 or the Unified Soil Classification System.
 9. Plasticity Index.
 10. Resistivity readings.
 11. Percent passing No 200 sieve.
 12. Water encountered.
 13. Test hole locations.
 14. Existing ground surface.
 15. Elevation scale and same scale profile.
 16. Maximum interval for test borings is 1,000 feet.
3. Provide recommendations for the durability and the constructibility of corrugated metal (steel and aluminum) pipe, reinforced concrete pipe, and cast-in-place concrete pipe. Use an 84" diameter pipe.
 4. Provide recommendations for trench wall stability and shoring requirements.
 5. Provide recommendations for trench backfill and pavement replacement for an 84" diameter pipe.
 6. Coordinate work with survey and Bluestake so that drilling is done prior to survey.

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY GROVERS AVENUE STORM DRAIN

TOPOGRAPHIC SURVEY BOUNDARY MAP



FLOOD CONTROL DISTRICT OF MARICOPA COUNTY GROVERS AVENUE STORM DRAIN

TYPICAL WATER, SEWER AND PROPOSED STORM DRAIN PIPE LOCATION

