McDowell Road Basin and Storm Drain Design Project

Final Data Design Book
Volume II

Registered Professional Engineer (Civil)
CERTIFICATE NO.
24767
ROBERT A.
EICHINGER
Date Signed 2/2/07
ARIZONA U.S.A.

FCD 2006C010
KHA 091131012

February 2007

Ninyo & Moore
Geotechnical and Environmental Sciences Consultants

GEOTECHNICAL EVALUATION
MCDOWELL ROAD BASIN
AND STORM DRAIN
MESA, ARIZONA

PREPARED FOR:
Kimley Horn and Associates, Inc.
7878 North 16th Street, Suite 300
Phoenix, Arizona 85020

PREPARED BY:
Ninyo & Moore
Geotechnical and Environmental Sciences Consultants
3001 South 35th Street, Suite 6
Phoenix, Arizona 85034

January 11, 2006
Project No. 601052001

January 11, 2006
Project No. 601052001

Mr. Bob Eichinger, P.E., CFM
Kimley Horn and Associates, Inc.
7878 North 16th Street, Suite 300
Phoenix, Arizona 85020

Subject: Geotechnical Evaluation
McDowell Road Basin and Storm Drain
Mesa, Arizona

Dear Mr. Eichinger:

In accordance with our Agreement for Services dated July 11, 2005, Ninyo & Moore has performed a geotechnical evaluation for the above-referenced project. The attached report describes our methodology, and presents our findings, conclusions, and recommendations regarding the geologic and geotechnical conditions in the basin area and along the project alignment.

We appreciate the opportunity to be of service to you during this phase of the project. If you have any questions or comments regarding this report, please call at your convenience.

Sincerely,
NINYO & MOORE

A. Tom MacDougall, P.E.
Project Engineer

Steven D. Nowaczyk, P.E.
Principal Engineer

ATM/SDN/RM/rko

Distribution: (6) Addressee
(2) Addressee on CD-ROM

TABLE OF CONTENTS

Page

1. INTRODUCTION 1
2. SCOPE OF SERVICES 1
3. SITE DESCRIPTION 2
4. PROPOSED CONSTRUCTION 3
5. FIELD EXPLORATION AND LABORATORY TESTING 3
6. GEOLOGY AND SUBSURFACE CONDITIONS 6
   - 6.1. Geologic Setting 6
   - 6.2. Subsurface Conditions 7
     - 6.2.1. Fill 7
     - 6.2.2. Alluvium 7
   - 6.3. Groundwater 8
7. GEOLOGIC HAZARDS 8
   - 7.1. Land Subsidence and Earth Fissures 8
   - 7.2. Faulting and Seismicity 9
8. CONCLUSIONS 10
9. RECOMMENDATIONS 11
   - 9.1. Storm Drain Considerations 11
     - 9.1.1. Site Preparation 11
     - 9.1.2. Trench Excavations 12
     - 9.1.3. Construction Dewatering 14
     - 9.1.4. Trench Widths 15
     - 9.1.5. Controlled Low Strength Material 15
     - 9.1.6. Trench Backfill 16
     - 9.1.7. Soil Parameters for Pipeline Design 17
   - 9.2. Pavement Restoration 18
     - 9.2.1. Existing Pavement Section 18
     - 9.2.2. R-value 19
     - 9.2.3. Recommended Asphalt Pavement Sections 19
   - 9.3. Concrete Flatwork 19
   - 9.4. Corrosion 20
   - 9.5. Concrete 21
   - 9.6. Site Drainage 22
   - 9.7. Pre-Construction Conference 22
   - 9.8. Construction Observation and Testing 22
10. LIMITATIONS 22
11. SELECTED REFERENCES 24

Tables

Table 1 – Summary of Depths to Auger Refusal 8
Table 2 – Summary of Depths to Backhoe Refusal 8
Table 3 – Seismic Design Parameters 10
Table 4 – R-Value Summary 19
Table 5 – Recommended Asphalt Pavement Sections 19
Table 6 – IBC Requirements for Concrete Exposed to Sulfate-Containing Soil 21

Illustrations

Figure 1 – Project Location Map
Figure 2 – Exploration Location Map
Figure 3 – Lateral Earth Pressures for Braced Excavation
Figure 4 – Pipe Bedding Detail

Appendices

Appendix A – Boring and Test Trench Logs
Appendix B – Laboratory Test Results
Appendix C – Seismic Refraction Surveys
Appendix D – Agronomic Test Results
Appendix E – *Project Photographs*

1. INTRODUCTION

In accordance with the Agreement for Services dated July 11, 2005, we have performed a geotechnical evaluation for proposed storm drain improvements along McDowell Road, between Hawes Road and Sossaman Road, in Mesa, Arizona. The project also includes the construction of a detention basin at the southwest corner of the intersection of Sossaman Road and McDowell Road. The purpose of our evaluation was to observe existing subsurface conditions along the project alignment and to formulate recommendations relative to the design and construction of the planned improvements.

2. SCOPE OF SERVICES

The scope of our services for the project generally included:

- Reviewing readily available geotechnical reports, geologic maps, as-built data, and aerial photographs.
- Performing a site reconnaissance, notifying Arizona Blue Stake of proposed subsurface work, and coordinating layout of the proposed boring locations with utility companies prior to drilling.
- Drilling, logging, and sampling 15 exploratory test borings within the proposed detention basin and along the storm drain alignment, each extending to depths ranging from about 4.5 to 20 feet below the ground surface (bgs). The boring logs are presented in Appendix A.
- Performing five seismic refraction surveys to evaluate excavation characteristics along the project alignment.
- Excavating five test trenches using a backhoe to evaluate excavation characteristics, observe soil conditions, and correlate geophysical testing.
- Performing pavement cores at two locations along McDowell Road in areas above the proposed storm drain. Photographs of the cores are presented in Appendix E.
- Testing selected soil samples in our laboratory to evaluate in-situ moisture content and dry density, grain-size distribution, Atterberg limits, expansion index, response to wetting behavior (hydro-consolidation), standard Proctor moisture-density relationships, R-values, unconfined compression strength of the cemented soils, and corrosion characteristics (including pH, minimum electrical resistivity, soluble sulfates, and chlorides). The results of the laboratory testing are presented on the logs in Appendix A and/or in Appendix B.
- Performing agronomic soil testing to assist in the landscaping of the detention basin.

- Preparing this report to present our findings, conclusions, and recommendations regarding the design and construction of the planned improvements.

Our scope of services did not include environmental consulting services, such as hazardous waste sampling or analytical testing, at the site. A detailed scope of services and estimated fee for such services can be provided upon request.

3. SITE DESCRIPTION

The project alignment is located within Township 1 North, Range 6 East, Sections 5, 6 and Township 2 North, Range 7 East, Section 32. The alignment extends along McDowell Road, from just west of Sossaman Road to Hawes Road, and about two miles south of the Salt River in Mesa, Arizona. The general location of the project area is depicted on the Project Location Map (Figure 1). At the time of our evaluation, the site consisted of an asphalt paved roadway bordered by residences and undeveloped desert.

According to the *Buckhorn, Arizona-Maricopa Co., 7.5-Minute United States Geological Survey (USGS) Topographic Quadrangle Map, (1982),* the average elevation in the detention basin area is approximately 1,640 feet relative to mean sea level (MSL). The ground surface elevations along McDowell Road range from roughly 1,645 feet MSL at the west end to roughly 1,750 feet MSL at the east end. Based on the information obtained from this map, the topography in the project vicinity slopes from the northeast down to the southwest.

Four aerial photographs were reviewed for this project. A 1967 United States Department of Agriculture (USDA) aerial photograph depicts the site as an unpaved road surrounded by farmland and undeveloped desert. A 1992 USGS aerial photograph depicts the site as a paved roadway primarily surrounded by undeveloped desert and scattered drainages. The aerial photograph also shows a few residences surrounding the roadway. The detention basin area was depicted as undeveloped desert. A 1999 aerial photograph from *Landiscor's Phoenix Real Estate Photo Book* and a 2004 aerial photograph from the Maricopa County Assessor's website also show the basin area as undeveloped desert. The storm drain alignment is depicted as a paved roadway surrounded by residences and scattered parcels of undeveloped desert, similar to the current

conditions. Our evaluation of the aerial photographs and visual reconnaissance did not indicate any large disturbed areas that might be indicative of past undocumented development or areas of large-scale earthwork.

4. PROPOSED CONSTRUCTION

The proposed improvements associated with this project include:

- Construction of a new, landscaped detention basin to the southwest of the intersection of McDowell Road and Sossaman Road;
- Installation of storm drain piping (diameters ranging from 60 inches to 102 inches) and appurtenances using cut and cover techniques. Stormwater from an existing private drainage system at Hawes Road and various inlets along McDowell Road will be diverted through the storm drain to the existing Las Sendas Wash or, in high flow situations, the new detention basin; and
- Restoring the pavement sections for roadways which overlie the storm drain alignment.

The new detention basin will occupy approximately 15,000 square feet and the base elevation will be approximately 10 to 15 feet lower than the surrounding ground surface elevations. During low flow events, storm water will be diverted to the Las Sendas Wash. During high-flow events, a subsurface weir/splitter will divert runoff into the landscaped detention basin.

We have assumed that the conveyance pipe will be placed below other existing utilities and invert elevations will be up to approximately 17 feet bgs. It is our understanding that reinforced concrete pipe (RCP) will be used for the stormwater lines and will be installed using cut-and-cover techniques. We understand that Controlled Low Strength Material (CLSM) will be used as backfill from the invert elevation to the spring line. According to the proposed design concept, various pipe diameters are planned along various sections of this storm drain segment ranging from 54 inches at the inlet to 102 inches at the outlet.

5. FIELD EXPLORATION AND LABORATORY TESTING

Ninyo & Moore utilized a phased approach within the proposed detention basin area and along the proposed storm drain alignment in order to evaluate the existing subsurface conditions and to

collect soil samples for laboratory testing. Four phases were utilized and consisted of: hollow-stem auger borings, seismic refraction surveys, test trenches, and sonic borings. Each phase is discussed below.

On August 2 and 3, 2005, Ninyo & Moore conducted the first phase of the subsurface exploration, which consisted of the drilling, logging, and sampling of 13 small-diameter borings and coring through the existing pavement section. The borings were drilled using a CME-75 truck-mounted drill rig equipped with hollow-stem augers. The borings, denoted as B-1 through B-13, were planned to extend to about 20 feet bgs. However, auger refusal was encountered in borings B-2 through B-13 at depths shallower than planned. As such, those borings were terminated at depths ranging from 4.5 to 18 feet bgs. Boring B-1 extended about 19 feet bgs. Bulk and relatively undisturbed soil samples were collected at selected intervals. Detailed descriptions of the soils encountered at each boring location are presented on the boring logs in Appendix A. The pavement section was cored to measure the thickness of the asphaltic concrete (AC) and the underlying aggregate base. Approximately 5.5 inches of AC over 6 inches of AB was measured in PC-1 and approximately 5 inches of AC over 5 inches of AB was measured at PC-2. The approximate locations of the borings and pavement cores are shown on Figure 2.

Ninyo & Moore personnel logged the borings in general accordance with the Unified Soil Classification System (USCS) and American Society for Testing and Materials (ASTM) D 2488) by observing cuttings and drive samples. Collected ring samples were trimmed in the field, wrapped in plastic bags, and placed in cylindrical plastic containers to retain in-place moisture conditions. Similarly, the Standard Penetration Test and bulk samples were sealed in plastic bags to retain their approximate in-place moisture.

The second phase of the field exploration included seismic refraction surveys. The surveys were performed on September 28, 2005 to evaluate rippability characteristics. A SmartSeis S12 seismograph and 12 geophones were utilized to collect generalized and approximate velocities of seismic waves transmitted through subsurface soils. Correlations between the seismic wave velocities and excavatability, and additional discussion on the seismic refraction surveys are provided in Appendix C. The locations of the surveys are shown on Figure 2.

Five test trenches were excavated on September 29, 2005 to evaluate excavatability, to collect samples, and to compare our observations with the seismic refraction results. Test trenches were excavated near the locations of the seismic refraction surveys and are also shown on Figure 2. A Case 580 backhoe, with a reach of approximately 11 feet, was used to excavate the trenches. A Ninyo & Moore geologist was on-site to log the excavated soils and to collect bulk and chunk samples at selected intervals. Logs of the trenches are included in Appendix A.

The fourth phase of exploration included advancing two borings to approximately 20 feet bgs using sonic drilling techniques. Sonic drilling employs the use of high frequency mechanical vibration and rotation to advance a steel casing into the subsurface materials. It can penetrate many soil or rock strata on which conventional hollow-stem auger would refuse. The sonic borings were advanced on October 7, 2005 at the locations shown on Figure 2. Ninyo & Moore personnel logged the observed soils and collected samples at selected intervals. Detailed descriptions of the soils encountered at the two boring locations are presented on the boring logs in Appendix A.

The soil samples collected from our field activities were transported to the Ninyo & Moore laboratory in Phoenix, Arizona for geotechnical laboratory analysis. The laboratory testing included evaluation of the following:

- In-situ moisture content and dry density;
- Grain-size distribution;
- Atterberg limits;
- Standard Proctor moisture-density relationships;
- Response to wetting behavior (hydro-consolidation)
- Expansion Index;
- R-value; and
- Corrosion characteristics (including pH, minimum electrical resistivity, soluble sulfates, and chlorides).

The results of the laboratory tests are presented on the logs in Appendix A and/or in Appendix B. Also, Appendix B contains additional descriptions of each laboratory test performed. Agronomic soil testing was performed on selected samples of the basin soils by Fruit Growers Laboratory of Santa Paula, CA, and the test results are presented in Appendix C.

6. GEOLOGY AND SUBSURFACE CONDITIONS

The geology and subsurface conditions at the site are described in the following sections.

6.1. Geologic Setting

The project site is located in the Sonoran Desert Section of the Basin and Range Physiographic Province, which is typified by broad alluvial valleys separated by steep, discontinuous, subparallel mountain ranges. The mountain ranges generally trend north-south and northwest-southeast. The basin floors consist of alluvium with thickness extending to several thousands of feet.

The basins and surrounding mountains were formed approximately 10 to 13 million years ago during the mid- to late-Tertiary age. Extensional tectonics resulted in the formation of horsts (mountains) and grabens (basins) with vertical displacement along high-angle normal faults. Intermittent volcanic activity also occurred during this time. The surrounding basins filled with alluvium from the erosion of the surrounding mountains, as well as from deposition from rivers. Coarser-grained alluvial material was deposited at the margins of the basins near the mountains. The surficial geology of the site is comprised of 3 units. These units consist of late Pleistocene (10,000 to 250,000 years) alluvial fan and terrace deposits, a combination of late Pleistocene and Holocene deposits (< 250,000 years), and middle Pleistocene (250,000 to 750,000 years) alluvial fan and terrace deposits. Particle sizes in the late Pleistocene deposits range from sand to cobbles and boulders. These soils have moderate soil development with argillic horizons and calcic horizons (stage I to III). The second unit is a combination of both late Pleistocene and Holocene alluvial deposits. This unit has a variety of young and older soils with grain sizes ranging from silt to boulders. The middle Pleistocene deposits consist of particle sizes ranging from sand to boulders, fining down-

stream. These deposits have strong soil development characterized by argillic horizons and calcic horizons (stage II to IV) (Pearthree and Huckleberry, 1994). Descriptions of the soils encountered during our evaluation are presented in the following section.

6.2. Subsurface Conditions

Our knowledge of the subsurface conditions at the project site is based on our field exploration and laboratory testing and our understanding of the general geology of the area. The following sections provide a generalized description of the materials encountered. More detailed descriptions are presented on the boring logs in Appendix A.

6.2.1. Fill

Fill soils were encountered at the surface of borings B-6 and B-13, extending to depths ranging from approximately 1.5 to 3.5 feet bgs. The fill generally consisted of silty sand.

6.2.2. Alluvium

Alluvium was encountered at the surface of borings B-1 through B-5, B-7 through B-12, B-1A and B-2A, and below the fill soils in B-6 and B-13. Generally, the alluvium extended to the total depth explored. This material generally consisted of silty or clayey sand with gravel. Scattered caliche filaments and weakly to strongly cemented soils were observed within the alluvium. In some cases, auger and backhoe refusal was encountered and therefore the explorations did not reach the target depths as explained in Section 5 of this report. Table 1 summarizes the depth to auger refusal encountered in the borings (if applicable). Table 2 summarizes the depth to backhoe refusal for the test trenches. The depths to auger and backhoe refusal may not correlate with field rippability.

Table 1 – Summary of Depths to Auger Refusal

Boring Number	Depth of Auger Refusal (feet)	Boring Number	Depth of Auger Refusal (feet)
B-2	4.5	B-8	6
B-5	16	B-9	18
B-4	16	B-10	6
B-5	16	B-11	11
B-6	16	B-12	9.5
B-7	6	B-13	16

Table 2 – Summary of Depths to Backhoe Refusal

Test Trench ID	Depth of Backhoe Refusal (feet)
L-2	6.9
L-3	7.5

6.3. Groundwater

Groundwater was not encountered in our borings. Based on well data from the Arizona Department of Water Resources, the approximate depth to groundwater is on average over 100 feet bgs. In general, groundwater does not need to be considered for the design and the construction of the project. However, groundwater levels can fluctuate due to seasonal variations, irrigation, groundwater withdrawal or injection, and other factors.

7. GEOLOGIC HAZARDS

The following sections describe potential geologic hazards at the site, including land subsidence and earth fissures, faulting and seismicity, surface rupture, and liquefaction.

7.1. Land Subsidence and Earth Fissures

Groundwater depletion due to groundwater pumping has resulted in land subsidence and earth fissures in numerous alluvial basins in southern Arizona. It has been estimated that subsidence has affected more than 3,000 square miles and has caused damage to a variety of

engineered structures and agricultural land (Schumann and Genualdi, 1986). From 1948 to 1983, excessive groundwater withdrawal has been documented in several alluvial valleys where groundwater levels have been reportedly lowered by up to 500 feet. With such large depletions of groundwater, the alluvium has undergone consolidation resulting in large areas of land subsidence.

In Arizona, earth fissures are generally associated with land subsidence and pose an on-going geologic hazard. Earth fissures generally form near the margins of geomorphic basins where significant amounts of groundwater depletion have occurred. Reportedly, earth fissures have also formed due to tensional stress caused by differential subsidence of the unconsolidated alluvial materials over buried bedrock ridges and irregular bedrock surfaces (Schumann and Genualdi, 1986).

Based on our field reconnaissance and review of the referenced material, there are currently no known earth-fissures underlying the subject alignment. Based on our research, the closest earth fissure to the site is located approximately 5 miles to the southeast of the project site, where water levels have dropped by approximately 300 feet or more. While the future occurrence of land subsidence and earth fissures cannot accurately be predicted, continued groundwater withdrawal in the area may result in subsidence and the formation of new fissures or the extension of existing fissures. Continued subsidence may increase the storm drain grade and may cause some areas of pipe failure.

7.2. Faulting and Seismicity

The site lies within the Sonoran Zone, which is a relatively stable tectonic region located in southwestern Arizona, southeastern California, southern Nevada, and northern Mexico (Euge et al., 1992). This zone is characterized by sparse seismicity and few Quaternary faults. Based on our field observations, review of pertinent geologic data and analysis of aerial photographs, faults are not located on or adjacent to the project. The closest fault to the site is the Sugarloaf fault, located approximately 18 miles to the northeast of the site (Pearthree, 1998). Up to 5 meters of displacement has occurred along this fault within upper and uppermost Pleistocene deposits, but middle Holocene deposits are not displaced.

Based on a Probabilistic Seismic Hazard Assessment for the Western United States, issued by the USGS (1999), the site is located in a zone where the peak ground accelerations that have a 10 percent, 5 percent, and 2 percent probability of being exceeded in 50 years are 0.05g, 0.07g and 0.11g, respectively. Due to the relatively low ground motions, seismic hazards (e.g., liquefaction, ground shaking, etc.) are considered to be negligible. Seismic design parameters according to the 2003 International Building Code (IBC) are presented in the following table.

Table 3 – Seismic Design Parameters

Parameter	Value	2003 IBC Reference
Site Class Definition	C	Table 1615.1.1
Site Coefficient F_a	1.2	Table 1615.1.2 (1)
Site Coefficient F_v	1.7	Table 1615.1.2 (2)

8. CONCLUSIONS

Based on the results of our subsurface evaluation, laboratory testing, and data analysis, it is our opinion that the proposed construction is feasible from a geotechnical standpoint, provided that the recommendations of this report are incorporated into design and construction of the proposed project, as appropriate. Geotechnical considerations include the following:

- Refusal was encountered in 12 of 13 auger borings and in two of five test trenches. Borings and test trenches exposed strata with strong caliche cementation. It should be anticipated that the on-site soils will be difficult to excavate and will require specialized excavation equipment and techniques (e.g., hoe-ram, rock saw, blasting, etc.).

- Although cemented soils were encountered along the proposed alignment, due to interbedded layers of uncemented sandy material, the likely vibrations that will exist near open trenches (due to the adjacent roadway and construction activity), and the potential consequence of slope instability (road closure, structural damage), an OSHA soil-type "C" should be used for planning excavation side slopes. Due to the diameter of the pipe, and according to OSHA requirements, shoring will likely be needed during construction.

- We estimate an earthwork (shrinkage) factor of 5 to 15 percent for this project.

- Soils generated from on-site excavation activities that exhibit a very low to low expansion potential can generally be used as engineered fill. The on-site soils that we tested met this criterion. Cobbles and soil particles larger than 3 inches should not be used as backfill material unless appropriately processed.

- Groundwater was not observed in our borings. The groundwater table in the area on average is more than 100 feet bgs based on the nearby well data. In general, groundwater is not anticipated to be a design or construction consideration. However, groundwater levels can fluctuate due to seasonal factors. If considerable rainfall occurs or is anticipated during or near the time of construction, the contractor may wish to advance test holes prior to excavation to see if perched water or groundwater is present in the excavation zone.
- No known or documented geologic hazards are present underlying or adjacent to the site.
- Corrosivity test results indicate that subgrade soils at the site may be corrosive to ferrous metals, and the sulfate content of the soils present a negligible sulfate exposure to concrete.

9. RECOMMENDATIONS

Based on our understanding of the project, the following recommendations are provided for the design and construction of the proposed storm drain. If the proposed construction is changed from that discussed in this report, Ninyo & Moore should be contacted for additional recommendations.

9.1. Storm Drain Considerations

The following sections provide our recommendations relating to the storm drain construction and design. In general, the specifications contained in Maricopa Association of Governments (MAG), *Uniform Standard Specifications and Details for Public Works Construction (2002)* are expected to apply unless noted.

9.1.1. Site Preparation

Construction areas should be cleared of unsuitable materials, including grass, weeds, asphalt pavement, concrete, old construction debris, and any other material that might interfere with the performance or progress of the work.

Within the limits of clearing and below the ground surface, roots, deleterious, or other objectionable material should be grubbed. Old pipes, channel lining, underground structures, vegetation, and debris, or waste should be removed if found along the storm drain alignment and disposed of at a legal dumpsite. Obstructions that extend below finish grade, if present, should be removed and resulting voids filled with compacted soil.

If the storm drain is to be installed near or beneath the foundation of an existing structure or utility, the existing structure or utility should be supported to reduce the potential for damage, and, if necessary, the drain pipe encased in concrete to accommodate imposed structural loads.

It may be desirable to identify structures or critical features that are very near the planned construction and to survey or document (e.g., photographs, video, official documentation, etc.) their pre-construction condition. The findings of the survey could be used to document any damage of existing improvements that might result from this work. For other facilities (e.g., churches, homes, etc.), where excavation-induced settlement may be a concern, baseline elevations and horizontal control data should be recorded.

9.1.2. Trench Excavations

It is our opinion that the excavation of the on-site materials can generally be accomplished to the assumed earthwork depths (up to about 18 feet deep) with heavy earthmoving equipment and specialized excavation equipment in good operating condition. However, during the excavation, there is a potential for encountering very strongly cemented soils that could require rock breaking equipment or blasting. Contractors should make their own evaluations of excavatability and plan means and methods in accordance with their evaluation as well as project specifications. Approximate velocities from seismic refraction testing are provided in Appendix C.

Depending on the excavation method used, the proposed excavations may generate oversize material (particles larger than 3 inches) that will not be suitable for reuse as trench backfill. Screening, disposal, and/or crushing of this material should be anticipated if reuse is considered.

Excavations in soils with cemented material may tend to have rugged or irregular bottoms or sidewalls. In order to provide more consisted support and grade control to the pipe, we recommend that the proposed storm drains be supported on 12 inches or more of moisture-conditioned and compacted material such as sand, gravel, or aggregate

base, with a particle size of 3/4-inch or less. If gravel or aggregate base is used for bedding material, a 4-inch layer of compacted sand should be used as a cushion between the pipe and foundation material. On-site materials with a particle size of 3/4-inch or less may be considered for pipe bedding if appropriately processed, moisture-conditioned, and compacted. Care should be exercised by the contractor to avoid damaging the corrosion protection on the CMP. Uniform pea gravel or crushed chips are not acceptable for use as foundation material. A pipe bedding detail is presented on Figure 4.

Depending on the gradation of the backfill materials used, it may be appropriate to line the trenches with a geotextile at some locations. Such locations may include wash crossings or areas prone to ponding or other standing water.

It may be difficult to place backfill against these irregular surfaces. When backfilling, care should be taken to fill voids with compacted material so that excessive settlement of the backfill will not occur.

We anticipate that the soil conditions and stability of the excavation sidewalls will vary along the storm drain alignment. Soils with higher fines content may stand vertically for a short time (less than 12 hours) with little sloughing. However, as the soil dries after excavation or as the excavations are exposed to rainfall, sloughing may occur. Soils with low cohesion (e.g., predominately sandy or gravelly material), will likely slough or cave during excavation, especially if wet or saturated. Additionally, vibrations caused by nearby traffic or construction equipment will accelerate sloughing.

The contractor should provide safely sloped excavations or an adequately constructed and braced shoring system, in compliance with Occupational Safety and Health Administration (OSHA) regulations, for employees working in excavations that may expose them to the danger of moving ground. Reducing the inclination of the sidewalls of the excavations, where feasible, may increase the stability of the excavations. If construction or earth material is stored or equipment is operated near an excavation, flatter slope geometry or stronger shoring should be used during construction. The OSHA

regulations provide trench sloping and shoring design parameters for trenches up to 20 feet deep based on the soil types encountered. Trenches over 20 feet deep should be designed by the contractor's engineer based on alignment-specific geotechnical analyses. Although cemented layers were observed, for planning purposes and according to OSHA soil classifications, a "Type C" soil should be considered due to the presence of interbedded layers of uncemented soils and the anticipated roadway vibrations. Upon making the excavations, soil classification and excavation performance should be evaluated in the field by the geotechnical consultant in accordance with the OSHA regulations. This evaluation may result in re-classifying the soil type to "Type B" in some areas. Trench side walls can be sloped at a ratio of 1.5 horizontal (H) to 1 vertical (V) for "Type C" soils and at a ratio of 1 (H) to 1(V) for "Type B" soils.

In general, temporary slopes should be inclined no steeper than 1.5 (H):1(V) up to a depth of 20 feet below the surface. Due to the diameter of the pipe and MAG specifications, temporary excavations will likely need shoring. Lateral earth pressures recommended for braced excavations are presented on Figure 3. The earth pressure values in Figure 3 were derived by assuming an internal angle of friction of 34 degrees and an average total unit weight of 110 pcf for the depth of the excavation. If construction or earth material is stored or equipment is operated near an excavation, flatter slope geometry or stronger shoring should be used during construction. Temporary excavations that encounter seepage may need shoring or may be stabilized by placing sandbags or gravel along the base of the seepage zone. Excavations encountering seepage, if any, should be evaluated on a case-by-case basis. Additional considerations regarding dewatering are provided in Section 9.1.3.

9.1.3. Construction Dewatering

Generally, we anticipate that significant groundwater will not be encountered along the proposed storm drain alignment. However, because the project excavations will be associated with existing drainage channels, the trench soils might capture surface water and become saturated and unstable. The contractor should divert surface water away from the trench or be made responsible for the design, timing, construction, operation,

maintenance, and removal of a dewatering system(s), if needed. The system should prevent migration and pumping of soil fines with the discharge water. It is anticipated that any dewatering can likely occur by pumping from the trenches or sumps located outside of, and below the limits of the main excavation.

9.1.4. Trench Widths

The minimum trench width should be the pipe diameter plus 6 inches on each side. The maximum trench widths should be the pipe diameter plus 36 inches. In general, trench widths should be in accordance with MAG Section 601. The trench width should be taken as the clear distance between trench walls or the inside face-to-face distance between the ground support systems. This distance is intended to allow space to place the CLSM using techniques that lessen the opportunity for voids to form in the pipe zone.

9.1.5. Controlled Low Strength Material

We understand that CLSM will likely be used for backfill and extend from the pipe invert to approximately the pipe's spring line. CLSM consists of a fluid, workable mixture of aggregate, Portland cement, and water. The use of CLSM has some advantages:

1. A narrower trench can be used, thereby minimizing the quantity of soil to be excavated and possibly reducing disturbance to the near-by traffic;
2. The support given to the pipe is generally better, and greater values of modulus of soil reaction (E') can be used to design the pipe;
3. Because little compaction is needed to place CLSM, there is less risk of damaging the pipe;
4. If native soils are used to formulate the CLSM, less imported material will be needed; and
5. CLSM can be batched to flow into irregularities in the trench bottom and walls.

The CLSM design mix should be in accordance with the MAG (2004) or Standard Specifications for Public Works Construction (American Public Works Association, 1991) and applicable City of Mesa specifications. Additional mix design information can be provided upon request. The 28-day strength of the material should be no less

than 50 pounds per square inch (psi) and no more than 120 psi. If on-site materials are used for the aggregate mixture, test batches may be needed to observe conformity with strength requirements. If desired, a non-cement flowable backfill (e.g., fly ash) may be considered in lieu of CLSM, but should be carefully reviewed by the geotechnical engineer and approved by the engineer of record.

Buoyant or uplift forces on the piping should be considered when using CLSM and prudent construction techniques may require multiple pours to avoid inducing excessive uplift forces. The construction methods should not allow for the storm drain pipe to displace laterally or vertically during placement of CLSM. Sufficient time should be provided to allow the CLSM to cure before placing additional lifts of CLSM or trench backfill.

9.1.6. Trench Backfill

Trench backfill material above the spring line of the storm drain (above the CLSM) should be moisture conditioned to within 2 percent of its laboratory optimum and mechanically compacted to a relative compaction of 95 percent or more as evaluated by ASTM D 698-00. The trench backfill in the upper 2-foot zone (2 feet below pavement/flatwork sections) should also be moisture conditioned to within 2 percent of its laboratory optimum; however, in this zone the material should be mechanically compacted to a relative compaction of 100 percent or more as evaluated by ASTM D 698-00.

Lift thickness for backfill will be dependent upon the type of compaction equipment utilized, but should generally be placed in uniform lifts not exceeding 8 inches in loose thickness. Special care should be exercised to avoid damaging the pipe or other structures during the compaction of the backfill. Backfilling should generally be accomplished in a manner consistent with the standards provided by MAG (2002) and applicable City of Mesa specifications and/or amendments.

Soils generated from on-site excavation activities (excluding cobbles and large diameter particles) or imported soils that exhibit very low to low expansion potential are gener-

ally suitable for use as engineered fill. Very low to low expansion potential soils are defined as having an Expansion Index (by UBC Standard No. 18-2) of 50 or less and a Plasticity Index (PI) less than 15. Laboratory tests performed on near-surface soil samples obtained from our exploratory borings indicated Expansion Index values of 2 and 0, demonstrating a very low expansion potential. Furthermore, Atterburg test results indicated PIs of 7, 6, 0, and 9. Therefore, the soils encountered along the trench alignments, as well as processed materials generated during construction, should generally be suitable for reuse as trench backfill provided they are free of organic material, clay lumps, debris, and rocks or chunks greater than 3 inches in diameter. Additionally, suitable fill should not include deleterious or organic material, clay lumps, construction debris, rock particles, and other non-soil fill materials larger than 3 inches in diameter. This material should be disposed of off-site or in non-structural areas. Some screening of the on site soils may be needed. The content of rock in the backfill greater than 1-1/2 inches in diameter should not exceed 40 percent by weight.

We recommend that additional observation, soil sampling, and possible laboratory testing be conducted during construction to evaluate the presence of any unsuitable soils not encountered in our borings. Based on our observations and laboratory testing, we estimate an earthwork (shrinkage) factor of 5 to 15 percent for the on-site soils.

Imported fill, if utilized, should consist of clean, granular material with a very low or low expansion potential. Import material in contact with ferrous metals or concrete should preferably have low corrosion potential (minimum resistivity greater than 2,000 ohm-cm, chloride content less than 25 parts per million [ppm], and soluble sulfate content of less than 0.1 percent). The geotechnical consultant should evaluate such materials and details of their placement prior to importation.

9.1.7. Soil Parameters for Pipeline Design

Based on our field observations, our experience with similar materials, and our laboratory testing, a unit weight of 125 pcf can be estimated for engineered fill derived from

on-site excavations. If import fill is used for trench backfill, a unit weight of 130 pcf may be estimated for use in design.

The modulus of soil reaction (E') is used to characterize the stiffness of the backfill placed on the sides of a buried pipe for the purpose of evaluating deflection caused by the weight of the backfill over the pipe. As mentioned previously, CLSM will be used and it is our understanding that the depth of cover will range from about 5 feet to 12 feet. We therefore recommend a general E' value of 1,800 psi.

The coefficient of friction between the soil and the pipe (or in this case the CLSM) depends upon the type of each material in the interaction. We understand that RCP will be utilized as the storm drain pipe. For planning purposes, we suggest a coefficient of friction, μ, of 0.35. The manufacturer of the pipe should be consulted for this parameter once the exact pipe material has been chosen.

9.2. Pavement Restoration

The following sections present our assumptions and recommendations for the flexible pavement sections to be restored following the storm drain installation. We understand that the affected reach of McDowell Road will not be improved (i.e., redesigned with new traffic data and pavement thicknesses), but restored. We assumed that the subgrade would be prepared according to the trench zone backfill described in Section 9.1.6.

9.2.1. Existing Pavement Section

During our field exploration activities, Ninyo & Moore advanced two pavement cores to evaluate the thickness of the roadway section. For pavement core PC-1, the AC was approximately 5.5 inches thick was underlain by about 6 inches of aggregate base (AB). For pavement core PC-2, the AC was approximately 5 inches thick which was underlain by approximately 5 inches of AB. Although some minor pavement distress was noted, a pavement evaluation was not part of this study. Based on our understanding that MCDOT was not planning on improving McDowell Road, we have assumed that the county is generally satisfied with the current pavement performance.

9.2.2. R-value

The surface soils encountered in the borings typically consisted of silty sand. Table 3 summarizes the laboratory and correlated R-values from the borings.

Table 4 – R-Value Summary

Boring No.	Sample Depth (ft.)	Correlated R-Value	Laboratory R-Value
B-1	0-5	--	72
B-5	1-2.5	64	--
B-5	0-5	--	69

9.2.3. Recommended Asphalt Pavement Sections

We recommend that the pavement sections provided in Table 4 be used for the pavement restoration associated with this project.

Table 5 – Recommended Asphalt Pavement Sections

Street	Layer	Thickness (Inches)
McDowell Road from Hawes Road to Sossaman Road	Bituminous Surface Course (MAG 12.5 mm)	3.0
	Bituminous Base Course (MAG 19 mm)	3.0
	Aggregate Base Course (MAG Section 702)	6.0

The recommended pavement thickness assumes that the above pavement section is founded on improved soil as needed, as outlined in Section 9.1.6. AB material should be compacted to a relative compaction of 100 percent or more of the maximum dry density, as evaluated by ASTM D 698-00, at a moisture content within approximately 2 percent of optimum.

9.3. Concrete Flatwork

To reduce the potential manifestation of distress to exterior concrete flatwork (such as curbs and sidewalks) due to movement of the underlying soil, we recommend that such flatwork (if utilized for this project) be installed with crack-control joints at appropriate spacing as

designed by the structural engineer. Additionally, we recommend that concrete flatwork be supported on 9 or more inches of adequately moisture-conditioned and compacted fill (in accordance with Section 9.1.6 of this report). Positive drainage should be established and maintained adjacent to flatwork.

9.4. Corrosion

The corrosion potential of the on-site materials was analyzed to evaluate its potential effect on the storm drain pipe and structures. Corrosion potential was evaluated using the results of laboratory testing of a near-surface soil sample obtained during our subsurface evaluation that was considered representative of soils at the subject site.

Laboratory testing consisted of pH, minimum electrical resistivity, and chloride and soluble sulfate contents. The pH and minimum electrical resistivity tests were performed in general accordance with Arizona Test 236b, while sulfate and chloride tests were performed in accordance with Arizona Test 733 and 736, respectively. The results of the corrosivity tests are presented in Appendix B.

The soil pH value of the near-surface sample tested from exploratory borings B-1, B-5, and B-12. The pH results are 7.7, 8.8, and 8.6 respectively, which is considered to be alkaline. The minimum electrical resistivity measured for the near-surface samples from the exploratory borings B-1, B-5, and B-12 are 4,514 ohm-cm, 2,736 ohm-cm, and 1,642 ohm-cm respectively, which represents a moderately corrosive environment to ferrous metals. The chloride content of the samples tested from exploratory borings B-1, B-5, and B-12 was measured to be 41 ppm, 10 ppm, and 40 ppm respectively, which also may be corrosive to ferrous metals. The soluble sulfate content of the soil samples for exploratory borings B-1, B-5, and B-12 were measured to be 0.010 percent, 0.001 percent, and 0.004 percent respectively, which is considered to represent negligible sulfate exposure for concrete.

The results of the laboratory testing indicate that the on-site materials are likely corrosive to ferrous metals. Therefore, special consideration should be given to the use of heavy gauge, corrosion protected steel for use if there is potential for contact (or close proximity) to soil.

9.5. Concrete

Laboratory chemical tests performed on selected samples of on-site soils indicated sulfate contents of 0.010, 0.001, and 0.004 percent by weight. Based on the following IBC table, the on-site soils should be considered to have a negligible sulfate exposure to concrete.

Table 6 – IBC Requirements for Concrete Exposed to Sulfate-Containing Soil

Sulfate Exposure	Water-Soluble Sulfate (SO_4) in Soil, Percentage by Weight	Cement Type	Maximum Water-Cementitious Materials Ratio, by Weight, Normal-Weight Aggregate Concrete[1]	Minimum f'_c, Normal-Weight and Lightweight Aggregate Concrete, psi x 0.00689 for MPa
Negligible	0.00 - 0.10	--	--	--
Moderate[2]	0.10 - 0.20	II, IP(MS), IS (MS)	0.50	4,000
Severe	0.20 - 2.00	V	0.45	4,500
Very severe	Over 2.00	V plus pozzolan[3]	0.45	4,500

[1] A lower water-cementitious materials ratio or higher strength may be required for low permeability or for protection against corrosion of embedded items or freezing and thawing (Table 19-A-2).
[2] Seawater.
[3] Pozzolan that has been determined by test or service record to improve sulfate resistance when used in concrete containing Type V cement.

Notwithstanding the sulfate test results and due to the limited number of chemical tests performed, as well as our experience with similar soil conditions and local practice, we recommend the use of Type II cement for construction of concrete structures at this site. Due to potential uncertainties as to the use of reclaimed irrigation water, or topsoil that may contain higher sulfate contents, pozzalon or admixtures designed to increase sulfate resistance may be considered.

The concrete should have a water-cementitious materials ratio no greater than 0.45 by weight for normal weight aggregate concrete. The structural engineer should select the concrete design strength based on the project specific loading conditions.

9.6. Site Drainage

Surface drainage should be provided to divert water off of paved surfaces. Surface water should also not be permitted to pond on or below pavement areas. Positive drainage is defined as a slope of 2 percent or more for a distance of 5 feet or greater away from the pavements. To deter accumulation of water below the new pavement sections, the bottom of the overexcavated zone below the new pavement should be sloped toward the edges of the roadway.

9.7. Pre-Construction Conference

We recommend that a pre-construction conference be held. Representatives of the owner, the civil engineer, the geotechnical consultant, and the contractor should be in attendance to discuss the project plans and schedule. Our office should be notified if the project description included herein is incorrect or if the project characteristics are significantly changed.

9.8. Construction Observation and Testing

During construction operations, we recommend that a qualified geotechnical consultant perform observation and testing services for the project. These services should be performed to evaluate exposed subgrade conditions, including the extent and depth of overexcavation, to evaluate the suitability of proposed borrow materials for use as fill and to observe placement and test compaction of fill soils. If another geotechnical consultant is selected to perform observation and testing services for the project, we request that the selected consultant provide a letter to the owner, with a copy to Ninyo & Moore, indicating that they fully understand our recommendations and they are in full agreement with the recommendations contained in this report. Qualified subcontractors utilizing appropriate techniques and construction materials should perform construction of the proposed improvements.

10. LIMITATIONS

The field evaluation, laboratory testing, and geotechnical analyses presented in this geotechnical report have been conducted in general accordance with current practice and the standard of care

exercised by geotechnical consultants performing similar tasks in the project area. No warranty, expressed or implied, is made regarding the conclusions, recommendations, and opinions presented in this report. There is no evaluation detailed enough to reveal every subsurface condition. Variations may exist and conditions not observed or described in this report may be encountered during construction. Uncertainties relative to subsurface conditions can be reduced through additional subsurface exploration. Additional subsurface evaluation will be performed upon request. Please also note that our evaluation was limited to assessment of the geotechnical aspects of the project, and did not include evaluation of structural issues, environmental concerns, or the presence of hazardous materials.

This document is intended to be used only in its entirety. No portion of the document, by itself, is designed to completely represent any aspect of the project described herein. Ninyo & Moore should be contacted if the reader requires additional information or has questions regarding the content, interpretations presented, or completeness of this document.

This report is intended for design purposes only. It does not provide sufficient data to prepare an accurate bid by contractors. It is suggested that the bidders and their geotechnical consultant perform an independent evaluation of the subsurface conditions in the project areas. The independent evaluations may include, but not be limited to, review of other geotechnical reports prepared for the adjacent areas, site reconnaissance, and additional exploration and laboratory testing.

Our conclusions, recommendations, and opinions are based on an analysis of the observed site conditions. If geotechnical conditions different from those described in this report are encountered, our office should be notified and additional recommendations, if warranted, will be provided upon request. It should be understood that the conditions of a site could change with time as a result of natural processes or the activities of man at the subject site or nearby sites. In addition, changes to the applicable laws, regulations, codes, and standards of practice may occur due to government action or the broadening of knowledge. The findings of this report may, therefore, be invalidated over time, in part or in whole, by changes over which Ninyo & Moore has no control.

This report is intended exclusively for use by the client. Any use or reuse of the findings, conclusions, and/or recommendations of this report by parties other than the client is undertaken at said parties' sole risk.

11. SELECTED REFERENCES

American Society for Testing and Materials (ASTM), 1997 Annual Book of ASTM Standards.

Euge, K.M., et al. I.P., 1992, Development of Seismic Acceleration Contour Maps for Arizona: Arizona Department of Transportation Report No. AZ 92-344, dated September.

International Conference of Building Officials, 2003, International Building Code: Whittier California.

Landiscor, 1999, Real Estate Photo Book for the Greater Phoenix Area.

Maricopa Association of Governments, 1998, Uniform Standard Specifications and Details for Public Works Construction.

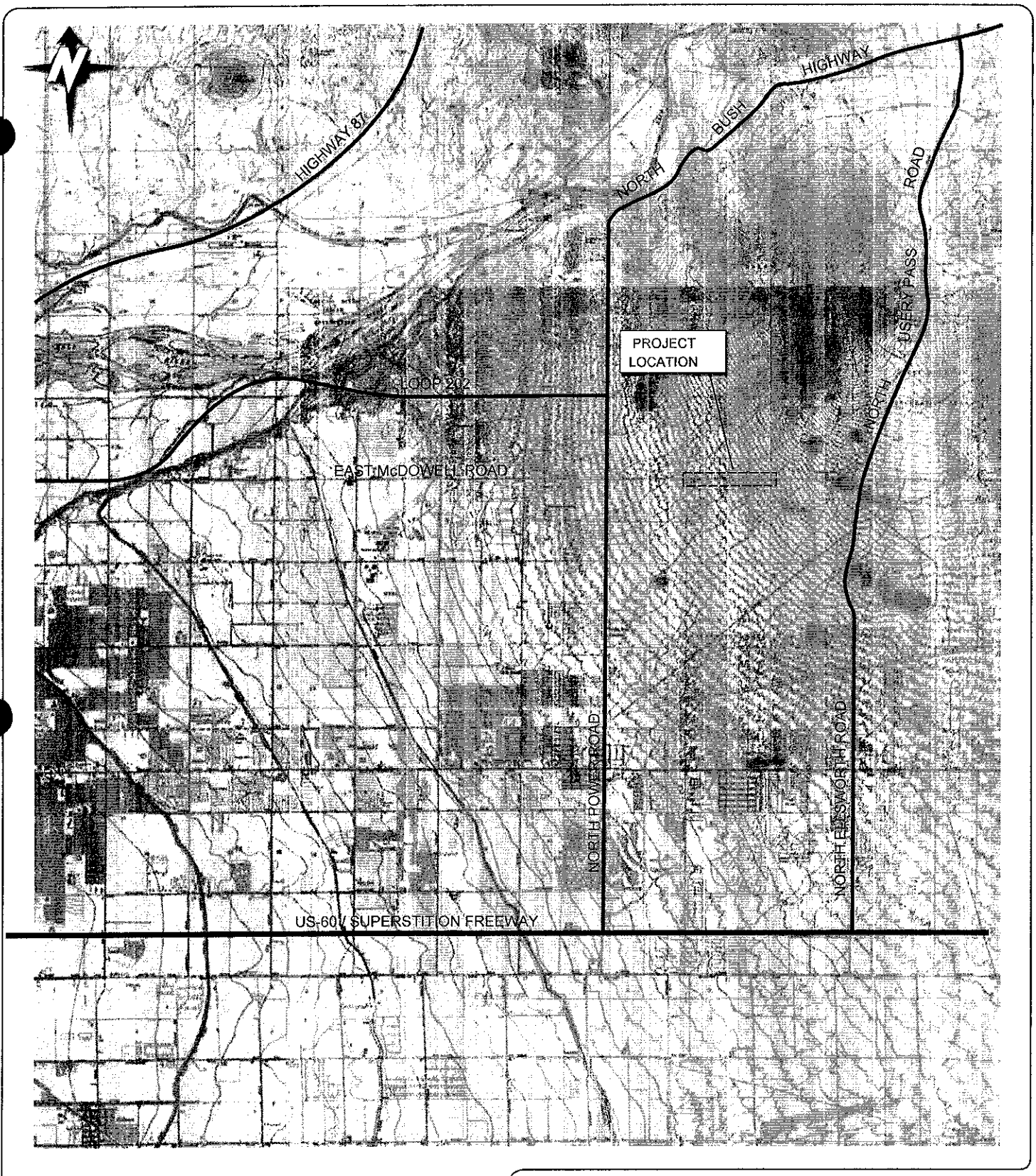
Ninyo & Moore, In-house proprietary information.

Pearthree, P.A., 1998, Quaternary Fault Data and Map for Arizona: Arizona Geological Survey, Open-File Report 98-24, 122 p.

Schumann, H.H. and Genualdi, R., 1986, Land Subsidence, Earth Fissures, and Water level Changes in Southern Arizona: Arizona Geological Survey OFR 86-14, Scale 1:500,000.

United States Department of Agriculture, 1974, Eastern-Maricopa County and Northern Pinal Counties Area, Arizona.

United States Geological Survey, 1999, National Seismic Hazard Mapping Project, World Wide Web, http://geohazards.cr.usgs.gov/eq.



0 8300

Approximate Scale:
1: 100,000
1 inch = 8300 feet

SOURCE: U.S. Geologic Service 7.5 minute topographic map, East Mesa, Arizona.

Ninyo & Moore	PROJECT LOCATION MAP		
McDOWELL ROAD BASIN AND STORM DRAIN MESA, ARIZONA			FIGURE
PROJECT No: 601052001	FILE No: 1052vmap1005	DATE: 01/06	1

LEGEND

B-13	⊕	Hollow-Stem Auger Boring Location
C-2	⊕	Pavement Core Location
L-5	⊢	Seismic Line and Test Trench Location
B-2A	⊞	Sonic Boring Location

0 1000

Approximate Scale:
1 inch = 1000 feet

SOURCE: Maricopa County Assessor's GIS Dept, 2005.I

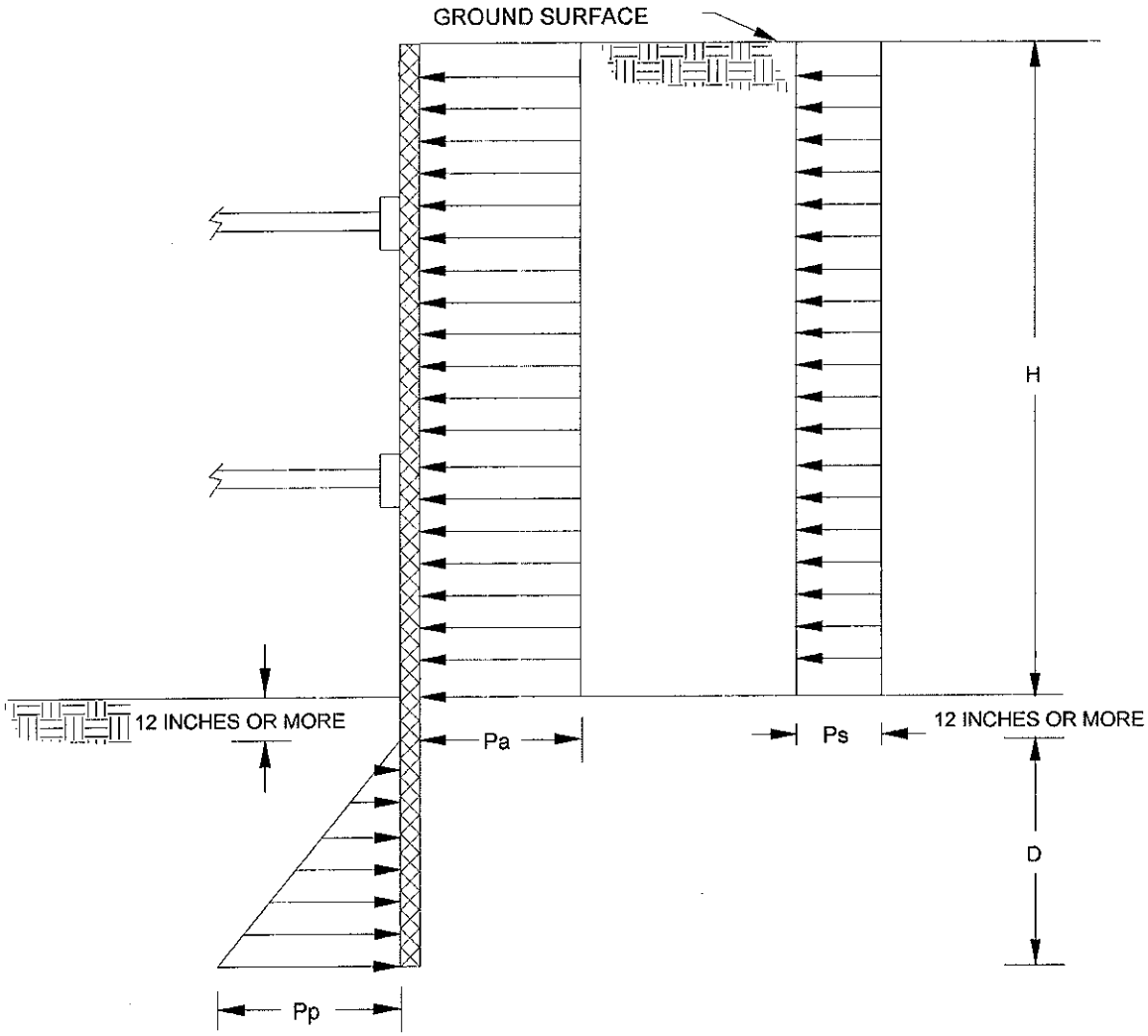
Ninyo & Moore

EXPLORATION LOCATION MAP

McDOWELL ROAD BASIN AND STORM DRAIN DESIGN
MESA, ARIZONA

FIGURE 2

PROJECT No:	FILE No:	DATE:
601052001	1052blm0905	01/06



1. APPARENT LATERAL EARTH PRESSURE, Pa

   Pa = 20 H psf

2. CONSTRUCTION TRAFFIC INDUCED SURCHARGE PRESSURE, Ps

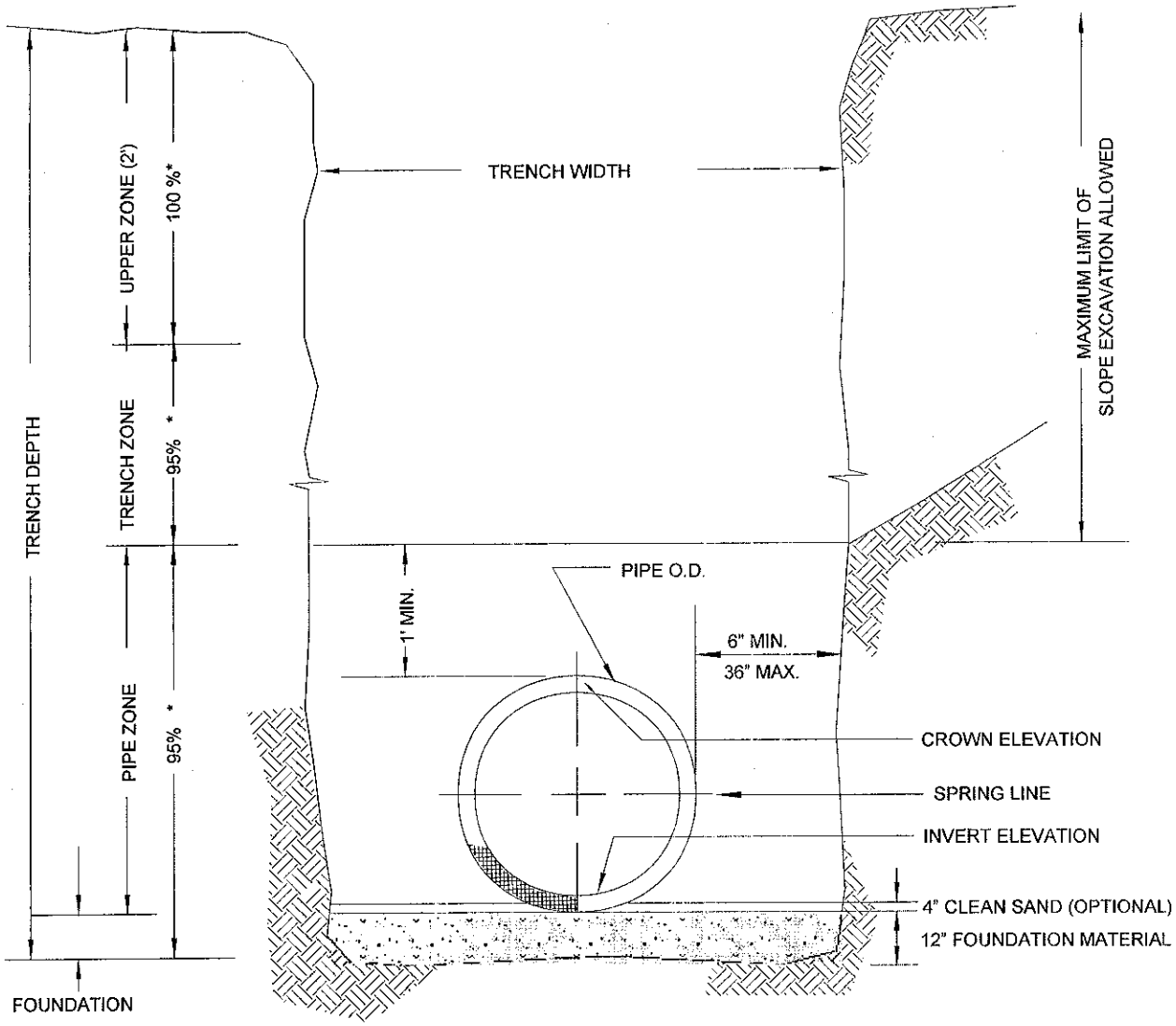
   Ps = 120 psf

3. PASSIVE LATERAL EARTH PRESSURE, Pp

   Pp = 380 D psf

4. ASSUMES GROUNDWATER NOT PRESENT
5. SURCHARGES FROM EXCAVATED SOIL OR CONSTRUCTION MATERIALS ARE NOT INCLUDED
6. H AND D ARE IN FEET

Ninyo & Moore	LATERAL EARTH PRESSURES FOR BRACED EXCAVATION		
McDOWELL ROAD BASIN AND STORM DRAIN DESIGN MESA, ARIZONA			FIGURE
PROJECT No: 601052001	FILE No: 1052lepdtl0905	DATE: 01/06	3



SECTION

NOTE

* Indicates minimum relative compaction (see report for details).

Upper zone required for pavement areas only.

Diagram not drawn to scale.

NOT TO SCALE

Ninyo & Moore	PIPE BEDDING DETAIL		
McDOWELL ROAD BASIN AND STORM DRAIN DESIGN MESA, ARIZONA			FIGURE
PROJECT No: 601052001	FILE No: 1052pipedetial	DATE: 01/06	4

APPENDIX A

BORING AND TEST TRENCH LOGS

Field Procedure for the Collection of Disturbed Samples
Disturbed soil samples were obtained in the field using the following methods.

Bulk Samples
Bulk samples of representative earth materials were obtained from the exploratory borings. The samples were bagged and transported to the laboratory for testing.

The Standard Penetration Test Spoon
Disturbed drive samples of earth materials were obtained by means of a Standard Penetration Test spoon sampler. The sampler is composed of a split barrel with an external diameter of 2 inches and an unlined internal diameter of 1-3/8 inches. The spoon was driven up to 18 inches into the ground with a 140-pound hammer free-falling from a height of 30 inches in general accordance with ASTM D 1586-84. The blow counts were recorded for every 6 inches of penetration; the blow counts reported on the logs are those for the last 12 inches of penetration. Soil samples were observed and removed from the spoon, bagged, sealed, and transported to the laboratory for testing.

Field Procedure for the Collection of Relatively Undisturbed Samples
Relatively undisturbed soil samples were obtained in the field using the following method.

The Modified Split-Barrel Drive Sampler
The sampler, with an external diameter of 3.0 inches, was lined with 1-inch long, thin brass rings with inside diameters of approximately 2.4 inches. The sample barrel was driven into the ground with a 140-pound hammer free-falling from a height of 30 inches in general accordance with ASTM D 1586-84. The samples were removed from the sample barrel in the brass rings, sealed, and transported to the laboratory for testing.

Chunk Samples
Chunk samples consisting of coherent blocks of relatively undisturbed material were collected from the excavations. These samples were sealed tightly in plastic bags and transported to the laboratory for testing.

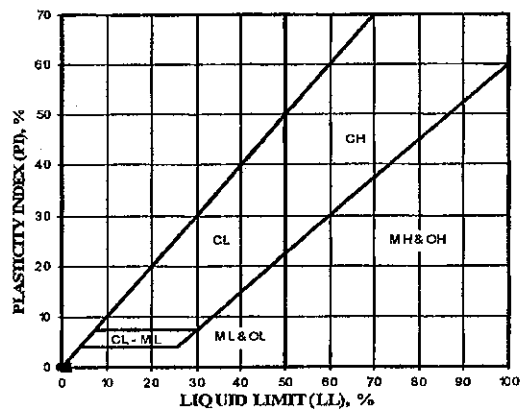
U.S.C.S. METHOD OF SOIL CLASSIFICATION

MAJOR DIVISIONS		SYMBOL	TYPICAL NAMES
COARSE-GRAINED SOILS (More than 1/2 of soil >No. 200 sieve size)	GRAVELS (More than 1/2 of coarse fraction > No. 4 sieve size)	GW	Well graded gravels or gravel-sand mixtures, little or no fines
		GP	Poorly graded gravels or gravel-sand mixtures, little or no fines
		GM	Silty gravels, gravel-sand-silt mixtures
		GC	Clayey gravels, gravel-sand-clay mixtures
	SANDS (More than 1/2 of coarse fraction <No. 4 sieve size)	SW	Well graded sands or gravelly sands, little or no fines
		SP	Poorly graded sands or gravelly sands, little or no fines
		SM	Silty sands, sand-silt mixtures
		SC	Clayey sands, sand-clay mixtures
FINE-GRAINED SOILS (More than 1/2 of soil <No. 200 sieve size)	SILTS & CLAYS Liquid Limit <50	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with
		CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean
		OL	Organic silts and organic silty clays of low plasticity
	SILTS & CLAYS Liquid Limit >50	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts
		CH	Inorganic clays of high plasticity, fat clays
		OH	Organic clays of medium to high plasticity, organic silty clays, organic silts
HIGHLY ORGANIC SOILS		Pt	Peat and other highly organic soils

GRAIN SIZE CHART

CLASSIFICATION	RANGE OF GRAIN SIZE	
	U.S. Standard Sieve Size	Grain Size in Millimeters
BOULDERS	Above 12"	Above 305
COBBLES	12" to 3"	305 to 76.2
GRAVEL Coarse Fine	3" to No. 4 3" to 3/4" 3/4" to No. 4	76.2 to 4.76 76.2 to 19.1 19.1 to 4.76
SAND Coarse Medium Fine	No. 4 to No. 200 No. 4 to No. 10 No. 10 to No. 40 No. 40 to No. 200	4.76 to 0.075 4.76 to 2.00 2.00 to 0.420 0.420 to 0.075
SILT & CLAY	Below No. 200	Below 0.075

PLASTICITY CHART



Ninyo & Moore

U.S.C.S. METHOD OF SOIL CLASSIFICATION

BORING LOG EXPLANATION SHEET

DEPTH (feet)	SAMPLES: Bulk	SAMPLES: Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	
0	■							Bulk sample.
		■						Modified split-barrel drive sampler.
		☒						No recovery with modified split-barrel drive sampler.
		▬						Sample retained by others.
		◥						Standard Penetration Test (SPT).
5		◢						No recovery with a SPT.
		▯	XX/XX					Shelby tube sample. Distance pushed in inches/length of sample recovered in inches.
		◢						No recovery with Shelby tube sampler.
		▤						Continuous Push Sample.
				♀				Seepage.
10				▽				Groundwater encountered during drilling.
				▼				Groundwater measured after drilling.
						▦	SM	ALLUVIUM: Solid line denotes unit change.
								Dashed line denotes material change.
15								Attitudes: Strike/Dip b: Bedding c: Contact j: Joint f: Fracture F: Fault cs: Clay Seam s: Shear bss: Basal Slide Surface sf: Shear Fracture sz: Shear Zone sbs: Sheared Bedding Surface
20								The total depth line is a solid line that is drawn at the bottom of the boring.

Ninyo & Moore

BORING LOG		
EXPLANATION OF BORING LOG SYMBOLS		
PROJECT NO.	DATE Rev. 01/03	FIGURE

Ninyo & Moore

Explanation of Test Pit, Core, Trench and Hand Auger Log Symbols

PROJECT NO.	DATE

EXCAVATION LOG EXPLANATION SHEET

DEPTH (FEET)	SAMPLES: Bulk	SAMPLES: Driven	SAMPLES: Sand Cone	MOISTURE (%)	DRY DENSITY (PCF)	CLASSIFICATION U.S.C.S.	
0						SM	FILL:
							Bulk sample.
						ML	Dashed line denotes material change.
							Drive sample.
1							Sand cone performed.
							Seepage
							Groundwater encountered during excavation.
							No recovery with drive sampler.
2							Groundwater encountered after excavation.
							Sample retained by others.
				xx/xx			Shelby tube sample. Distance pushed in inches/length of sample recovered in inches
3							
							No recovery with Shelby tube sampler.
						SM	ALLUVIUM:
							Solid line denotes unit change.
							Attitude: Strike/Dip
4							b: Bedding
							c: Contact
							j: Joint
							f: Fracture
							F: Fault
							cs: Clay Seam
5							s: Shear
							bss: Basal Slide Surface
							sf: Shear Fracture
							sz: Shear Zone
							sbs: Sheared Bedding Surface
							The total depth line is a solid line that is drawn at the bottom of the excavation log.

SCALE: 1 inch = 1 foot

FIGURE

Testpit explanation.xls

DATE DRILLED 08/03/05 BORING NO. B-1

GROUND ELEVATION 1766' MSL SHEET 1 OF 1

METHOD OF DRILLING CME-75, 6.5" Hollow-Stem Auger

DRIVE WEIGHT 140 lbs. (Automatic) DROP 30"

SAMPLED BY DM LOGGED BY DM REVIEWED BY ESZ

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0							SM	ALLUVIUM: Brown, damp, medium dense, silty fine to coarse SAND; few fine gravel.
			11					
			75	5.6	111.9			Very dense; scattered caliche filaments.
5								
							SP	Brown, damp, dense, fine to coarse SAND; trace silt.
			30					
10								
			50/3"				SC-SM	Brown, damp, very dense, clayey to silty fine to coarse SAND; little fine gravel.
15								
							SP	Brown, damp, very dense, fine to coarse SAND; trace gravel.
			48					
			50/6"	3.8	113.0			
								Total Depth = 19.0 feet. Groundwater not encountered. Backfilled 08/03/05.
20								

Ninyo & Moore

BORING LOG

MCDOWELL ROAD BASIN AND STORM DRAIN
SOSSAMAN ROAD TO HAWES ROAD - MESA, ARIZONA

PROJECT NO.	DATE	FIGURE
601052001	1/06	A-1

DATE DRILLED 10/07/05 BORING NO. B-1A

GROUND ELEVATION -- SHEET 1 OF 1

METHOD OF DRILLING Mini-sonic

DRIVE WEIGHT 140 lbs. (Automatic) DROP 30"

SAMPLED BY ESZ LOGGED BY ESZ REVIEWED BY ESZ

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0							SM	ALLUVIUM: Brown, damp, medium dense, silty fine to coarse SAND; little gravel; weakly cemented by caliche.
		■	110					Light brown; very dense; few clay; moderately to strongly cemented by caliche.
5								
							SC	Light brown, damp, very dense, clayey fine to coarse SAND; low to medium plasticity; few fine to coarse gravel; moderately to strongly cemented by caliche.
10								Brown; cementation not observed; scattered caliche filaments.
	■							Increase in plasticity; moderately to strongly cemented by caliche.
15								
	■	■	50/3"					Decrease in plasticity.
20								Total depth = 19.3 feet. Groundwater not encountered. Backfilled on 10/07/05.

Ninyo & Moore

BORING LOG

MCDOWELL ROAD BASIN AND STORM DRAIN
SOSSAMAN ROAD TO HAWES ROAD - MESA, ARIZONA

PROJECT NO.	DATE	FIGURE
601052001	1/06	A-14

DATE DRILLED 08/03/05 BORING NO. B-2

GROUND ELEVATION 1766' MSL SHEET 1 OF 1

METHOD OF DRILLING CME-75, 6.5" Hollow-Stem Auger

DRIVE WEIGHT 140 lbs. (Automatic) DROP 30"

SAMPLED BY DM LOGGED BY DM REVIEWED BY ESZ

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0							SP	ALLUVIUM: Brown, damp, very dense, gravelly fine to coarse SAND.
		■	82					
								Difficult drilling; coarse gravel; cobbles and possible boulders.
5								Total Depth = 4.5 feet. (Refusal) Groundwater not encountered. Backfilled 08/03/05.
10								
15								
20								

Ninyo & Moore

BORING LOG

MCDOWELL ROAD BASIN AND STORM DRAIN
SOSSAMAN ROAD TO HAWES ROAD - MESA, ARIZONA

PROJECT NO.	DATE	FIGURE
601052001	1/06	A-2

DATE DRILLED 10/07/05 BORING NO. B-2A

GROUND ELEVATION -- SHEET 1 OF 2

METHOD OF DRILLING Mini-sonic

DRIVE WEIGHT 140 lbs. (Automatic) DROP 30"

SAMPLED BY JRD LOGGED BY JRD REVIEWED BY ESZ

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0							SM	ALLUVIUM: Brown, damp, medium dense, silty fine to coarse SAND; to little gravel.
								Light brown; very dense; weakly to moderately cemented.
5								
							SC	Light grayish brown, damp, very dense, clayey fine to coarse SAND; low to medium plasticity; few fine gravel; weakly to moderately cemented.
10								Reddish brown; moderately to strongly cemented.
15								Weakly to moderately cemented by caliche.
							SM	Light brown, damp, very dense, silty fine to coarse SAND.
							SC	Light brown, damp, medium dense, clayey fine to medium SAND; weak to moderately cemented caliche.
20			50/5"					Very dense.

Ninyo & Moore

BORING LOG

MCDOWELL ROAD BASIN AND STORM DRAIN
SOSSAMAN ROAD TO HAWES ROAD - MESA, ARIZONA

PROJECT NO.	DATE	FIGURE
601052001	1/06	A-15

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
20								Total depth = 20.0 feet. Groundwater not encountered. Backfilled on 10/07/05.
25								
30								
35								
40								

DATE DRILLED 10/07/05 BORING NO. B-2A

GROUND ELEVATION -- SHEET 2 OF 2

METHOD OF DRILLING Mini-sonic

DRIVE WEIGHT 140 lbs. (Automatic) DROP 30"

SAMPLED BY JRD LOGGED BY JRD REVIEWED BY ESZ

Ninyo & Moore

BORING LOG

MCDOWELL ROAD BASIN AND STORM DRAIN
SOSSAMAN ROAD TO HAWES ROAD - MESA, ARIZONA

PROJECT NO.	DATE	FIGURE
601052001	1/06	A-16

DATE DRILLED 08/03/05 BORING NO. B-3

GROUND ELEVATION 1746' MSL SHEET 1 OF 1

METHOD OF DRILLING CME-75, 6.5" Hollow-Stem Auger

DRIVE WEIGHT 140 lbs. (Automatic) DROP 30"

SAMPLED BY DM LOGGED BY DM REVIEWED BY ESZ

DEPTH (feet)	SAMPLES (Bulk / Driven)	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0						SM	ALLUVIUM: Brown, damp, medium dense, silty fine to coarse SAND; trace fine gravel.
		25					
		28					Dense.
5							
		50/6"					Very dense; scattered caliche filaments.
10							
		50/2"					Few fine to coarse gravel.
15							Cobbles and possible boulders.
							Total Depth = 16.0 feet. (Refusal) Groundwater not encountered. Backfilled 08/03/05.
20							

Ninyo & Moore

BORING LOG

MCDOWELL ROAD BASIN AND STORM DRAIN
SOSSAMAN ROAD TO HAWES ROAD - MESA, ARIZONA

PROJECT NO.	DATE	FIGURE
601052001	1/06	A-3

DATE DRILLED 08/02/05 BORING NO. B-4

GROUND ELEVATION 1730' MSL SHEET 1 OF 1

METHOD OF DRILLING CME-75, 6.5" Hollow-Stem Auger

DRIVE WEIGHT 140 lbs. (Automatic) DROP 30"

SAMPLED BY DM LOGGED BY DM REVIEWED BY ESZ

DEPTH (feet)	SAMPLES (Bulk / Driven)	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0						SM	ALLUVIUM: Brown, damp, very dense, silty fine to coarse SAND; few fine gravel.
	Driven	50/6"					
	Driven	50/4"	8.0	100.7			
5							
						SP	Brown, damp, medium dense, fine to coarse SAND.
	Driven	13					
10							
	Driven	50/6"	3.9	119.3			Very dense.
15							Cobbles and possible boulders.
							Total Depth = 16.0 feet. (Refusal) Groundwater not encountered. Backfilled 08/02/05.
20							

Ninyo & Moore

BORING LOG

MCDOWELL ROAD BASIN AND STORM DRAIN
SOSSAMAN ROAD TO HAWES ROAD - MESA, ARIZONA

PROJECT NO.	DATE	FIGURE
601052001	1/06	A-4

DATE DRILLED 08/02/05 BORING NO. B-5

GROUND ELEVATION 1718' MSL SHEET 1 OF 1

METHOD OF DRILLING CME-75, 6.5" Hollow-Stem Auger

DRIVE WEIGHT 140 lbs. (Automatic) DROP 30"

SAMPLED BY DM LOGGED BY DM REVIEWED BY ESZ

DEPTH (feet)	SAMPLES (Bulk / Driven)	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0						SM	ALLUVIUM: Brown, damp, very dense, silty fine to coarse SAND with gravel.
		50/6"					
		50/4"					
5							
						SP	Brown, damp, dense, fine to coarse SAND; few gravel.
		59	3.6	126.1			
10							
		50/6"					Very dense.
15							
							Cobbles and possible boulders.
							Total depth = 16.0 feet. (Refusal) Groundwater not encountered. Backfilled on 08/02/05.
20							

Ninyo & Moore

BORING LOG

MCDOWELL ROAD BASIN AND STORM DRAIN
SOSSAMAN ROAD TO HAWES ROAD - MESA, ARIZONA

PROJECT NO.	DATE	FIGURE
601052001	1/06	A-5

DATE DRILLED 08/03/05 BORING NO. B-6

GROUND ELEVATION 1708' MSL SHEET 1 OF 1

METHOD OF DRILLING CME-75, 6.5" Hollow-Stem Auger

DRIVE WEIGHT 140 lbs. (Automatic) DROP 30"

SAMPLED BY DM LOGGED BY DM REVIEWED BY ESZ

DEPTH (feet)	SAMPLES (Bulk / Driven)	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0							ASPHALT CONCRETE: Approximately 6" thick.
						SM	FILL: Brown, damp, dense, silty fine to coarse SAND; few gravel.
		24				SM	ALLUVIUM: Brown, damp, dense, silty fine to coarse SAND; few gravel; scattered caliche filaments.
		50/5"					Very dense.
5							
		50/5"					
10							
		50/5"	5.4	106.0			
15							
							Cobbles and possible boulders.
							Total depth = 16.0 feet. (Refusal) Groundwater not encountered. Backfilled on 08/03/05.
20							

Ninyo & Moore

BORING LOG

MCDOWELL ROAD BASIN AND STORM DRAIN
SOSSAMAN ROAD TO HAWES ROAD - MESA, ARIZONA

PROJECT NO.	DATE	FIGURE
601052001	1/06	A-6

DATE DRILLED 08/02/05 BORING NO. B-7

GROUND ELEVATION 1679' MSL SHEET 1 OF 1

METHOD OF DRILLING CME-75, 6.5" Hollow-Stem Auger

DRIVE WEIGHT 140 lbs. (Automatic) DROP 30"

SAMPLED BY DM LOGGED BY DM REVIEWED BY ESZ

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0							SM	ALLUVIUM: Brown, damp, very dense, silty fine to coarse SAND; trace fine gravel.
		▲	50/5"					
		■	50/5"	4.9	107.2			
5								
								Cobbles and possible boulders.
								Total depth = 6.0 feet. (Refusal) Groundwater not encountered. Backfilled on 08/02/05.
10								
15								
20								

Ninyo & Moore

BORING LOG

MCDOWELL ROAD BASIN AND STORM DRAIN
SOSSAMAN ROAD TO HAWES ROAD - MESA, ARIZONA

PROJECT NO.	DATE	FIGURE
601052001	1/06	A-7

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0							SM	ALLUVIUM: Brown, damp, very dense, silty fine to coarse SAND; few fine to coarse gravel; scattered caliche filaments.
		■	50/5"					
		◪	50/2"					
5								Cobbles and possible boulders.
								Total depth = 6.0 feet. (Refusal) Groundwater not encountered. Backfilled on 08/02/05.
10								
15								
20								

DATE DRILLED 08/02/05 BORING NO. B-8

GROUND ELEVATION 1665' MSL SHEET 1 OF 1

METHOD OF DRILLING CME-75, 6.5" Hollow-Stem Auger

DRIVE WEIGHT 140 lbs. (Automatic) DROP 30"

SAMPLED BY DM LOGGED BY DM REVIEWED BY ESZ

Ninyo & Moore

BORING LOG

MCDOWELL ROAD BASIN AND STORM DRAIN
SOSSAMAN ROAD TO HAWES ROAD - MESA, ARIZONA

PROJECT NO.	DATE	FIGURE
601052001	1/06	A-8

DATE DRILLED 08/02/05 BORING NO. B-9

GROUND ELEVATION 1653' MSL SHEET 1 OF 1

METHOD OF DRILLING CME-75, 6.5" Hollow-Stem Auger

DRIVE WEIGHT 140 lbs. (Automatic) DROP 30"

SAMPLED BY DM LOGGED BY DM REVIEWED BY ESZ

DEPTH (feet)	SAMPLES (Bulk / Driven)	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0						SM	ALLUVIUM: Brown, damp, very dense, silty fine to coarse SAND; few fine to coarse gravel.
		48					
		50/3"	5.8	108.8			
5							
		45					Scattered caliche filaments.
10							
		50/1"					
15							
		50/3"					
20							Total depth = 18.0 feet. (Refusal) Groundwater not encountered. Backfilled on 08/02/05.

Ninyo & Moore

BORING LOG

MCDOWELL ROAD BASIN AND STORM DRAIN
SOSSAMAN ROAD TO HAWES ROAD - MESA, ARIZONA

PROJECT NO.	DATE	FIGURE
601052001	1/06	A-9

DATE DRILLED 08/02/05 BORING NO. B-10

GROUND ELEVATION 1649' MSL SHEET 1 OF 1

METHOD OF DRILLING CME-75, 6.5" Hollow-Stem Auger

DRIVE WEIGHT 140 lbs. (Automatic) DROP 30"

SAMPLED BY DM LOGGED BY DM REVIEWED BY ESZ

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0							SM	ALLUVIUM: Brown, damp, very dense, silty fine to coarse SAND; few gravel; scattered caliche filaments.
		■	50/6"	5.7	109.2			
		▼	75/10"					
5								
								Total depth = 6.0 feet. (Refusal) Groundwater not encountered. Backfilled on 08/02/05.
10								
15								
20								

Ninyo & Moore

BORING LOG

MCDOWELL ROAD BASIN AND STORM DRAIN
SOSSAMAN ROAD TO HAWES ROAD - MESA, ARIZONA

PROJECT NO.	DATE	FIGURE
601052001	1/06	A-10

DATE DRILLED 08/02/05 BORING NO. B-11

GROUND ELEVATION 1643' MSL SHEET 1 OF 1

METHOD OF DRILLING CME-75, 6.5" Hollow-Stem Auger

DRIVE WEIGHT 140 lbs. (Automatic) DROP 30"

SAMPLED BY DM LOGGED BY DM REVIEWED BY ESZ

DEPTH (feet)	SAMPLES (Bulk / Driven)	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0						SM	ALLUVIUM: Brown, damp, very dense, silty fine to coarse SAND; scattered caliche filament.
		58					
		75/11"					Few fine to coarse gravel.
5							
		50/4"					
10							
							Total depth = 11.0 feet. (Refusal) Groundwater not encountered. Backfilled on 08/02/05.
15							
20							

Ninyo & Moore

BORING LOG

MCDOWELL ROAD BASIN AND STORM DRAIN
SOSSAMAN ROAD TO HAWES ROAD - MESA, ARIZONA

PROJECT NO.	DATE	FIGURE
601052001	1/06	A-11

DATE DRILLED 08/02/05 BORING NO. B-12

GROUND ELEVATION 1645' MSL SHEET 1 OF 1

METHOD OF DRILLING CME-75, 6.5" Hollow-Stem Auger

DRIVE WEIGHT 140 lbs. (Automatic) DROP 30"

SAMPLED BY DM LOGGED BY DM REVIEWED BY ESZ

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0							SM	ALLUVIUM: Brown, damp, medium dense, silty fine to coarse SAND; few fine gravel.
			18					
			50/5"					Very dense; scattered caliche filament.
5								
			50/5"					Coarse gravel; cobbles and possible boulders.
10								Total depth = 9.5 feet. (Refusal) Groundwater not encountered. Backfilled on 08/02/05.
15								
20								

Ninyo & Moore

BORING LOG

MCDOWELL ROAD BASIN AND STORM DRAIN
SOSSAMAN ROAD TO HAWES ROAD - MESA, ARIZONA

PROJECT NO.	DATE	FIGURE
601052001	1/06	A-12

DATE DRILLED 08/03/05 BORING NO. B-13

GROUND ELEVATION 1633' MSL SHEET 1 OF 1

METHOD OF DRILLING CME-75, 6.5" Hollow-Stem Auger

DRIVE WEIGHT 140 lbs. (Automatic) DROP 30"

SAMPLED BY DM LOGGED BY DM REVIEWED BY ESZ

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0								ASPHALT CONCRETE: Approximately 6" thick.
			29				SM	FILL: Brown, damp, medium dense, silty fine to coarse SAND; few gravel.
			50/6"				SM	ALLUVIUM: Brown, damp, very dense, silty fine to coarse SAND; few gravel; scattered caliche filaments.
5								
			50/6"				SC	Brown, damp, very dense, clayey fine to coarse SAND; little fine to coarse gravel.
10								
			50/5"					Cobbles and possible boulders.
15								
								Total depth = 16.0 feet. (Refusal) Groundwater not encountered. Backfilled on 08/03/05.
20								

Ninyo & Moore

BORING LOG

MCDOWELL ROAD BASIN AND STORM DRAIN
SOSSAMAN ROAD TO HAWES ROAD - MESA, ARIZONA

PROJECT NO.	DATE	FIGURE
601052001	1/06	A-13

Ninyo & Moore

TEST PIT LOG

MCDOWELL ROAD BASIN AND STORM DRAIN
SOSSAMAN ROAD TO HAWES ROAD - MESA, ARIZONA

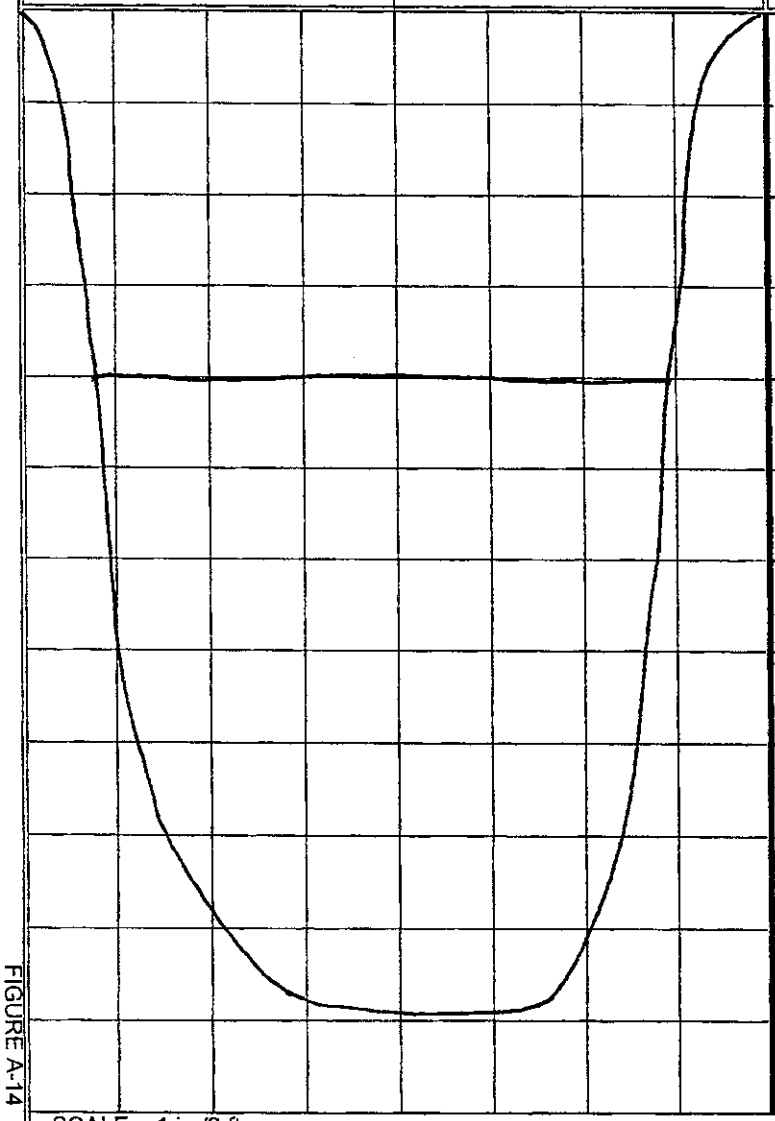
PROJECT NO.	DATE
601052001	1/06

DATE EXCAVATED 09/29/05 TEST PIT NO. L-1

GROUND ELEVATION -- LOGGED BY JSR

METHOD OF EXCAVATION Case 580 Backhoe

LOCATION South side of McDowell Road near Sossaman Road



DEPTH (FEET)	SAMPLES: Bulk	SAMPLES: Driven	SAMPLES: Sand Cone	MOISTURE (%)	DRY DENSITY (PCF)	CLASSIFICATION U.S.C.S.	DESCRIPTION
0						SC	FILL: Light brown, damp, medium dense, clayey fine to coarse SAND; low to medium plasticity; trace silt; scattered reworked caliche nodules.
2							
							Few silt.
4							Pieces of glass.
	■					SC	ALLUVIUM: Light brownish gray, damp, very dense, clayey fine to coarse SAND; low to medium plasticity; few fine to coarse gravel; trace silt; numerous caliche filaments and nodules; weakly to moderately cemented by caliche; cobbles and possible boulders.
6							
8							
10							
12							Total depth = 10.9 feet. Groundwater not encountered. Backfilled on 09/29/05.

SCALE = 1 in./2 ft.

FIGURE A-14

Ninyo & Moore

TEST PIT LOG

MCDOWELL ROAD BASIN AND STORM DRAIN
SOSSAMAN ROAD TO HAWES ROAD - MESA, ARIZONA

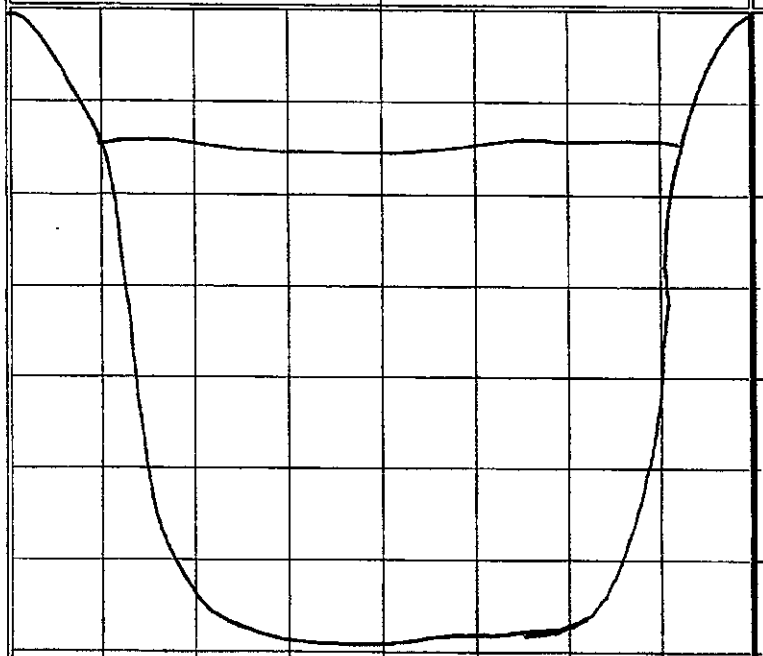
PROJECT NO.	DATE
601052001	1/06

DATE EXCAVATED 09/29/05 TEST PIT NO. L-2

GROUND ELEVATION -- LOGGED BY JSR

METHOD OF EXCAVATION Case 580 Backhoe

LOCATION South side of McDowell Road, east of 78th Street



SCALE = 1 in./2 ft.

DEPTH (FEET)	SAMPLES: Bulk	SAMPLES: Driven	SAMPLES: Sand Cone	MOISTURE (%)	DRY DENSITY (PCF)	CLASSIFICATION U.S.C.S.	DESCRIPTION
0						SC	FILL: Light brown, damp, clayey fine to coarse SAND; low to medium plasticity; few fine to coarse gravel; trace silt; numerous caliche filaments and nodules; weak to moderate cementation.
2						SC	ALLUVIUM: Light brownish gray, damp, very dense, clayey fine to coarse SAND; low to medium plasticity; few fine to coarse gravel and silt; numerous caliche filaments and nodules; weakly to moderately cemented by caliche.
4							
							Strongly cemented by caliche.
6	■						4C = 220 psi
							Refusal on caliche.
8							Total depth = 6.9 feet. (Refusal) Groundwater not encountered. Backfilled on 09/29/05.
10							
12							

FIGURE A-15

Ninyo & Moore

TEST PIT LOG

MCDOWELL ROAD BASIN AND STORM DRAIN
SOSSAMAN ROAD TO HAWES ROAD - MESA, ARIZONA

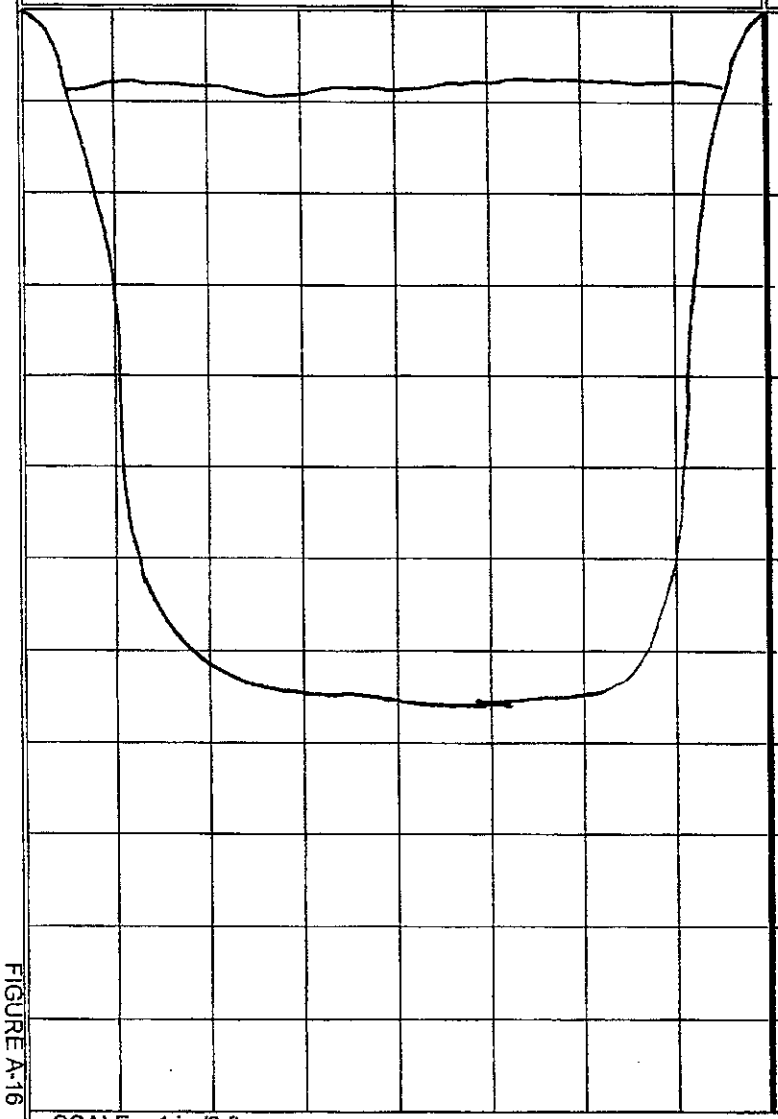
PROJECT NO.	DATE
601052001	1/06

DATE EXCAVATED 09/29/05 TEST PIT NO. L-3

GROUND ELEVATION -- LOGGED BY JSR

METHOD OF EXCAVATION Case 580 Backhoe

LOCATION South side of McDowell Road, east of 80th Street



SCALE = 1 in./2 ft.

DEPTH (FEET)	SAMPLES: Bulk	SAMPLES: Driven	SAMPLES: Sand Cone	MOISTURE (%)	DRY DENSITY (PCF)	CLASSIFICATION U.S.C.S.	DESCRIPTION
0						SM	FILL: Brown, damp, medium dense, silty fine to coarse SAND; few fine gravel; trace clay.
						SC	ALLUVIUM: Light brownish gray, damp, very dense, clayey fine to coarse SAND; low to medium plasticity; few fine gravel; trace silt; numerous caliche filaments and nodules; moderately to strongly cemented by caliche.
2							
4							
6							
							Refusal on caliche.
8							Total depth = 7.5 feet. (Refusal) Groundwater not encountered. Backfilled on 09/29/05.
10							
12							

FIGURE A-16

Ninyo & Moore

TEST PIT LOG

MCDOWELL ROAD BASIN AND STORM DRAIN
SOSSAMAN ROAD TO HAWES ROAD - MESA, ARIZONA

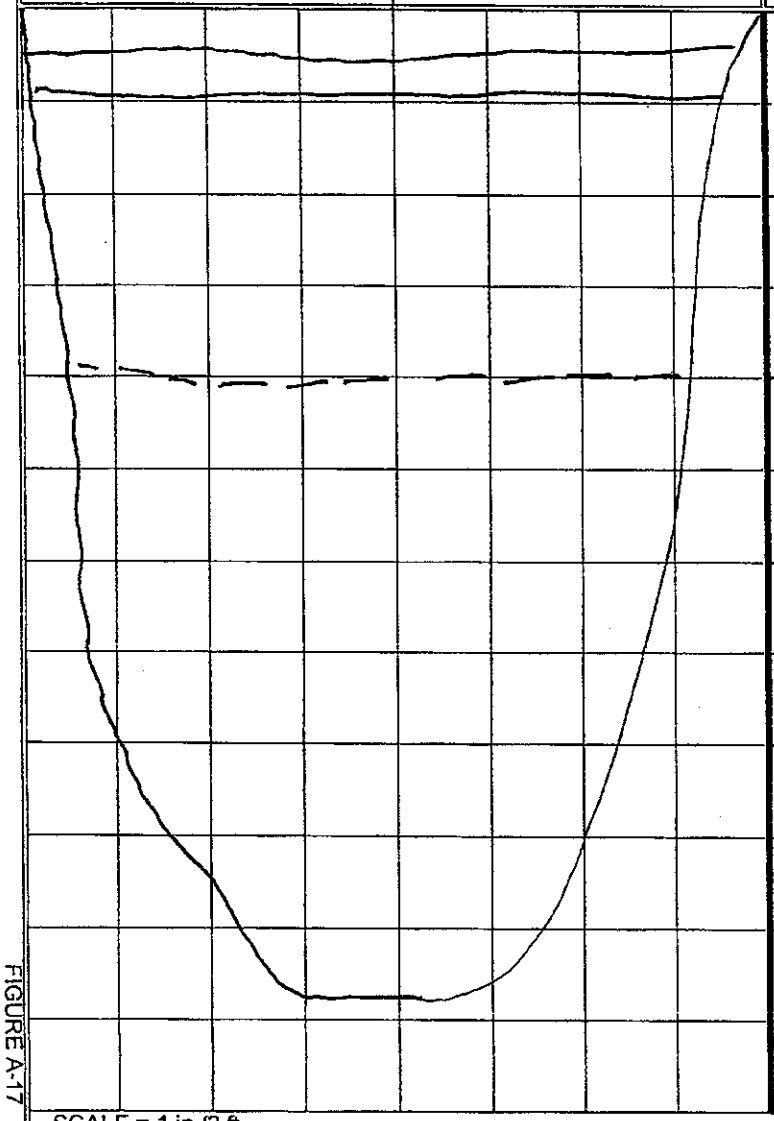
PROJECT NO.	DATE
601052001	1/06

DATE EXCAVATED 09/29/05 TEST PIT NO. L-4

GROUND ELEVATION -- LOGGED BY JSR

METHOD OF EXCAVATION Case 580 Backhoe

LOCATION South side of McDowell Road and west of Hawes Road



SCALE = 1 in./2 ft.

DEPTH (FEET)	SAMPLES: Bulk	SAMPLES: Driven	SAMPLES: Sand Cone	MOISTURE (%)	DRY DENSITY (PCF)	CLASSIFICATION U.S.C.S.	DESCRIPTION
0							ASPHALTIC CONCRETE: Approximately 5" thick.
						GP	AGGREGATE BASE: Approximately 6" thick. Brown, damp, dense, fine to coarse GRAVEL; few fine sand.
						SP	ALLUVIUM: Light brownish gray, damp, very dense, fine to coarse SAND; few fine gravel; trace silt and clay; numerous caliche filaments and nodules; moderately to strongly cemented by caliche.
2							
4						SM	Light brown, damp, very dense, silty fine to coarse SAND; few fine to coarse gravel; numerous caliche filaments and nodules; moderately to strongly cemented by caliche.
6							
8							
10							
12							Total depth = 10.9 feet. Groundwater not encountered. Backfilled on 09/29/05.

FIGURE A-17

Ninyo & Moore

TEST PIT LOG

MCDOWELL ROAD BASIN AND STORM DRAIN
SOSSAMAN ROAD TO HAWES ROAD - MESA, ARIZONA

PROJECT NO.	DATE
601052001	1/06

DATE EXCAVATED 09/29/05 TEST PIT NO. L-5

GROUND ELEVATION -- LOGGED BY JSR

METHOD OF EXCAVATION Case 580 Backhoe

LOCATION South side of McDowell Road, west of 82nd Street

DEPTH (FEET)	SAMPLES: Bulk	SAMPLES: Driven	SAMPLES: Sand Cone	MOISTURE (%)	DRY DENSITY (PCF)	CLASSIFICATION U.S.C.S.	DESCRIPTION
0						SP	FILL: Brown, damp, medium dense, gravelly fine to coarse SAND; trace silt.
						SC	ALLUVIUM: Light brownish gray, damp, clayey fine to coarse SAND; low to medium plasticity; few fine to coarse gravel; numerous caliche filaments and nodules; moderately to strongly cemented by caliche.
2							
4							
6							
						SM	Light brownish gray, damp, very dense, silty fine to coarse SAND; few fine to coarse gravel; trace clay; numerous caliche filaments and nodules; moderately to strongly cemented by caliche.
8	■						
10							
12							Total depth = 11.0 feet. Groundwater not encountered. Backfilled on 09/29/05.

SCALE = 1 in./2 ft.

FIGURE A-18

APPENDIX B

LABORATORY TEST RESULTS

Classification

Soils were visually and texturally classified in accordance with the Unified Soil Classification System (USCS) in general accordance with ASTM D 2488-93. Soil classifications are indicated on the logs of the exploratory borings in Appendix A.

In-Place Moisture and Density Tests

The moisture content and dry density of relatively undisturbed samples obtained from the exploratory borings were evaluated in general accordance with ASTM D 2937-94. The test results are presented on the logs of the exploratory borings in Appendix A.

Gradation Analysis

Gradation analysis tests were performed on selected representative soil samples in general accordance with ASTM D 422-63. The grain-size distribution curves are shown on Figures B-1 through B-4. These test results were utilized in evaluating the soil classifications in accordance with the Unified Soil Classification System.

Atterberg Limits

Tests were performed on selected representative fine-grained soil samples to evaluate the liquid limit, plastic limit, and plasticity index in general accordance with ASTM D 4318-00. These test results were utilized to evaluate the soil classification in accordance with the Unified Soil Classification System. The test results and classifications are shown on Figure B-5.

Hydroconsolidation (Settlement Potential) Tests

Hydroconsolidation tests were performed on selected relatively undisturbed soil samples in general accordance with ASTM D 4546-03. The samples were inundated during testing to represent adverse field conditions. The percent of consolidation for each load cycle was recorded as a ratio of the amount of vertical compression to the original height of the sample. The results of the tests are summarized on Figures B-6 andB-7.

Expansion Index Tests

The expansion index of selected materials was evaluated in general accordance ASTM D 4829-95. Specimens were molded under a specified compactive energy at approximately 50 percent saturation (plus or minus 1 percent). The prepared 1-inch thick by 4-inch diameter specimens were loaded with a surcharge of 144 pounds per square foot and were inundated with tap water.

Readings of volumetric swell were made for a period of 24 hours. The results of these tests are presented on Figure B-8.

Maximum Dry Density and Optimum Moisture Content Tests

The maximum dry density and optimum moisture content of selected representative soil samples were evaluated in general accordance with ASTM D 698-00. The results of these tests are summarized on Figures B-9 and B-10.

R-Value

The resistance value, or R-value, of alluvial soils was evaluated in general accordance with ASTM D 2844-94. Samples were prepared and each was tested for exudation pressure and R-value. The graphically evaluated R-value at an exudation pressure of 300 pounds per square inch is reported. The test results are shown on Figure B-11

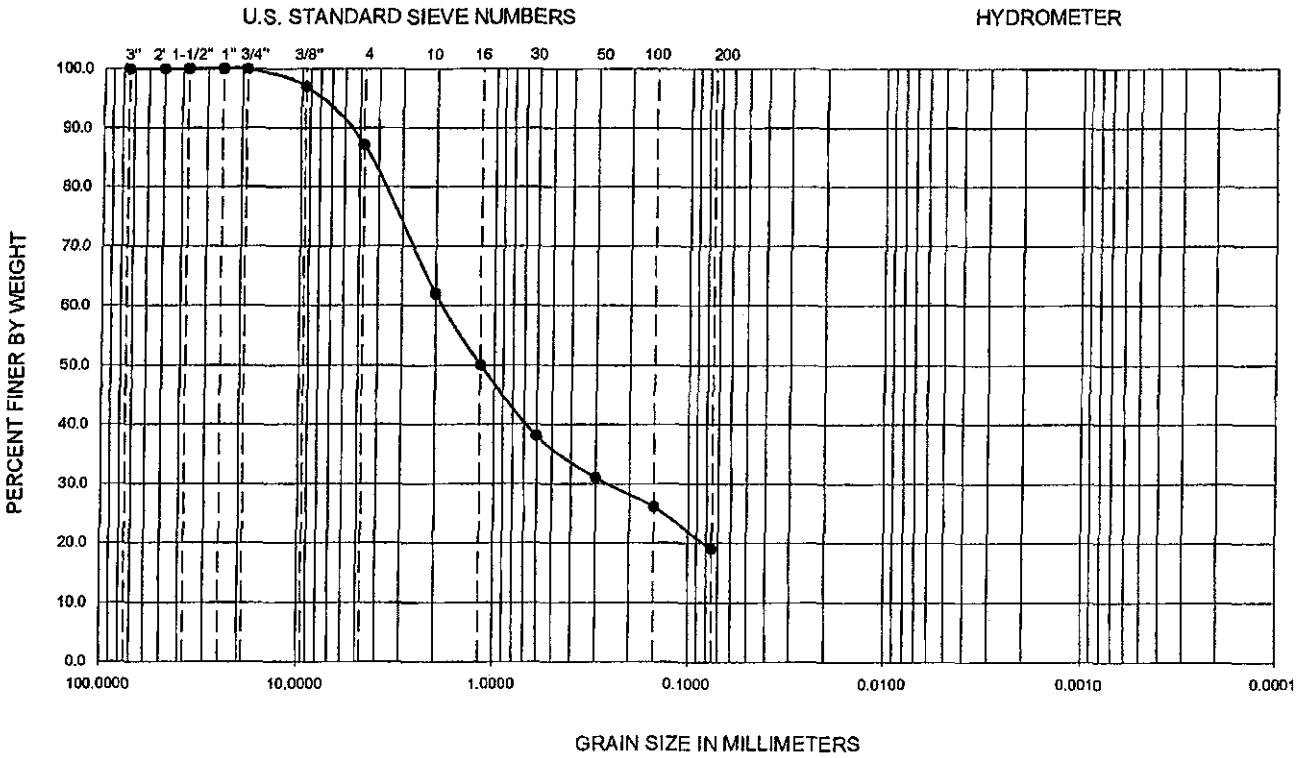
Unconfined Compression Tests

An unconfined compression tests was performed on a chunk sample in general accordance with ASTM D 2166-00. The test result is shown on the test trench log in Appendix A.

Soil Corrosivity Tests

Soil pH and minimum resistivity tests were performed on a representative soil sample in general accordance with Arizona Test 236b. The sulfate content was evaluated in general accordance with Arizona Test 733. The chloride content was evaluated in general accordance with Arizona Test 736. The test results are presented on Figure B-12.

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (%)	U.S.C.S
●	B-1	13.5-13.7	25	18	7	--	--	--	--	--	19	SC-SM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422-02

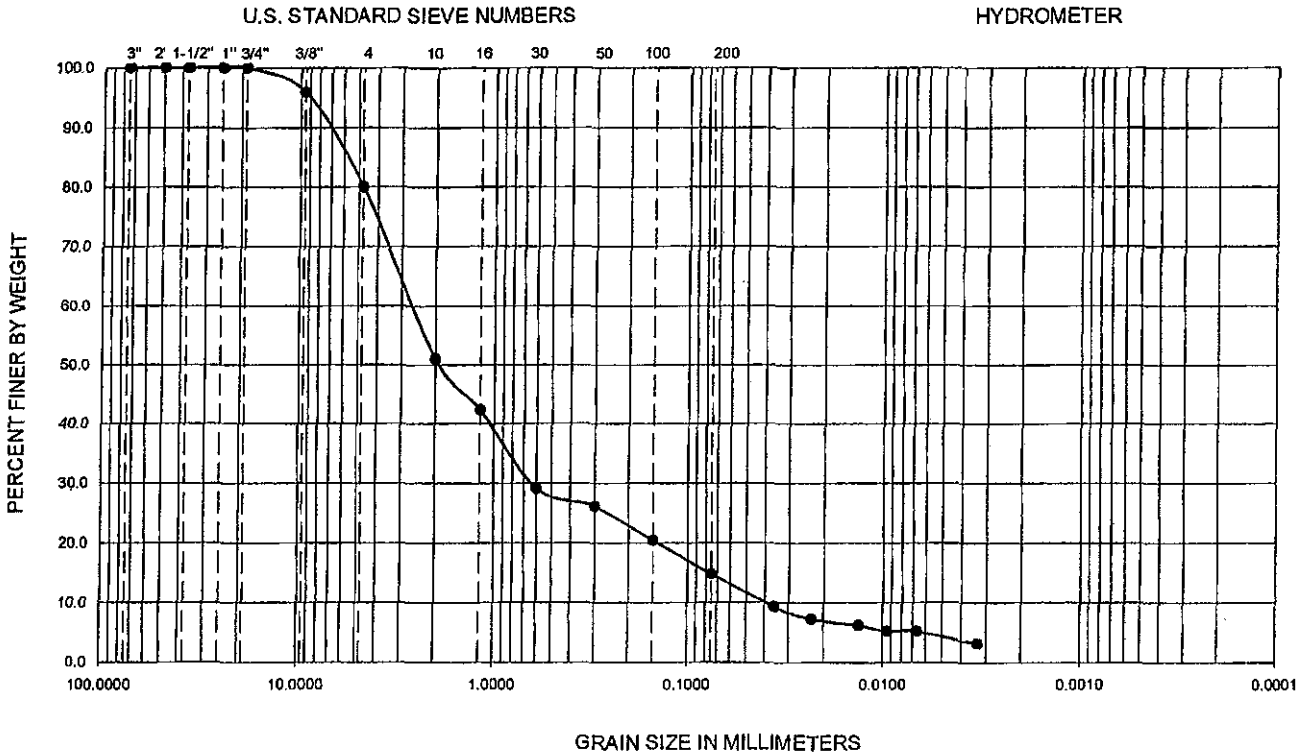
Ninyo & Moore

GRADATION TEST RESULTS

MCDOWELL ROAD BASIN & STORM DRAIN
SOSSAMEN ROAD TO HAWES ROAD
MESA, ARIZONA

PROJECT NO.	DATE	FIGURE
601052001	1/06	B-1

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (%)	U.S.C.S
●	B-5	1-1.5	38	32	6	--	--	--	--	--	14.8	SM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422-02

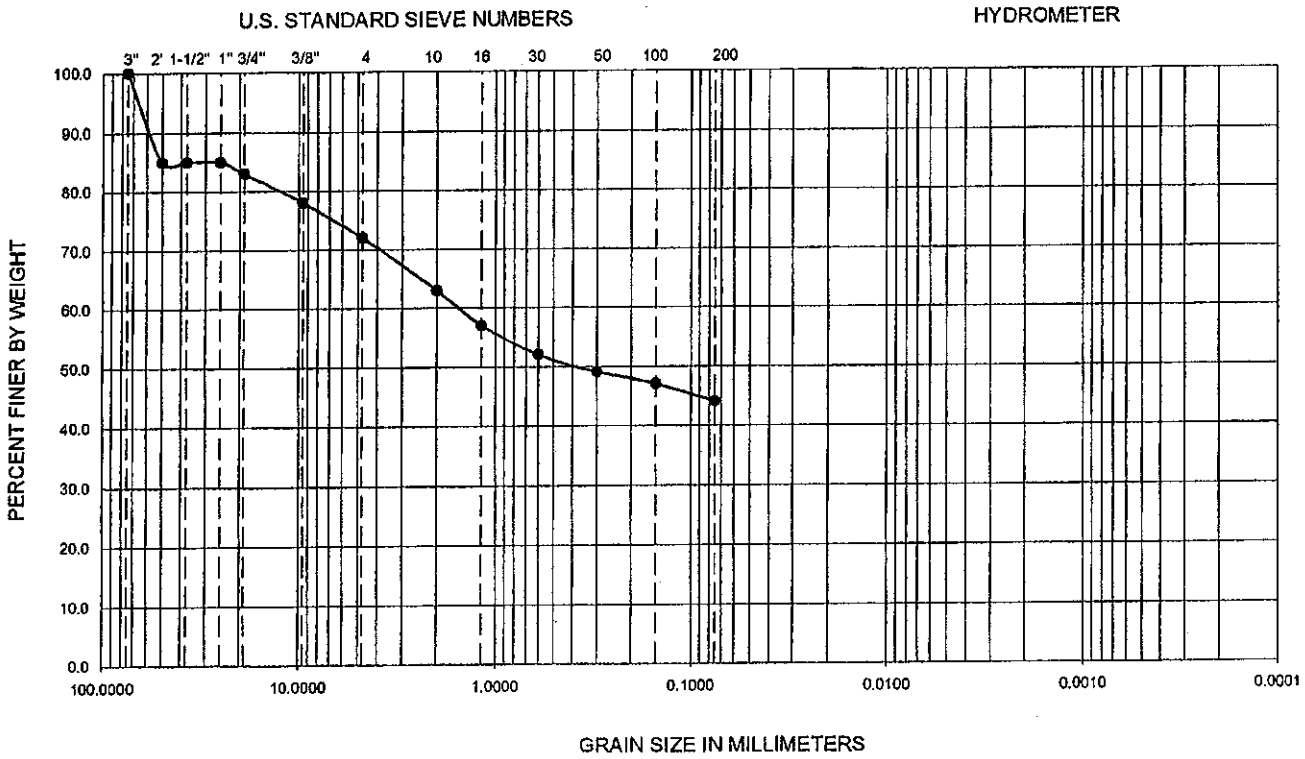
Ninyo & Moore

GRADATION TEST RESULTS

MCDOWELL ROAD BASIN & STORM DRAIN
SOSSAMEN ROAD TO HAWES ROAD
MESA, ARIZONA

PROJECT NO.	DATE	FIGURE
601052001	1/06	B-2

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (%)	U.S.C.S
●	B-9	13.5-15	NP	NP	NP	--	--	--	--	--	44	SM

NP-INDICATES NON-PLASTIC

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422-02

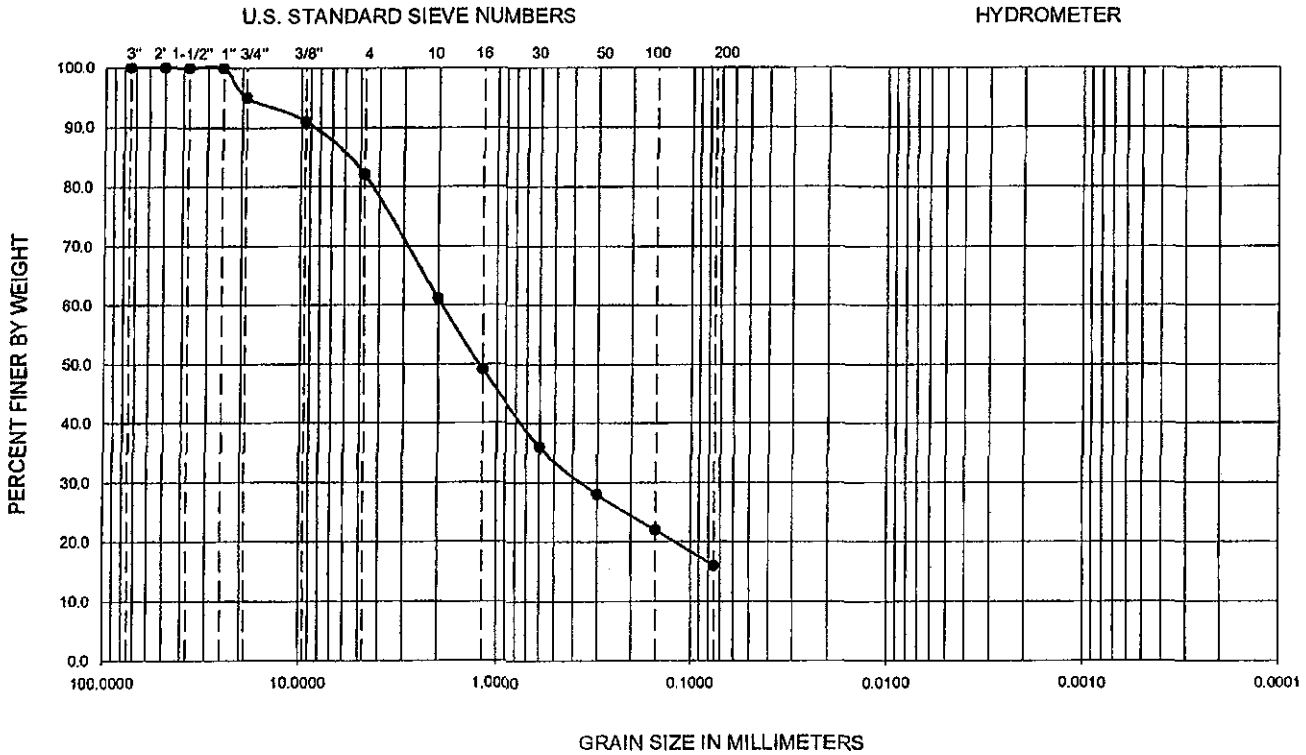
Ninyo & Moore

GRADATION TEST RESULTS

MCDOWELL ROAD BASIN & STORM DRAIN
MCDOWELL ROAD FROM SOSSAMEN TO HAWES
MESA, ARIZONA

PROJECT NO.	DATE	FIGURE
601052001	1/06	B-3

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (%)	U.S.C.S
●	B-13	8.5-9	29	20	9	--	--	--	--	--	16	SC

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422-02

Ninyo & Moore

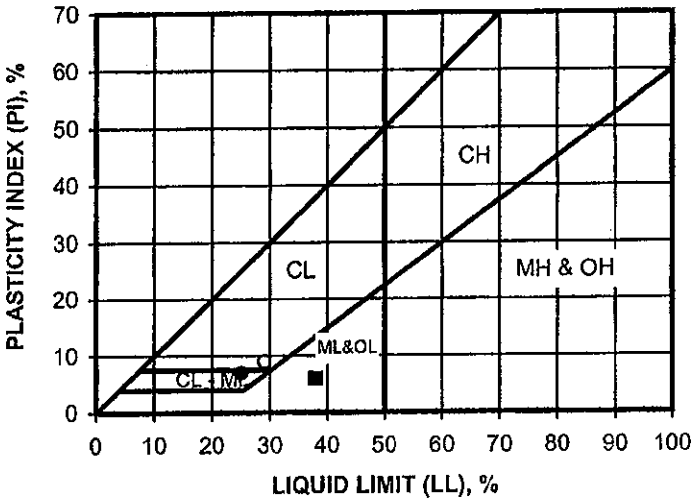
GRADATION TEST RESULTS

MCDOWELL ROAD BASIN & STORM DRAIN
SOSSAMEN ROAD TO HAWES ROAD
MESA, ARIZONA

PROJECT NO.	DATE	FIGURE
601052001	1/06	B-4

SYMBOL	LOCATION	DEPTH (FT)	LL (%)	PL (%)	PI (%)	U.S.C.S. CLASSIFICATION (Minus No. 40 Sieve Fraction)	U.S.C.S. (Entire Sample)
●	B-1	13.5-13.7	25	18	7	CL-ML	SC-SM
■	B-5	1-1.5	38	32	6	ML	SM
◆	B-9	13.5-13.6	NP	NP	NP	NP	SM
○	B-13	8.5-9	29	20	9	CL	SC

NP - INDICATES NON-PLASTIC



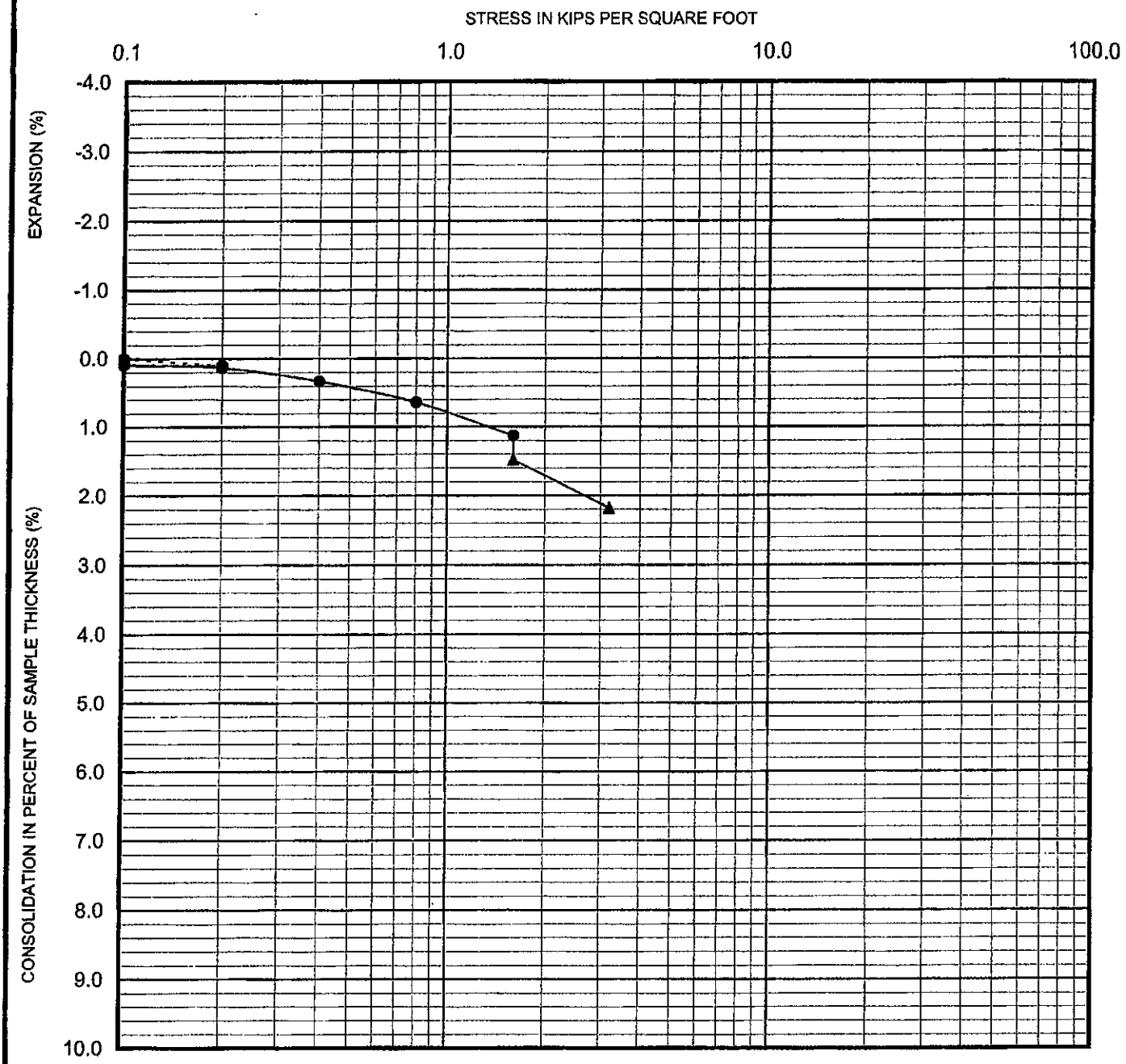
PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 4318-00

Ninyo & Moore

ATTERBERG LIMITS TEST RESULTS

MCDOWELL ROAD BASIN & STORM DRAIN
SOSSAMEN ROAD TO HAWES ROAD
MESA, ARIZONA

PROJECT NO.	DATE	FIGURE
601052001	1/06	B-5



---●---	Seating Cycle	Sample Location	B-6
—●—	Loading Prior to Inundation	Depth (ft.)	13.5-15
—▲—	Loading After Inundation	Soil Type	SM
---▲---	Rebound Cycle		

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 2435-03

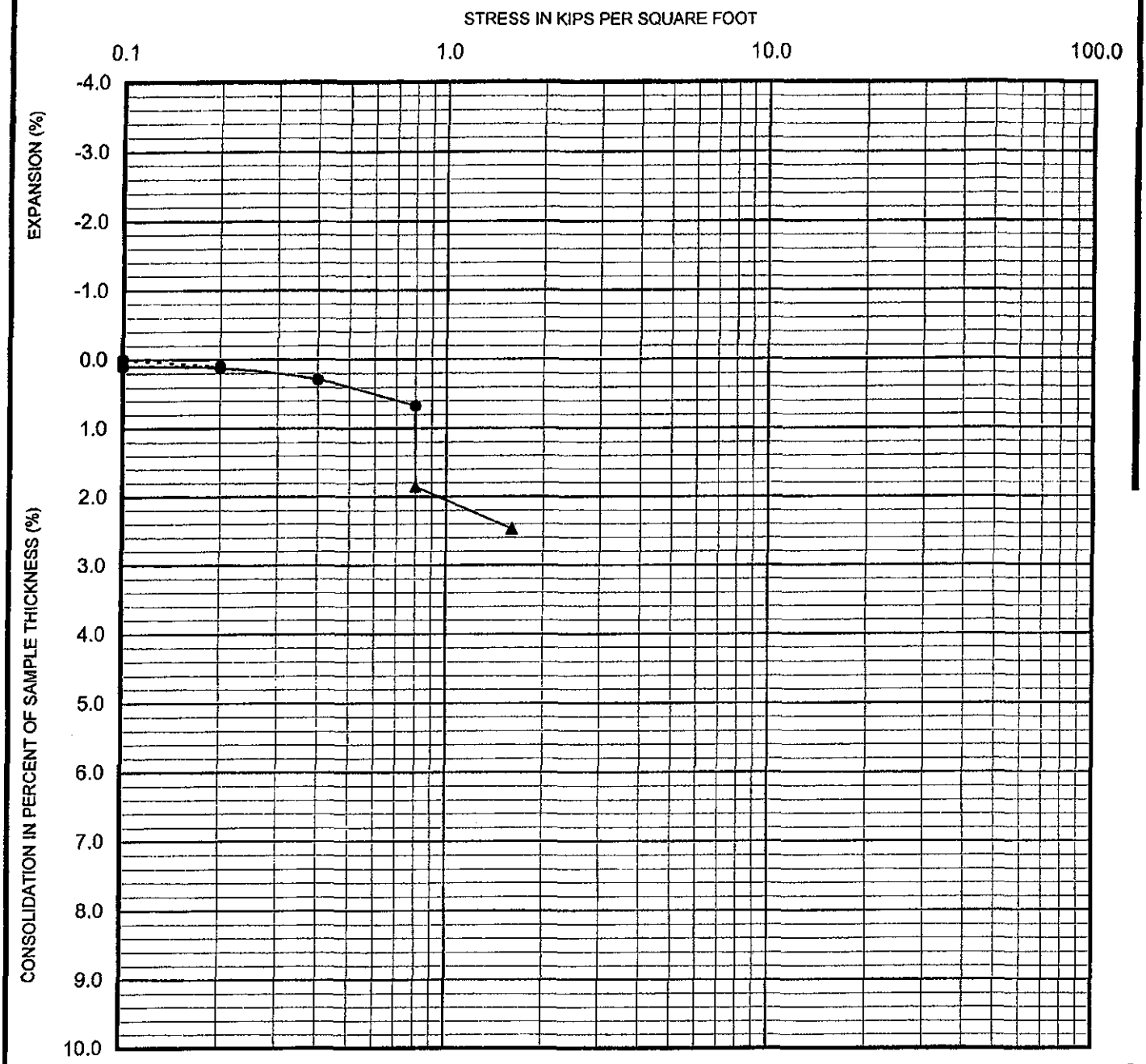
Ninyo & Moore

CONSOLIDATION TEST RESULTS

MCDOWELL ROAD BASIN & STORM DRAIN
SOSSAMEN ROAD TO HAWES ROAD
MESA, ARIZONA

PROJECT NO.	DATE	FIGURE
601052001	1/06	B-7

CONSOLIDATION B-6 13.5-15



---●---	Seating Cycle	Sample Location	B-4
—●—	Loading Prior to Inundation	Depth (ft.)	13-15
—▲—	Loading After Inundation	Soil Type	SP
---▲---	Rebound Cycle		

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 2435-03

Ninyo & Moore

CONSOLIDATION TEST RESULTS

MCDOWELL ROAD BASIN & STORM DRAIN
SOSSAMEN ROAD TO HAWES ROAD
MESA, ARIZONA

PROJECT NO.	DATE	FIGURE
601052001	1/06	B-6

CONSOLIDATION B-4 13-15

EXPANSION INDEX TEST RESULTS

SAMPLE LOCATION	SAMPLE DEPTH (FT)	INITIAL MOISTURE (%)	COMPACTED DRY DENSITY (PCF)	FINAL MOISTURE (%)	VOLUMETRIC SWELL (IN)	EXPANSION INDEX	EXPANSION POTENTIAL
B-1	0-5	7.0	124.5	9.3	-	2	Very Low
B-12	0-5	7.2	117.0	13.2	-	0	Very Low

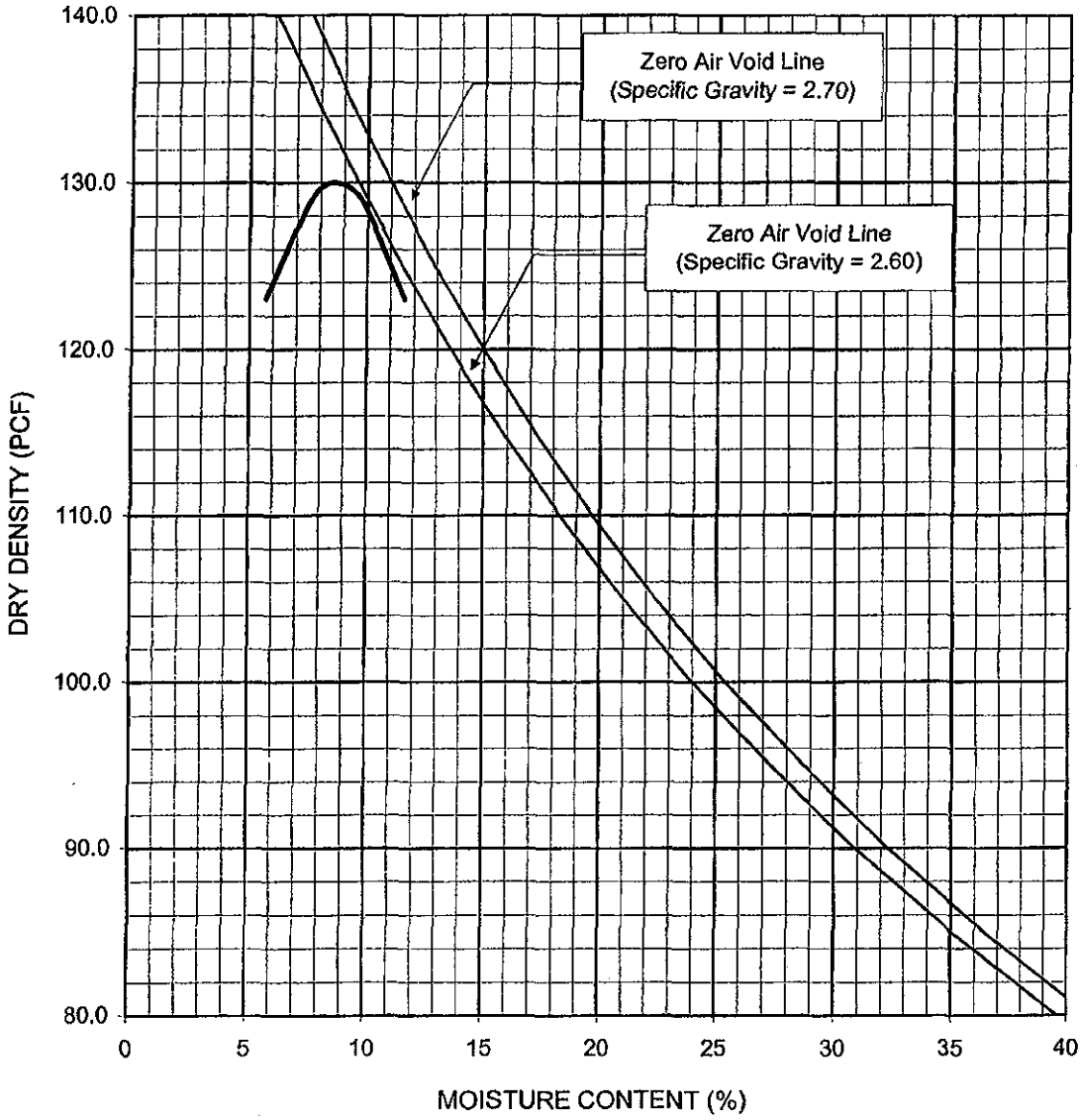
PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 4829-03

Ninyo & Moore

EXPANSION INDEX TEST RESULTS

MCDOWELL ROAD BASIN & STORM DRAIN
SOSSAMEN ROAD TO HAWES ROAD
MESA, ARIZONA

PROJECT NO.	DATE	FIGURE
601052001	1/06	B-8



Sample Location	Depth (ft)	Soil Description	Maximum Dry Density (pcf)	Optimum Moisture Content (%)
B-1	0-5	Silty Fine to Coarse SAND	130.0	8.5

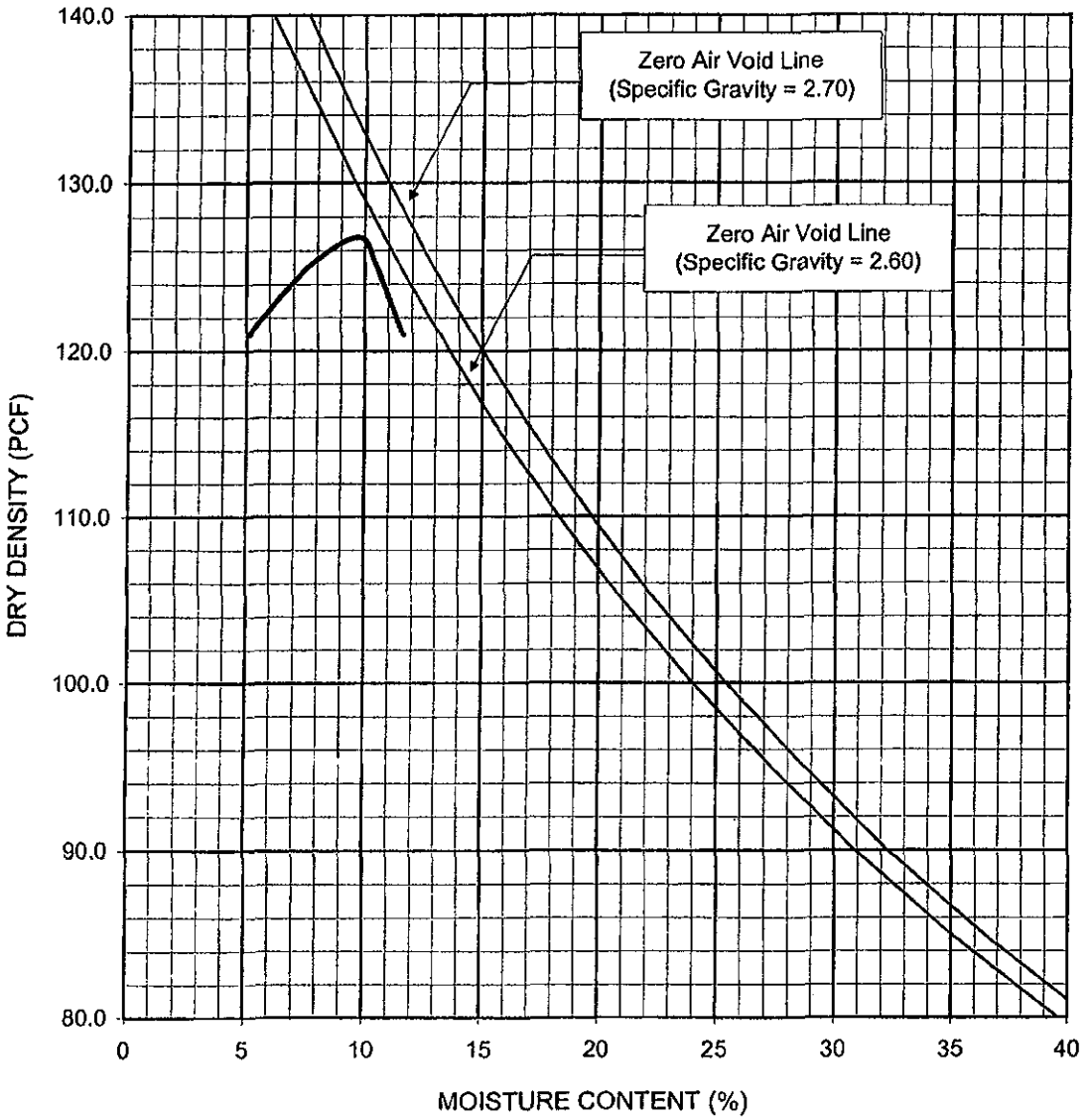
PERFORMED IN GENERAL ACCORDANCE WITH ☐ ASTM D 1557-02 ☑ ASTM D 698-00a METHOD "A"

Ninyo & Moore

PROCTOR DENSITY TEST RESULTS

MCDOWELL ROAD BASIN & STORM DRAIN
SOSSAMEN ROAD TO HAWES ROAD
MESA, ARIZONA

PROJECT NO.	DATE	FIGURE
601052001	1/06	B-9



Sample Location	Depth (ft)	Soil Description	Maximum Dry Density (pcf)	Optimum Moisture Content (%)
B-12	0-5	Silty Fine to Coarse SAND	126.8	9.7

PERFORMED IN GENERAL ACCORDANCE WITH ☐ ASTM D 1557-02 ☑ ASTM D 698-00a METHOD "A"

Ninyo & Moore

PROCTOR DENSITY TEST RESULTS

MCDOWELL ROAD BASIN & STORM DRAIN
SOSSAMEN ROAD TO HAWES ROAD
MESA, ARIZONA

PROJECT NO.	DATE	FIGURE
601052001	1/06	B-10

R-VALUE TEST RESULTS

SAMPLE LOCATION	SAMPLE DEPTH (FT)	SOIL TYPE	R-VALUE
B-1	0-5	SM	72
B-5	0-5	SM	69

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 2844-94

Ninyo & Moore

R-VALUE TEST RESULTS

MCDOWELL ROAD STORM DRAIN
SOSSAMEN ROAD TO HAWES ROAD
MESA, ARIZONA

PROJECT NO.	DATE	FIGURE
601052001	1/06	B-11

CORROSIVITY TEST RESULTS

SAMPLE ID	DEPTH (FT)	pH *	RESISTIVITY * (ohm-cm)	WATER-SOLUBLE SULFATE CONTENT IN SOIL ** (%)	CHLORIDE CONTENT *** (ppm)
B-1	0-5	7.7	4,514	0.010	41
B-5	0-5	8.8	2,736	0.001	10
B-12	0-5	8.6	1,642	0.004	40

* PERFORMED IN GENERAL ACCORDANCE WITH ADOT TEST METHOD ARIZ 236b
** PERFORMED IN GENERAL ACCORDANCE WITH ADOT TEST METHOD ARIZ 733
*** PERFORMED IN GENERAL ACCORDANCE WITH ADOT TEST METHOD ARIZ 736

Ninyo & Moore

CORROSIVITY TEST RESULTS

MCDOWELL ROAD BASIN & STORM DRAIN
SOSSAMEN ROAD TO HAWES ROAD
MESA, ARIZONA

PROJECT NO.	DATE	FIGURE
601052001	1/06	B-12

APPENDIX C

SEISMIC REFRACTION SURVEYS

APPENDIX C

SEISMIC REFRACTION SURVEYS

Ninyo and Moore personnel conducted seismic refraction surveys at the site on September 28, 2005 to evaluate the rippability characteristics of the subsurface materials. The seismic refraction data were collected with a SmartSeis S12, high performance digital exploration seismograph and 12 vertical component geophones. A 10-pound hammer and metal plate were used as the seismic wave source. A total of 5 seismic refraction traverses were performed along the south edge of McDowell Road between Sossaman Road and Hawes Road. The approximate locations of the surveys are depicted on Figure 2.

The seismic refraction method uses first-arrival times of refracted seismic waves to determine the thicknesses and seismic velocities of subsurface layers. Seismic waves generated at the surface are refracted at boundaries separating materials of contrasting velocities. These refracted seismic waves are then detected by a series of surface geophones and recorded with a seismograph. The travel times of the seismic waves are used in conjunction with the shot-to-geophone distances to obtain thickness and velocity information on the subsurface materials.

The refraction method requires that subsurface velocities (and therefore material density) increase with depth. A layer having a velocity lower than that of the layer above will not be detectable by the seismic refraction method and, therefore, could lead to errors in the depth calculations of subsequent layers. In addition, lateral variations in velocity can also result in the misinterpretation of the subsurface conditions.

In general, seismic wave velocities can be correlated to material density and/or rock hardness. The relationship between rippability and seismic velocity is empirical and assumes a homogenous mass. Localized areas of differing composition, texture, or structure may affect both the measured data and the actual rippability of the mass. The rippability of a mass is also dependent on the excavation equipment used and the skill and experience of the equipment operator.

DRAFT

The following rippability chart (Table C-1) is based on our experience with similar materials. It assumes that a Caterpillar D-9 dozer ripping with a single shank is used. We emphasize that the cutoffs in this classification scheme are approximate and that soil characteristics such as degree of cementation by caliche or carbonate can play a significant role in determining excavation rates and rippability. In addition, where excavations encounter or penetrate, weathered or fresh bedrock, rock characteristics, such as depth of and degree of weathering, and fracture spacing and orientation play a significant role in determining rock rippability. These soil and rock characteristics may also vary with location and depth.

Table C-1 - Qualitative Rippability Classification

0 to 2000 ft/s	Easy Ripping
2000 to 4000 ft/s	Moderate Ripping
4000 to 5500 ft/s	Difficult Ripping, Possible Blasting
5500 to 7000 ft/s	Very Difficult Ripping, Probable Blasting
Greater than 7000 ft/s	Blasting Generally Required

DRAFT

For trenching operations, the rippability figures should be scaled downward. For example, velocities as low as 3,500 feet per second may indicate difficult ripping during trenching operations. In addition, the presence of cobbles and boulders, which can be troublesome in a narrow trench, should be anticipated. The above classification scheme should be used with discretion, and contractors should not be relieved of making their own independent evaluation of the rippability of the on-site materials prior to submitting their bids.

Approximate layer profiles are presented in Figures C-1 through C-5, which are attached to this appendix.It should also be noted that, as a general rule of thumb, the effective depth of evaluation for a seismic refraction traverse is approximately one-third to one-fifth the length of the refraction line.

APPENDIX D

AGRONOMIC TEST RESULTS

FRUIT GROWERS LABORATORY, INC.

ANALYTICAL CHEMISTS

September 9, 2005

Lab ID : SP 0509021-001
Customer ID : 2-18569

Ninyo & Moore
5710 Ruffin Road
San Diego, CA 92123-1013

Recommendation for McDowell Road Storm Drain

The following report presents the results of analyses conducted on your soil. See page 4 for sample information and analyses results. The following recommendations are based upon the current conditions of the soil. All application recommendations are for each 1,000 square feet of growing area. Please be sure to read the standard application notes presented on page 3.

I. Plant Selection

The Analyses of this soil indicates the following plant selection requirements:

A. Select only non-acidic loving plants for this soil.
B. Select only those plants that have a high or greater tolerance to free limestone for planting at this site.
C. Select only those plants that have a moderate or greater tolerance to Salinity for planting at this site. A review of the plants growing in the immediate area of the site to be landscaped will provide some additional guidelines as to the proper plant selection.

II. Preplant Soil Amendments and Fertilizers

A. Turf and Groundcover

	Apply per 1000 sq. ft.
1. Soil Amendments	
a. Organic (Well-composted)	2.00 cu. yds.
b. Limestone	0.00 lbs.
c. Soil Sulfur	0.00 lbs.
	Apply per 1000 sq. ft.
2. Fertilizers	
a. Nitrogen (N)	0.00 lbs.
b. Phosphorus (P2O5)	3.90 lbs.
c. Potassium (K2O)	2.00 lbs.
d. Magnesium (Mg)	0.00 lbs.
e. Zinc (Zn)	0.00 lbs.
f. Manganese (Mn)	0.00 lbs.
g. Iron (Fe)	0.60 lbs.
h. Copper (Cu)	0.05 lbs.
i. Boron (B)	0.01 lbs.

Corporate Offices & Laboratory
PO Box 272 / 853 Corporation Street
Santa Paula, CA 93061-0272
TEL: 805/392-2000
FAX: 805/525-4172

Office & Laboratory
2500 Stagecoach Road
Stockton, CA
TEL: 209/942-0181
FAX: 209/942-0423

Field Office
Visalia, CA
TEL: 559/734-9473
FAX: 559/734-8435
Mobile: 559/737-2399

B. Tree and Shrub Backfill Mix

1.	Native (site) soil	66%
2.	Nitrogen Fertilized Organic Material	33%
3.	Commerical Fertilizer (8-8-4)	1 lb./cu. yd.
4.	Iron	2 oz./cu. yd.
5.	Zinc	1 oz./cu. yd.
6.	Manganese	1 oz./cu. yd.

When planting specifications do not call for a separate backfill mix then backfill the holes that are excavated to install containerized plants using the native (site) soil amended according to the preplant recommendations given on page 1.

III. Leaching Requirement

It is recommended that this soil be thoroughly leached to lower the Sulfate, Chloride prior to planting. This leaching operation should be made after the application of any recommended soil amendments, but prior to applying any of the recommended preplant fertilizers. The leaching operation should consist of three applications of irrigation water with enough water being applied at each irrigation to thoroughly wet this soil to a depth of twenty-four inches with the water being applied at a rate slow enough to prevent any runoff. A two to three day waiting period between applications of water should occur to allow for internal soil drainage.

Sulfate, ChlorideSulfate, Chloride levels should be rechecked after the above leaching operation is completed to determine the degree of improvement. These new levels will allow for the selection of plants having the appropriate salt tolerances.

IV. Post-Plant Fertilization - lbs./1000 sq. ft.

Nitrogen	1 lb.
Phosphorus	1/4 lb.
Potassium	1/4 lb.

The actual post-plant requirements for fertilizers and soil amendments will vary depending upon the specific site conditions. Periodic post-plant analyses can be used to assure proper soil conditions and balanced levels of plant nutrition.

V. Irrigation

Make certain that the irrigation water being applied is penetrating to a depth slightly greater than the root zone of the plants being grown. Water with a frequency needed to maintain moist soil at all times - never wet for long periods and never let the soil dry out.

Application Notes

The application instructions listed below apply only if the material(s) is recommended in this report on page 1. Materials not included in the recommendations are excluded either because the analyses data did not indicate a need or the analysis to determine if a need existed was not requested.

Organic Materials

Nitrolized redwood compost is preferred but other organic mixes may be substituted depending upon the site requirements. Organic materials should be spread uniformly over the surface soils and when possible should be incorporated to a depth of two to three inches.

Limestone, Dolomite & Sulfur

These materials should be broadcast uniformly over the surface soils and then incorporated to a depth of two to three inches.

Gypsum

This material should be broadcast uniformly over surface soils for water penetration. For best results do not incorporate.

Preplant Phosphorous, Zinc, Manganese, Iron & Copper

These materials should be broadcast uniformly over the surface soils and then incorporated to a depth of two to three inches. Post-plant applications can be surface applied for water penetration.

Nitrogen, Potassium & Magnesium

These materials are highly water soluble and can be applied uniformly over the surface soils for water penetration or they can be incorporated with the other materials. Magnesium sources for plant nutrition include Epsom salts (Magnesium Sulfate), and the double salt of Potasium-Magnesium Sulfate (Sulfate of Potash-magnesia).

FRUIT GROWERS LABORATORY, INC.

ANALYTICAL CHEMISTS

September 9, 2005

Ninyo & Moore
5710 Ruffin Road
San Diego, CA 92123-1013

Lab ID : SP 0509021-001
Customer ID : 2-18569

Sampled On : August 2, 2005
Sampled By : Ninyo and Moore
Received On : August 30, 2005
Depth : 0-60"
Meth Irrg. : S.S. Sprinklers

Description : Detention Basin Composite
Project : McDowell Road Storm Drain

LANDSCAPE SOIL ANALYSIS

Test Description	Result	Units	Optimum Range	Graphical Results Presentation (Very Low / Moderately Low / Optimum / Moderately High / Very High)
Primary Nutrients				
Nitrate-Nitrogen	104	Lbs/AF	58 - 98	
Phosphorus-P_2O_5	30	Lbs/AF	280 - 370	
Potassium-K_2O (Exch)	490	Lbs/AF	1060 - 2650	
Potassium-K_2O (Sol)	90	Lbs/AF	130 - 500	1%
Secondary Nutrients				
Calcium (Exch)	20900	Lbs/AF	13500 - 18000	
Calcium (Sol)	1890	Lbs/AF	130 - 610	57%
Magnesium (Exch)	680	Lbs/AF	1370 - 2730	
Magnesium (Sol)	220	Lbs/AF	0 - 140	11%
Sodium (Exch)	320	Lbs/AF	0 - 1290	
Sodium (Sol)	1140	Lbs/AF	0 - 2070	30%
Sulfate	4880	Lbs/AF	820 - 4660	
Micro Nutrients				
Zinc	12.0	Lbs/AF	3.6 - 174	
Manganese	13.2	Lbs/AF	7.2 - 261	
Iron	33.2	Lbs/AF	27.4 - 290	
Copper	1.6	Lbs/AF	1.1 - 44.8	
Boron	1.1	Lbs/AF	1.9 - 7.9	
Chloride	1460	Lbs/AF	39 - 748	
CEC	28.1	meq/100g	5 - 65.0	
% Base Saturation				
CEC - Calcium	92.9	%	60 - 80.0	
CEC - Magnesium	5.0	%	10 - 20.0	
CEC - Potassium	0.93	%	2 - 5.00	
CEC - Sodium	1.25	%	0 - 5.00	
CEC - Hydrogen	0.00	%	0 - 3.00	
				Strongly Acidic / Moderately Acidic / Near Neutral / Moderately Alkaline / Strongly Alkaline
pH	7.94	---	6.5 - 7.50	

Good Problem Indicates physical conditions and/or phenological and amendment requirements.

Note: Color coded bar graphs have been used to provide you with 'AT-A-GLANCE' interpretations.

Corporate Offices & Laboratory
PO Box 272 / 853 Corporation Street
Santa Paula, CA 93061-0272
TEL: 805/392-2000
FAX: 805/525-4172

Office & Laboratory
2500 Stagecoach Road
Stockton, CA 95215
TEL: 209/942-0181
FAX: 209/942-0423

Field Office
Visalia, CA
TEL: 559/734-9473
FAX: 559/734-8435
Mobile: 559/737-2399

September 9, 2005

Ninyo & Moore

Lab ID : SP 0509021-001
Customer ID : 2-18569
Description : Detention Basin Composite

LANDSCAPE SOIL ANALYSIS

Test Description	Result	Units	Optimum Range	Graphical Results Presentation
Others				Satisfactory / Possible Problem / Moderate Problem / Increasing Problem
Soil Salinity	3.72	mmhos/cm	0.5 - 2.00	
SAR	3.3		0 - 6.0	
Limestone	8.5	%	0 - 0.5	
				0 / 1 / 2 / 3 / 4 / 5 / 6
Lime Requirement	0	Tons/AF	2.5 - 3.50	
				Very Low / Moderately Low / Optimum / Moderately High / Very High
Moisture	3.4	%	6.1 - 18.2	
				Loamy Sand / Sandy Loam / Loam / Silt Loam / Clay Loam / Clay / Organic
Saturation	24.3	%	40 - 50.0	

Good Problem *Indicates physical conditions and/or phenological and amendment requirements.*

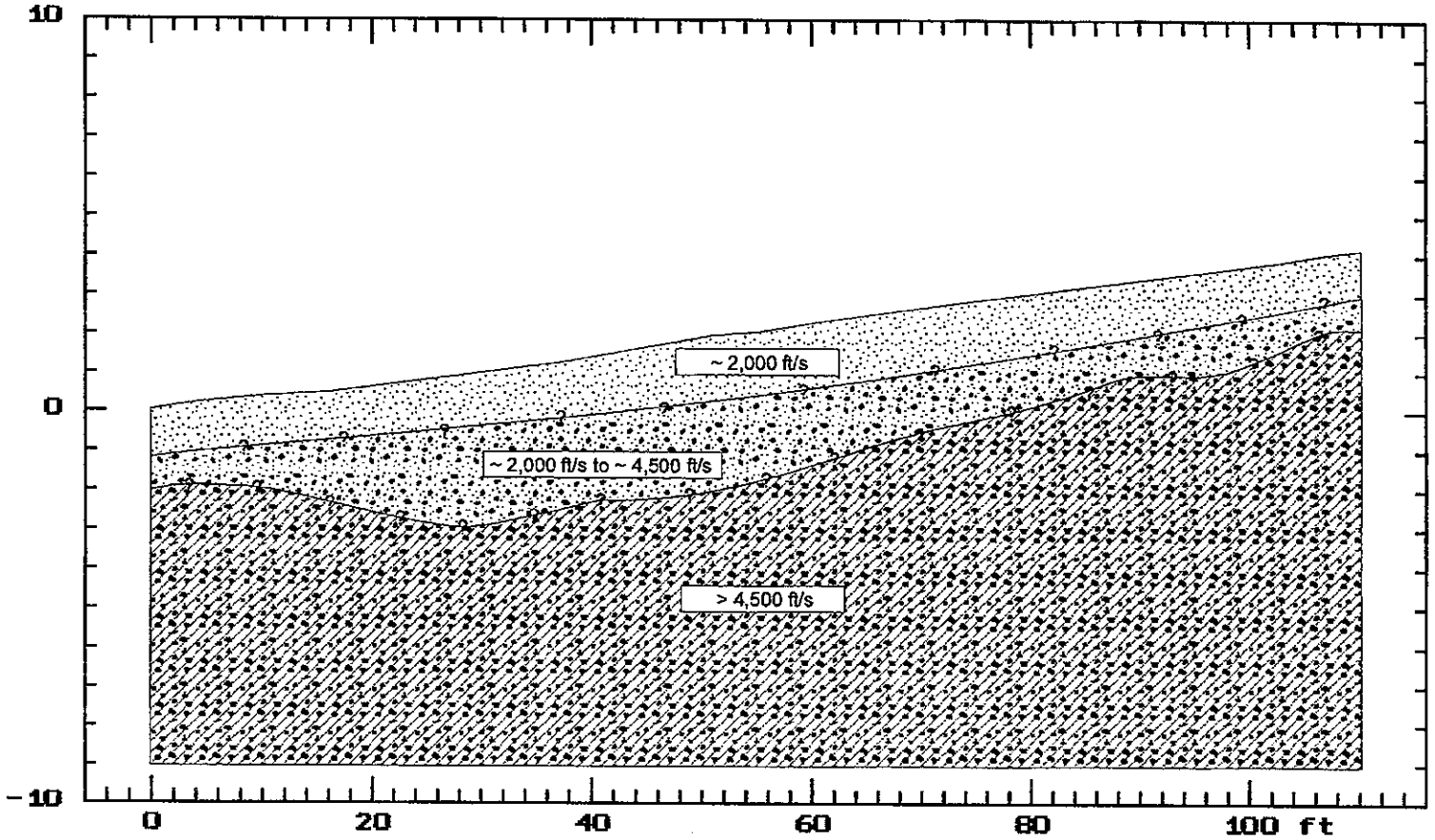
Note: Color coded bar graphs have been used to provide you with 'AT-A-GLANCE' interpretations.

Soil pH & Limestone levels are important to consider when making plant selections. Soil pH levels above 7.0 are not suitable for acid loving plants. Soils containing limestone are not suitable for plants sensitive to Limestone.

FRUIT GROWERS LABORATORY, INC.

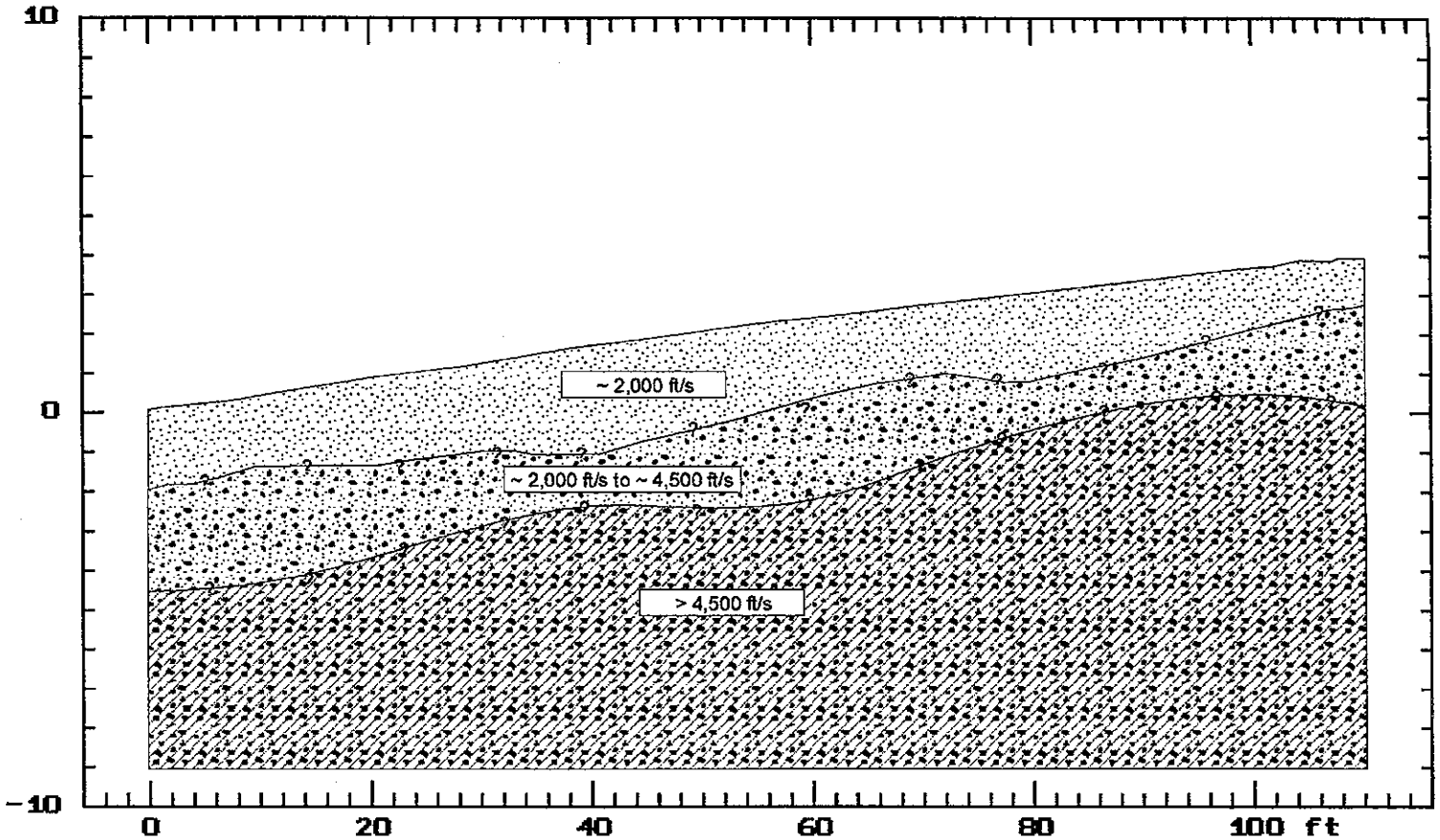
William L. Pidduck, Vice President

WLP:JRJ



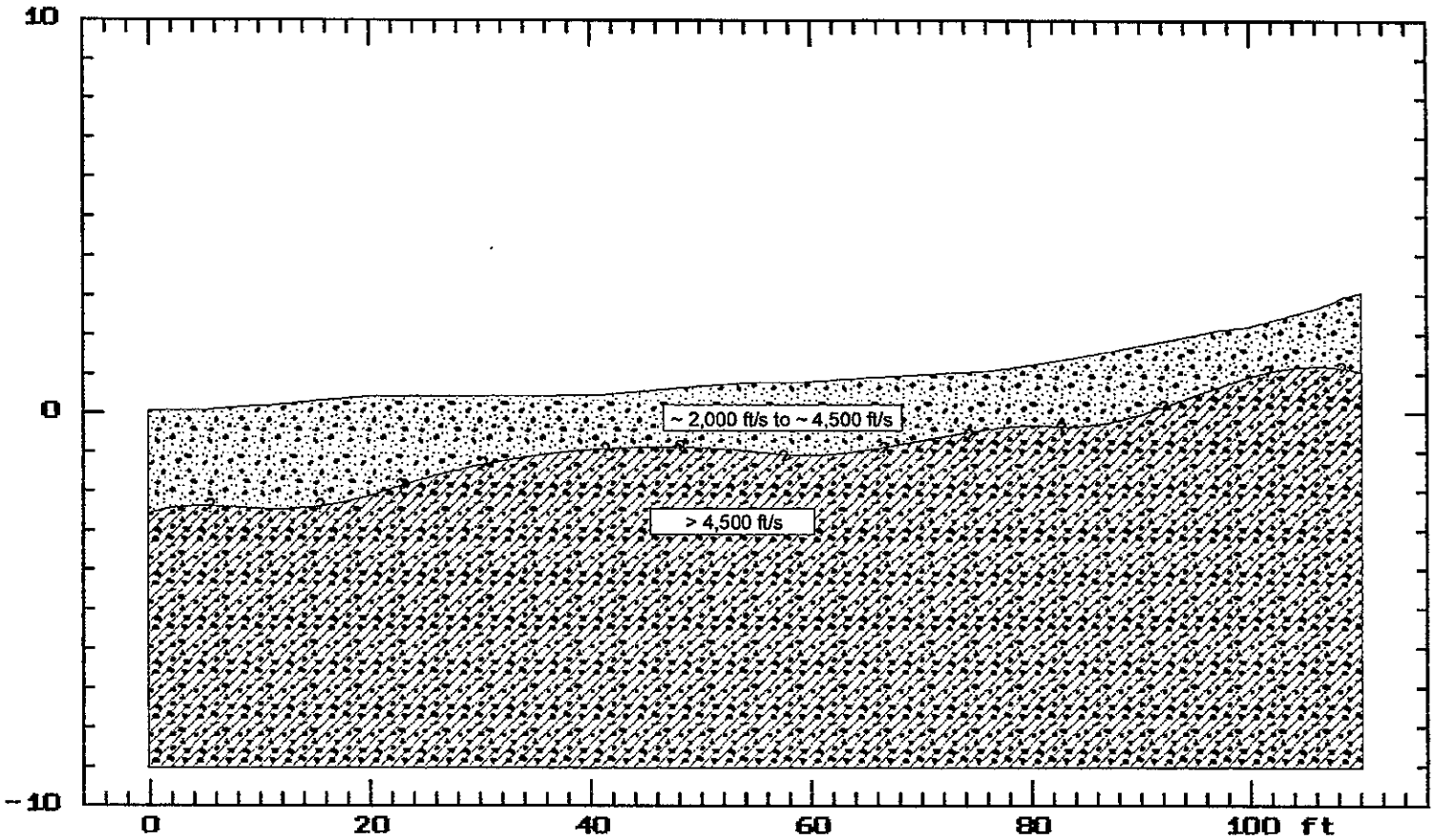
NOTE: This profile is based on seismic refraction surveys, exploratory borings, and test trenches. The layer changes shown are approximate and should not be used for detailed construction planning or estimating.

Ninyo & Moore	APPROXIMATE EXCAVATION PROFILE AT SL-1		
McDOWELL ROAD BASIN AND STORM DRAIN DESIGN MESA, ARIZONA			FIGURE
PROJECT No: 601052001	FILE No: 1052S-1	DATE: 01/06	C-1



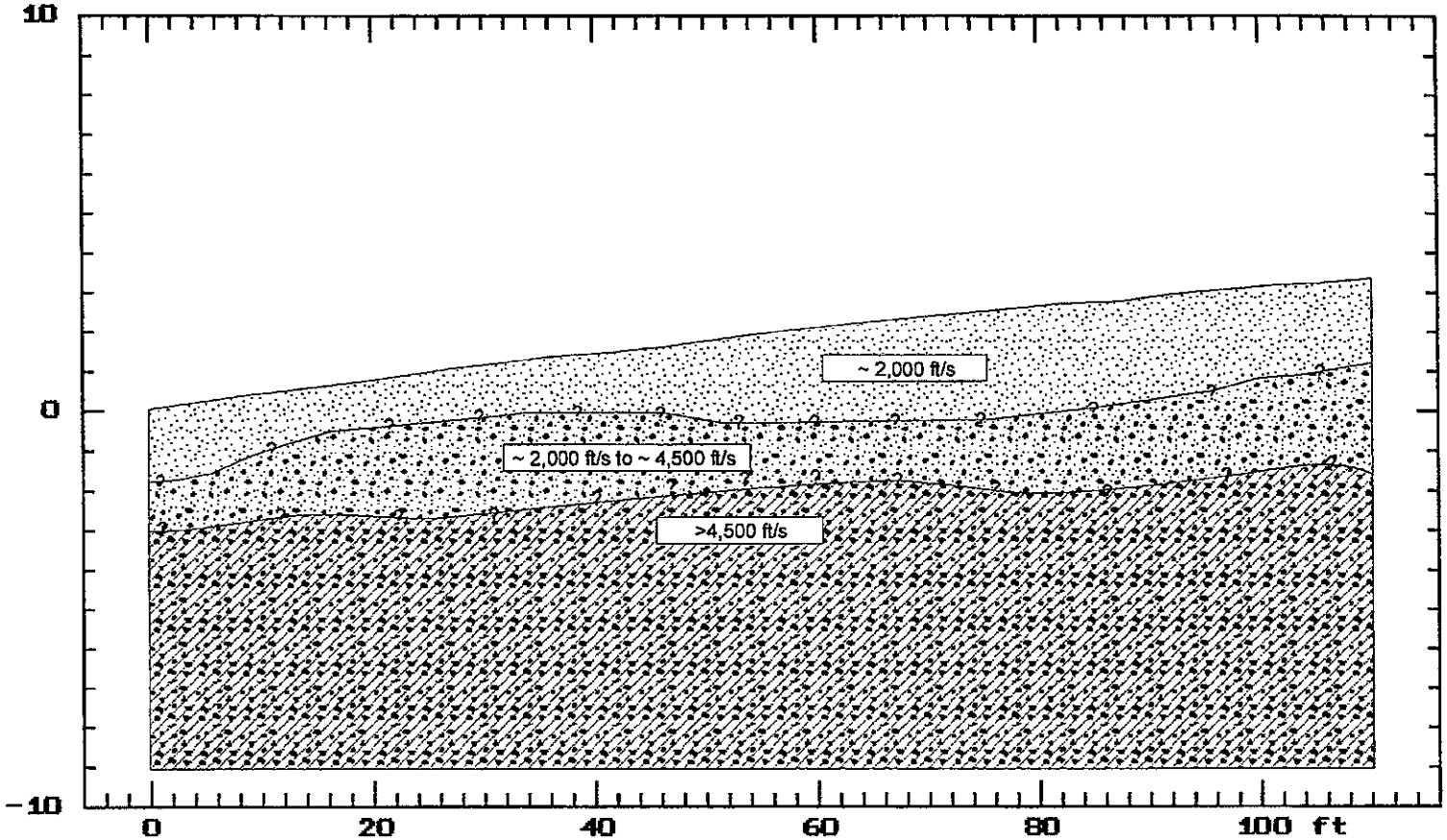
NOTE: This profile is based on seismic refraction surveys, exploratory borings, and test trenches. The layer changes shown are approximate and should not be used for detailed construction planning or estimating.

Ninyo & Moore	APPROXIMATE EXCAVATION PROFILE AT SL-2		
McDOWELL ROAD BASIN AND STORM DRAIN DESIGN MESA, ARIZONA			FIGURE C-2
PROJECT No: 601052001	FILE No: 1052S-2	DATE: 01/06	



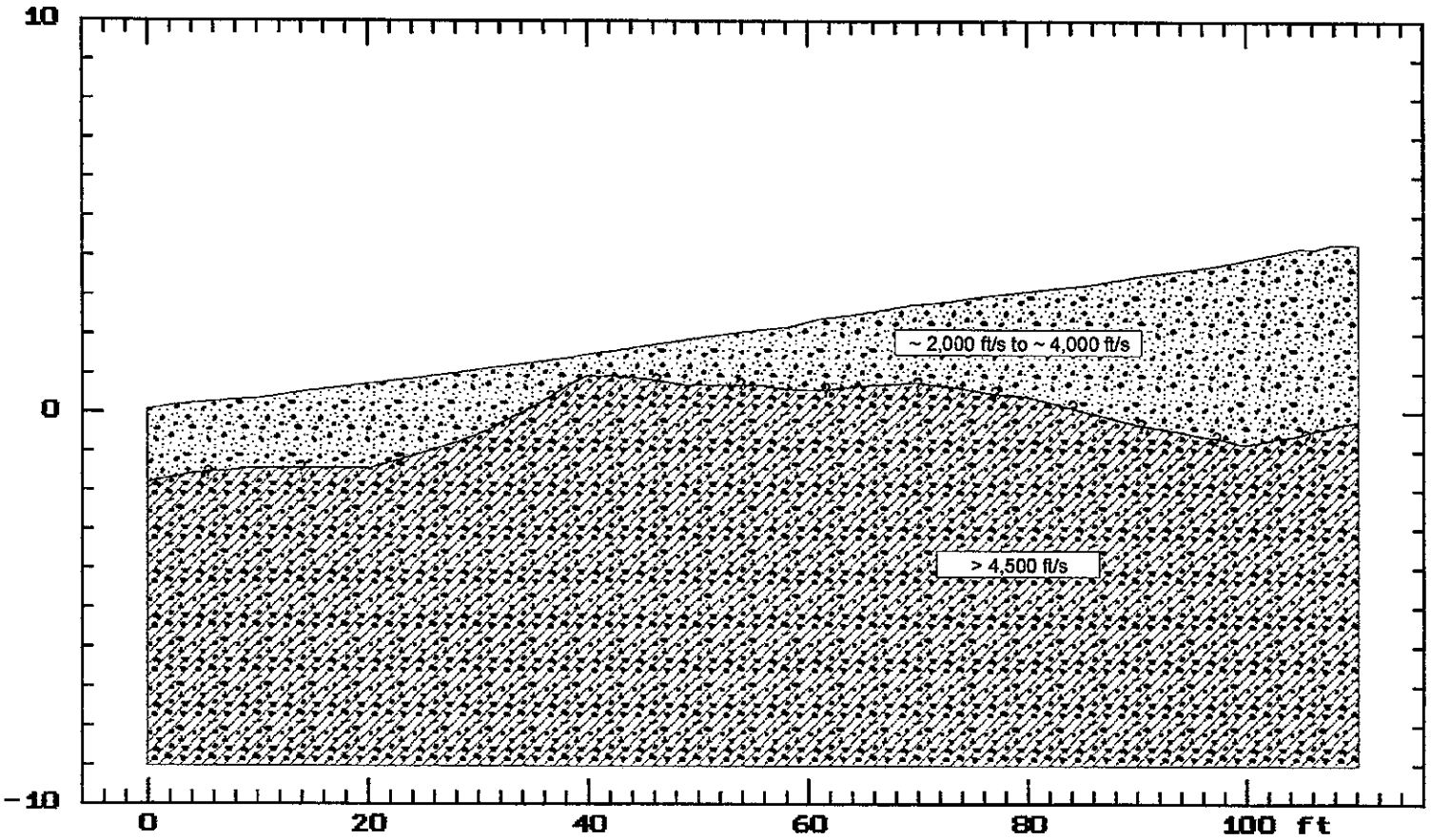
NOTE: This profile is based on seismic refraction surveys, exploratory borings, and test trenches. The layer changes shown are approximate and should not be used for detailed construction planning or estimating.

Ninyo & Moore	APPROXIMATE EXCAVATION PROFILE AT SL-3	
McDOWELL ROAD BASIN AND STORM DRAIN DESIGN MESA, ARIZONA		FIGURE
PROJECT No: 601052001	FILE No: 1052S-3	DATE: 01/06	C-3



NOTE: This profile is based on seismic refraction surveys, exploratory borings, and test trenches. The layer changes shown are approximate and should not be used for detailed construction planning or estimating.

Ninyo & Moore	APPROXIMATE EXCAVATION PROFILE AT SL-4		
McDOWELL ROAD BASIN AND STORM DRAIN DESIGN MESA, ARIZONA			FIGURE C-4
PROJECT No: 601052001	FILE No: 1052S-4	DATE: 01/06	



NOTE: This profile is based on seismic refraction surveys, exploratory borings, and test trenches. The layer changes shown are approximate and should not be used for detailed construction planning or estimating.

Ninyo & Moore	APPROXIMATE EXCAVATION PROFILE AT SL-5	
McDOWELL ROAD BASIN AND STORM DRAIN DESIGN MESA, ARIZONA		FIGURE
PROJECT No: 601052001	FILE No: 1052S-5	DATE: 01/06	C-5

APPENDIX E

PROJECT PHOTOGRAPHS

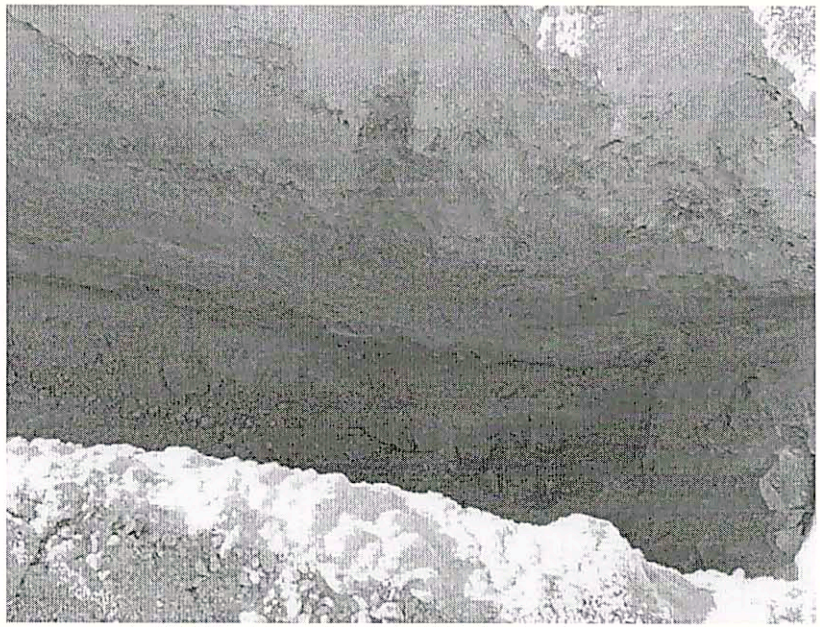


Photo1. L-1 View of pit at depth of 4 feet.

Photo 2. – Material causing difficulty in excavation at 4 feet

Photo 3.L-1 – View of test pit at 5 feet.

Photo 4. L-1 – View of cuttings from test pit.

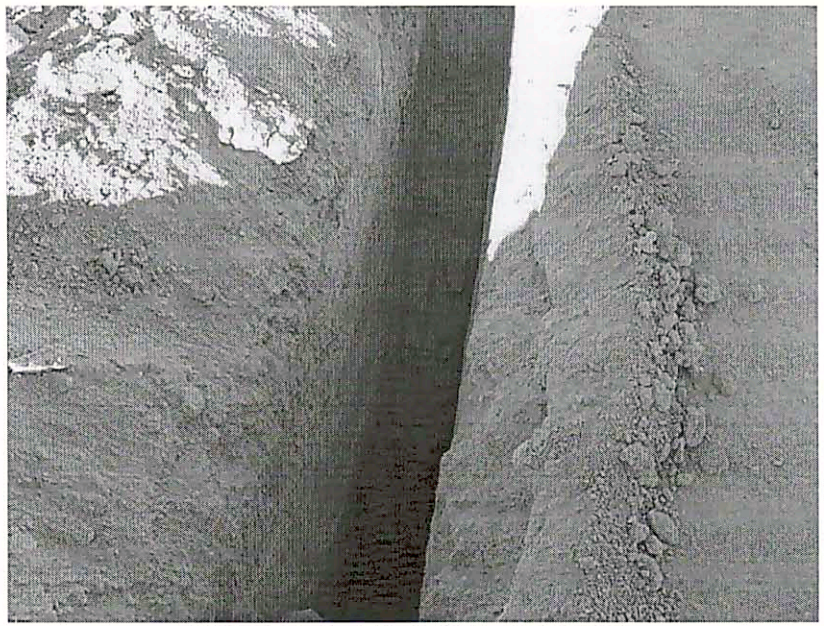


Photo 5. L-1 – Pit at depth of 10.9 feet.

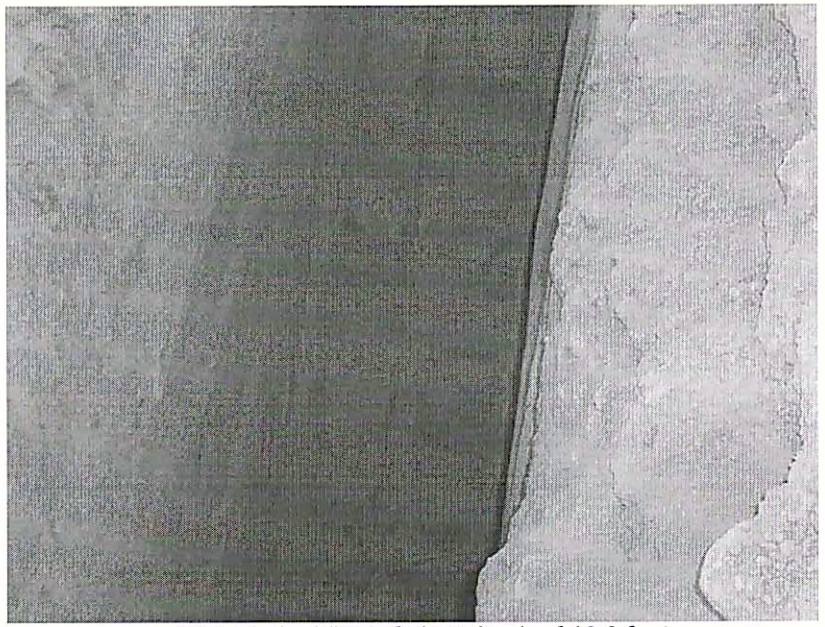


Photo 6. L-1 – View of pit at depth of 10.9 feet.

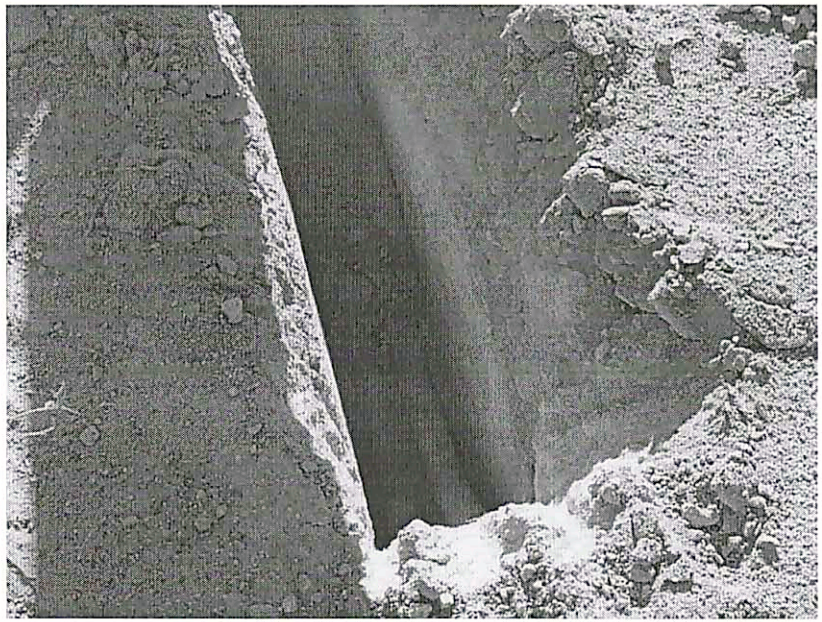


Photo 7. L-2 – View of pit at 6.9 feet.

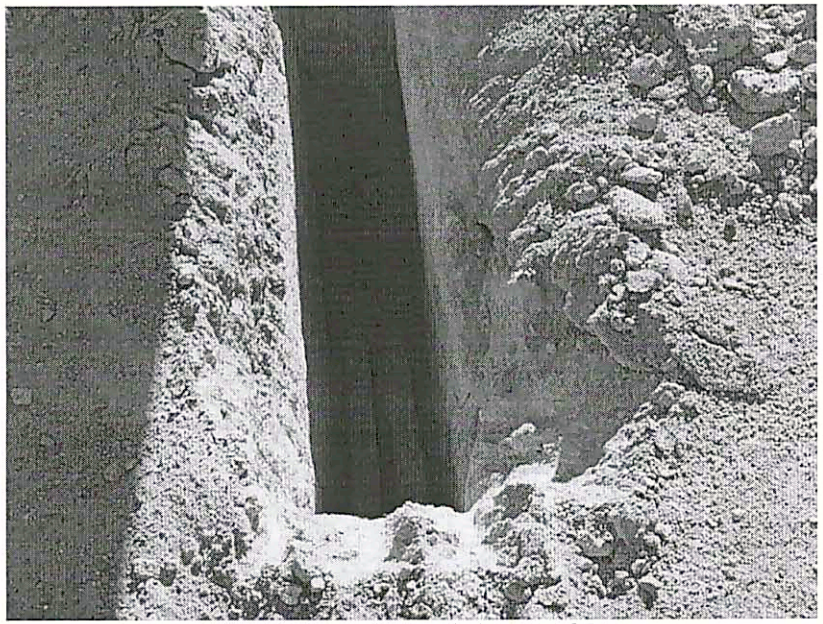


Photo 8. L-2 – View of pit at 6.9 feet.

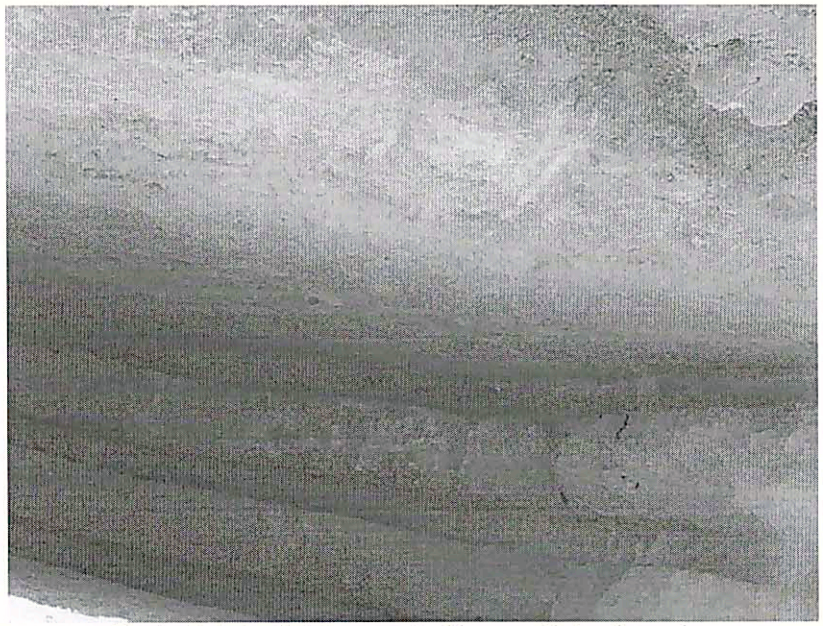


Photo 9. L-4 – Well-cemented layer with teeth marks.

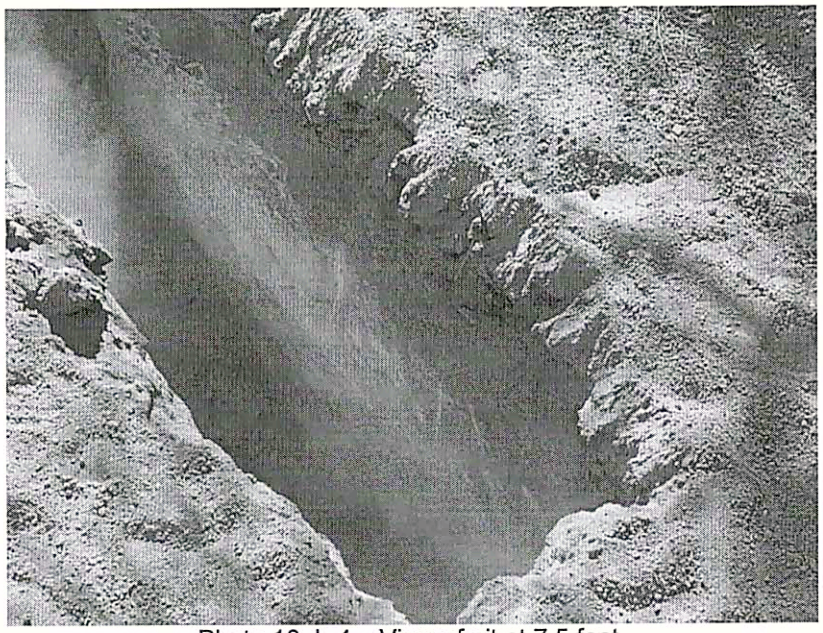


Photo 10. L-4 – View of pit at 7.5 feet.

Photo 11. L-4 – Piece of well cemented layer with teeth mark.

Photo 12. L-4 – View of pit at 10.9 feet.

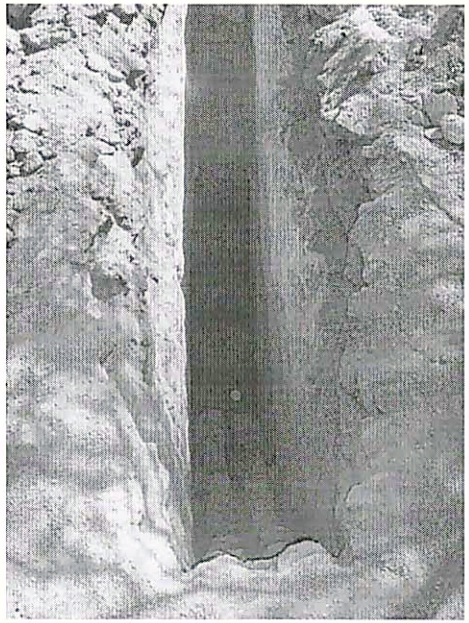


Photo 13. L-4 – View of pit at 10.9 feet.

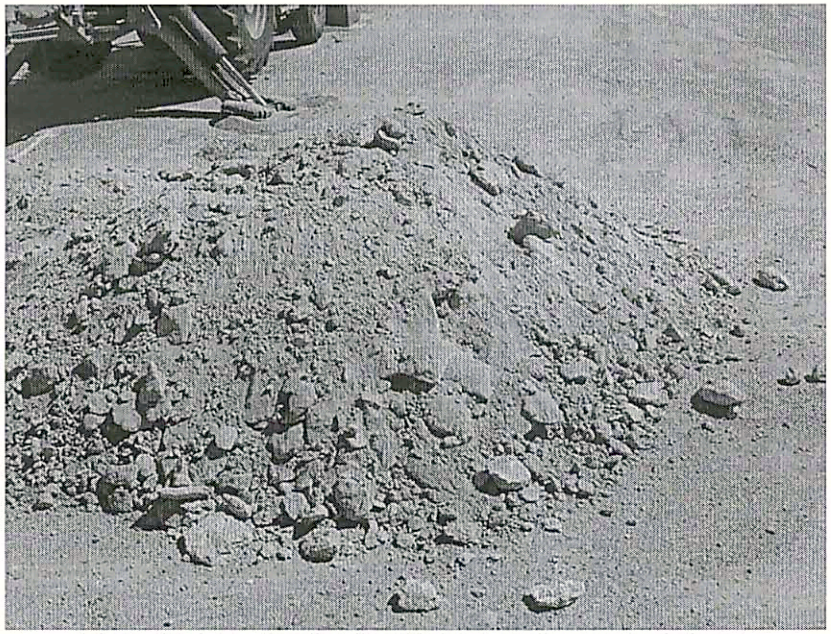


Photo 14. L-3 – Spoils pile with large well-cemented clasts.

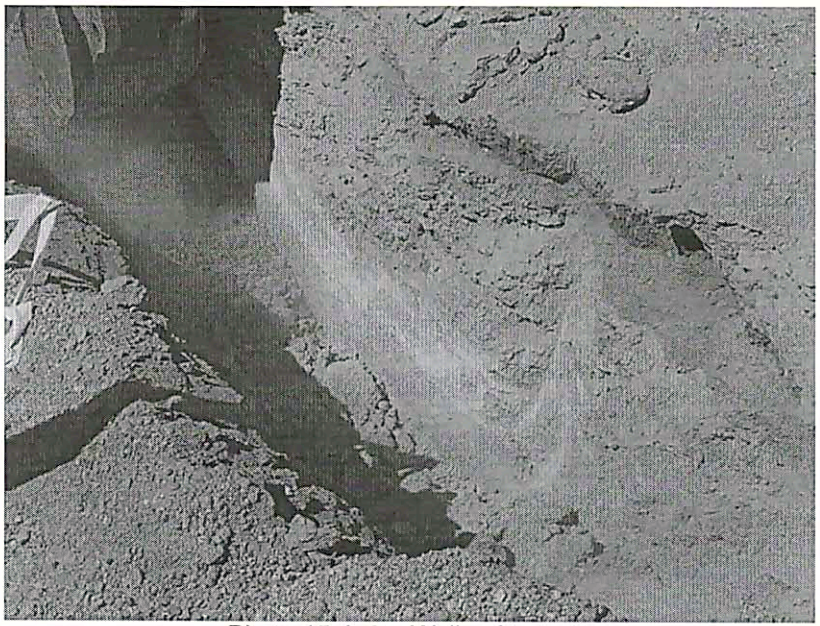


Photo 15. L-3 – Walls of test pit.

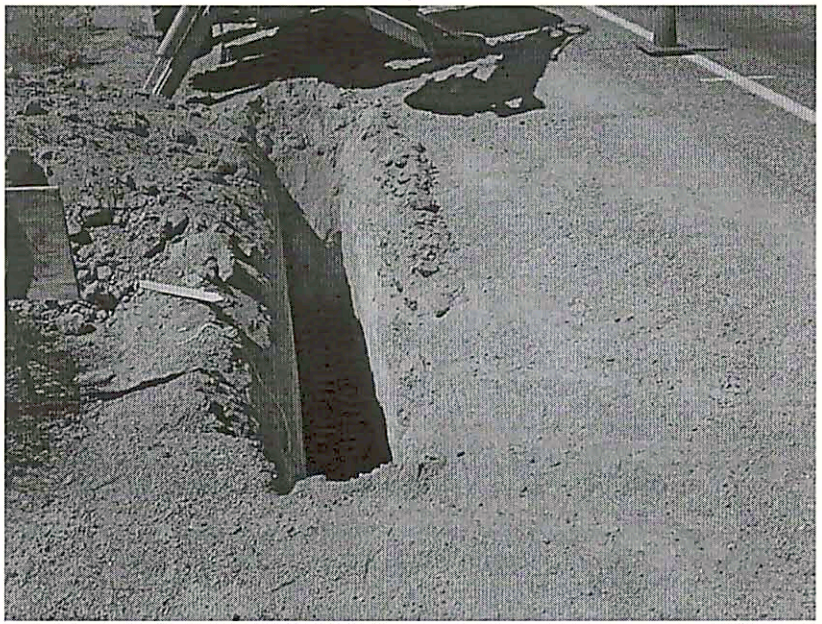


Photo 16. L-5 – View of test pit.

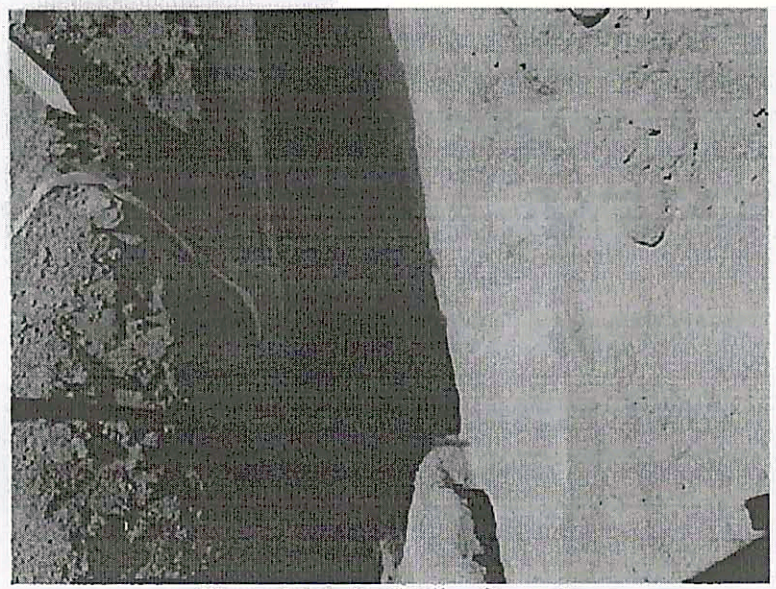


Photo 17. L-5 - Walls of test pit.

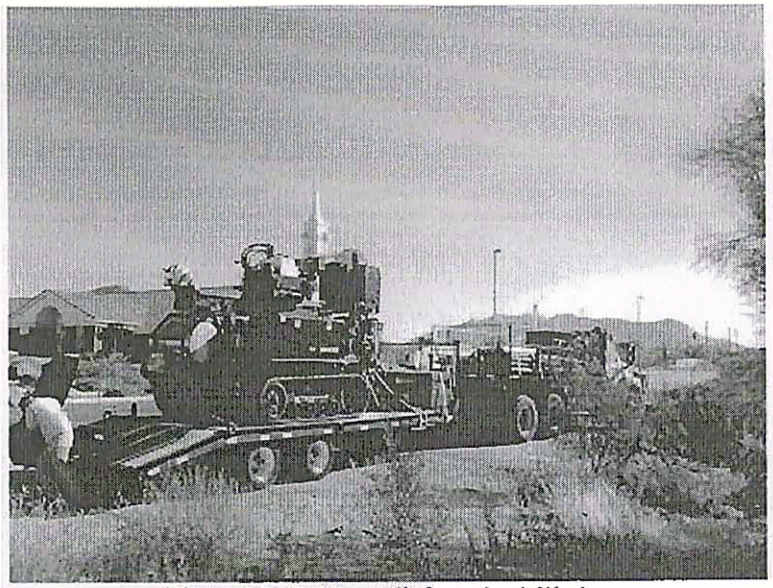


Photo 18. B-1A - Mini-sonic drill rig.

Photo 19. B-1A - Location of B1-A.

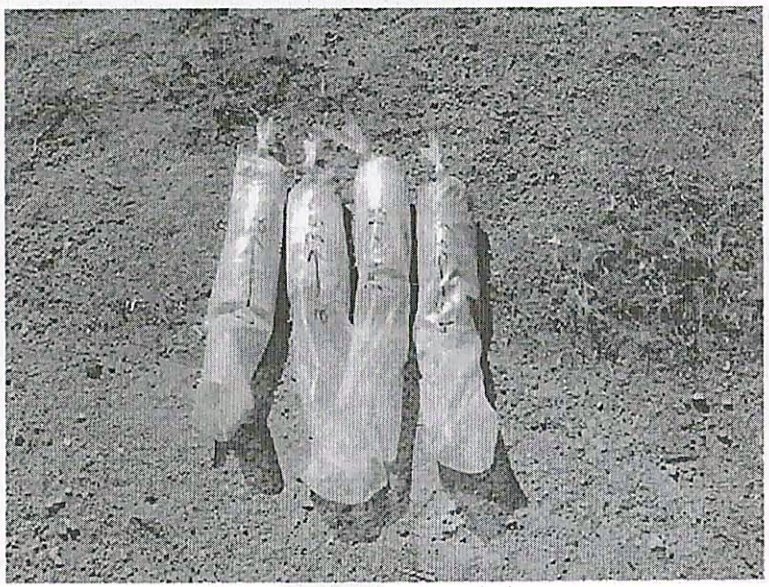


Photo 20. B-1A - Sample bags.

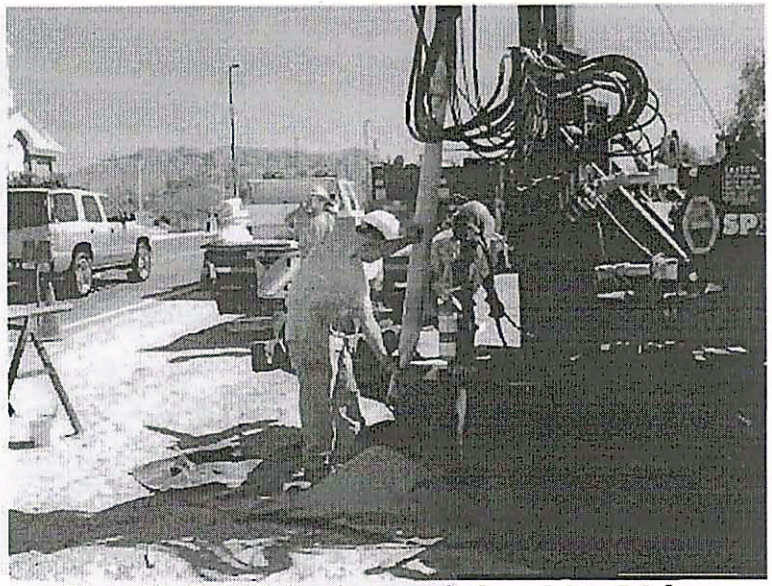


Photo 21. B-1ACollecting sample from 5.5 to 7.5 feet.

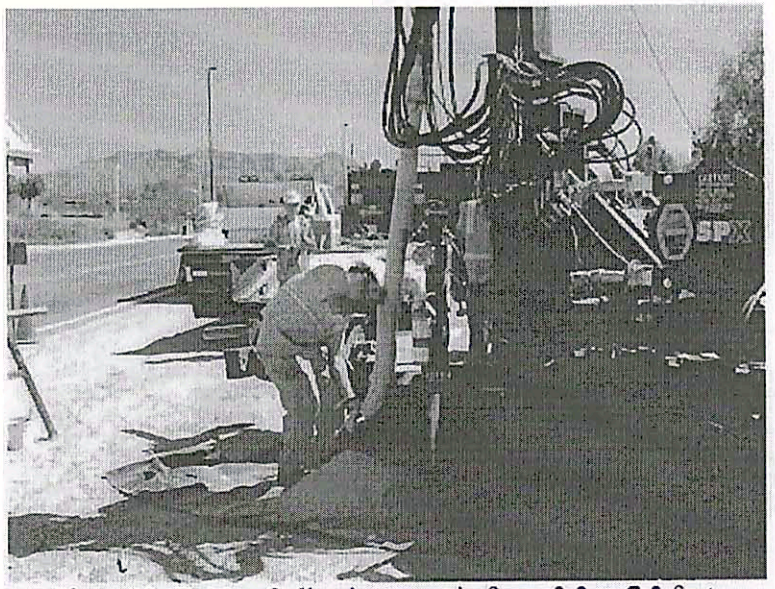


Photo 22. B-1A - Collecting sample from 5.5 to 7.5 feet.

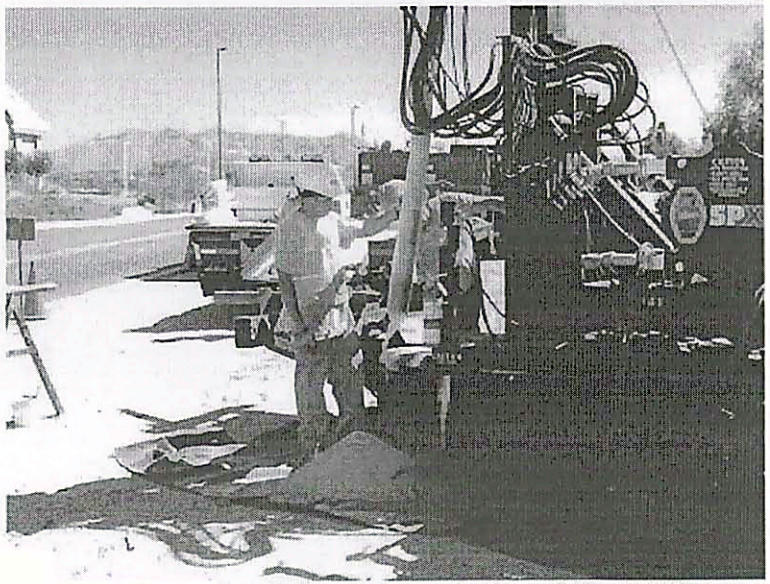


Photo 23. B-1A - Collecting sample from 5.5 to 7.5 feet.

Photo 24. B-1A - Sample bags.

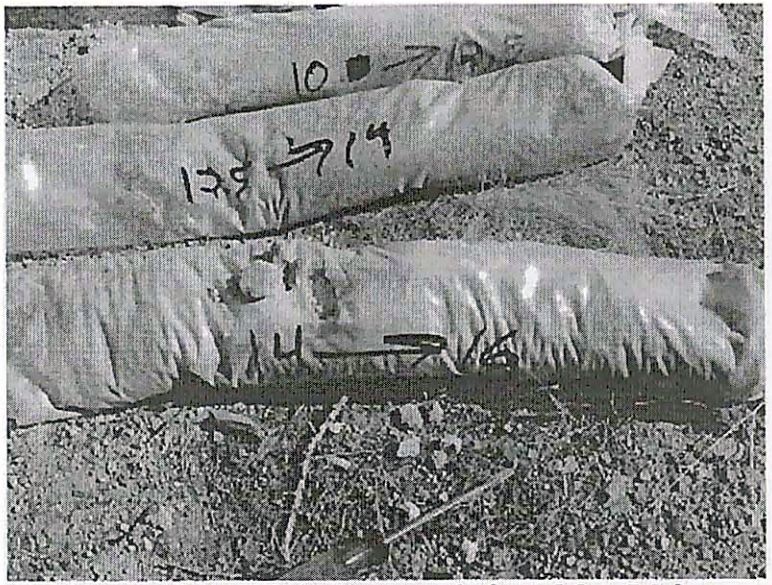


Photo 25. B-1A - Collecting sample from 5.5 to 7.5 feet.

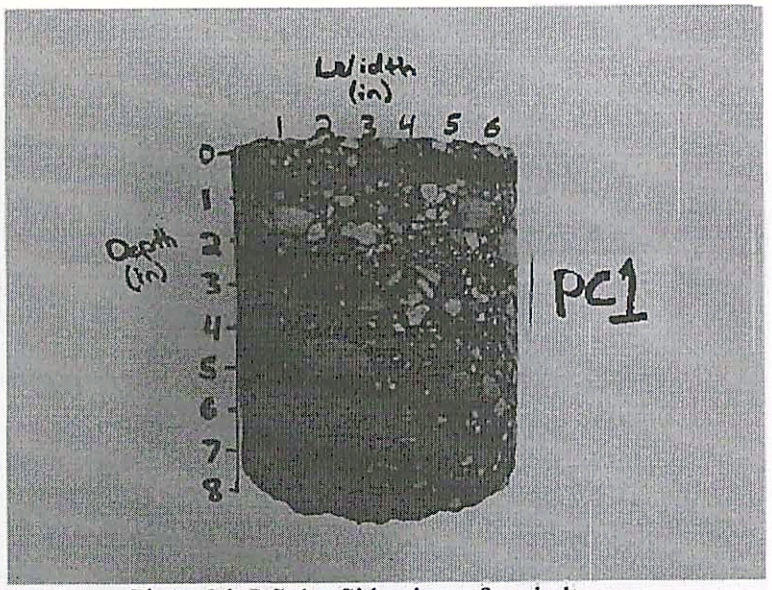


Photo 26. PC-1 - Side view of asphalt core.

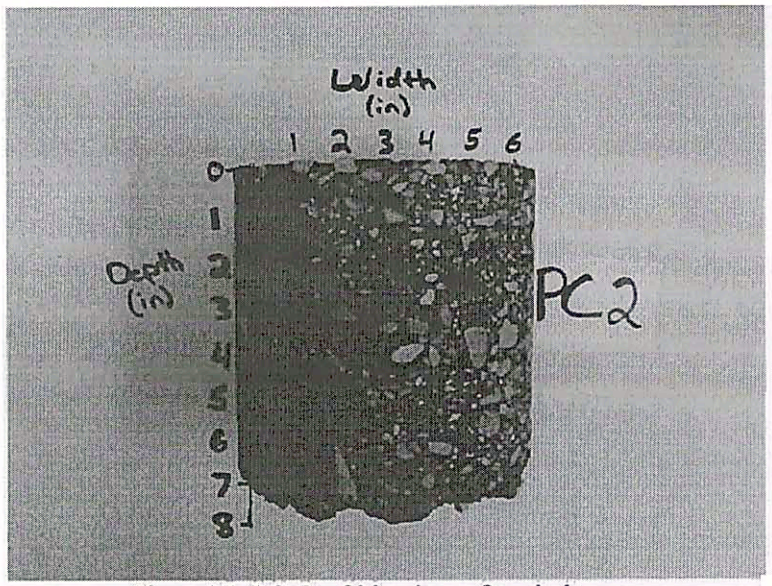


Photo 27. PC-2 - Side view of asphalt core.

APPENDIX C

SEISMIC REFRACTION SURVEYS

Ninyo and Moore personnel conducted seismic refraction surveys at the site on September 28, 2005 to evaluate the rippability characteristics of the subsurface materials. The seismic refraction data were collected with a SmartSeis S12, high performance digital exploration seismograph and 12 vertical component geophones. A 10-pound hammer and metal plate were used as the seismic wave source. A total of 5 seismic refraction traverses were performed along the south edge of McDowell Road between Sossaman Road and Hawes Road. The approximate locations of the surveys are depicted on Figure 2.

The seismic refraction method uses first-arrival times of refracted seismic waves to determine the thicknesses and seismic velocities of subsurface layers. Seismic waves generated at the surface are refracted at boundaries separating materials of contrasting velocities. These refracted seismic waves are then detected by a series of surface geophones and recorded with a seismograph. The travel times of the seismic waves are used in conjunction with the shot-to-geophone distances to obtain thickness and velocity information on the subsurface materials.

The refraction method requires that subsurface velocities (and therefore material density) increase with depth. A layer having a velocity lower than that of the layer above will not be detectable by the seismic refraction method and, therefore, could lead to errors in the depth calculations of subsequent layers. In addition, lateral variations in velocity can also result in the misinterpretation of the subsurface conditions.

In general, seismic wave velocities can be correlated to material density and/or rock hardness. The relationship between rippability and seismic velocity is empirical and assumes a homogenous mass. Localized areas of differing composition, texture, or structure may affect both the measured data and the actual rippability of the mass. The rippability of a mass is also dependent on the excavation equipment used and the skill and experience of the equipment operator.

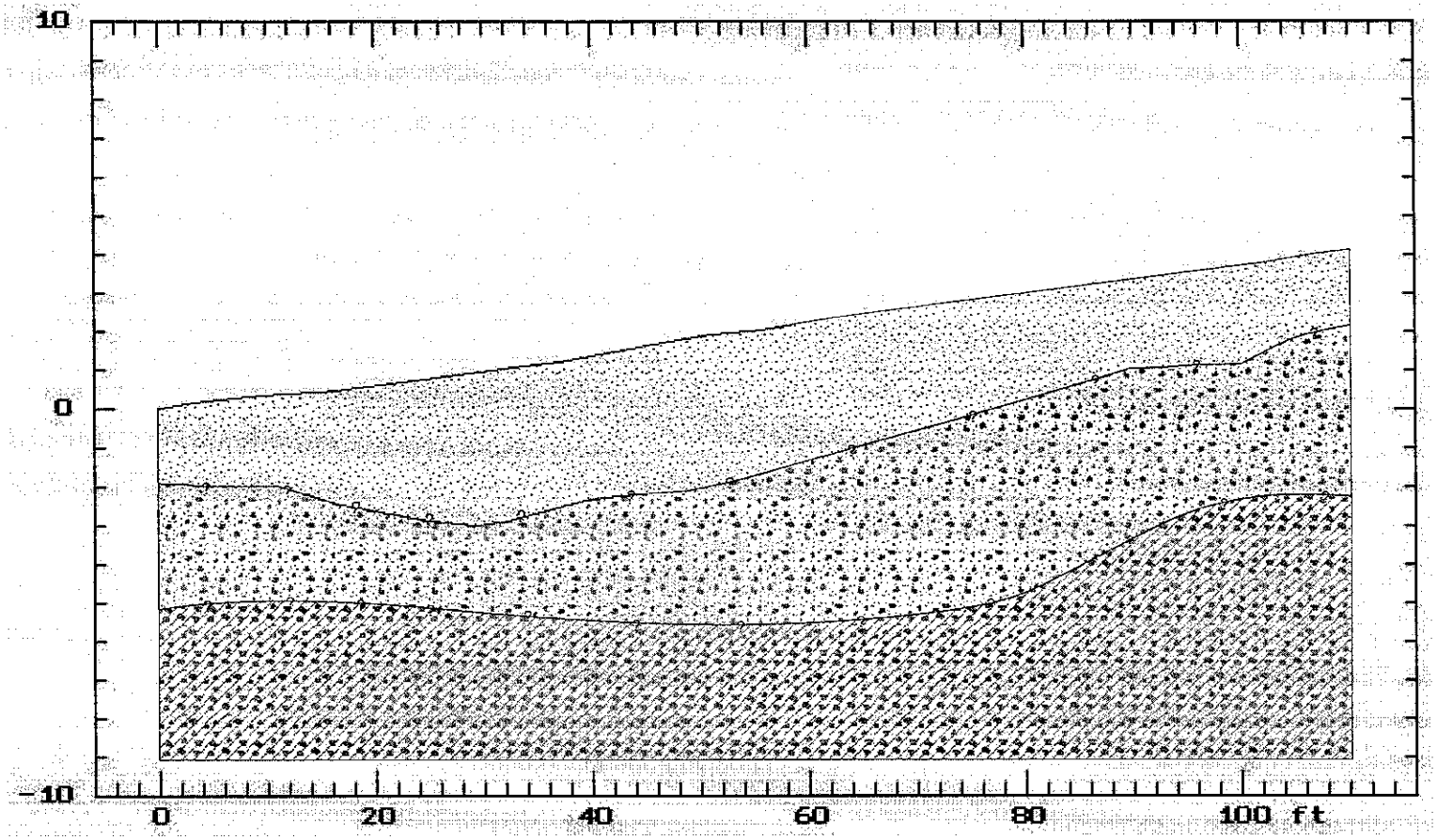
The following rippability chart (Table C-1) is based on our experience with similar materials. It assumes that a Caterpillar D-9 dozer ripping with a single shank is used. We emphasize that the cutoffs in this classification scheme are approximate and that soil characteristics such as degree of cementation by caliche or carbonate can play a significant role in determining excavation rates and rippability. In addition, where excavations encounter or penetrate, weathered or fresh bedrock, rock characteristics, such as depth of and degree of weathering, and fracture spacing and orientation play a significant role in determining rock rippability. These soil and rock characteristics may also vary with location and depth.

Table C-1 - Qualitative Rippability Classification

0 to 2000 ft/s	Easy Ripping
2000 to 4000 ft/s	Moderate Ripping
4000 to 5500 ft/s	Difficult Ripping, Possible Blasting
5500 to 7000 ft/s	Very Difficult Ripping, Probable Blasting
Greater than 7000 ft/s	Blasting Generally Required

For trenching operations, the rippability figures should be scaled downward. For example, velocities as low as 3,500 feet per second may indicate difficult ripping during trenching operations. In addition, the presence of cobbles and boulders, which can be troublesome in a narrow trench, should be anticipated. The above classification scheme should be used with discretion, and contractors should not be relieved of making their own independent evaluation of the rippability of the on-site materials prior to submitting their bids.

Approximate layer profiles are presented in Figures C-1 through C-5, which are attached to this appendix.It should also be noted that, as a general rule of thumb, the effective depth of evaluation for a seismic refraction traverse is approximately one-third to one-fifth the length of the refraction line.

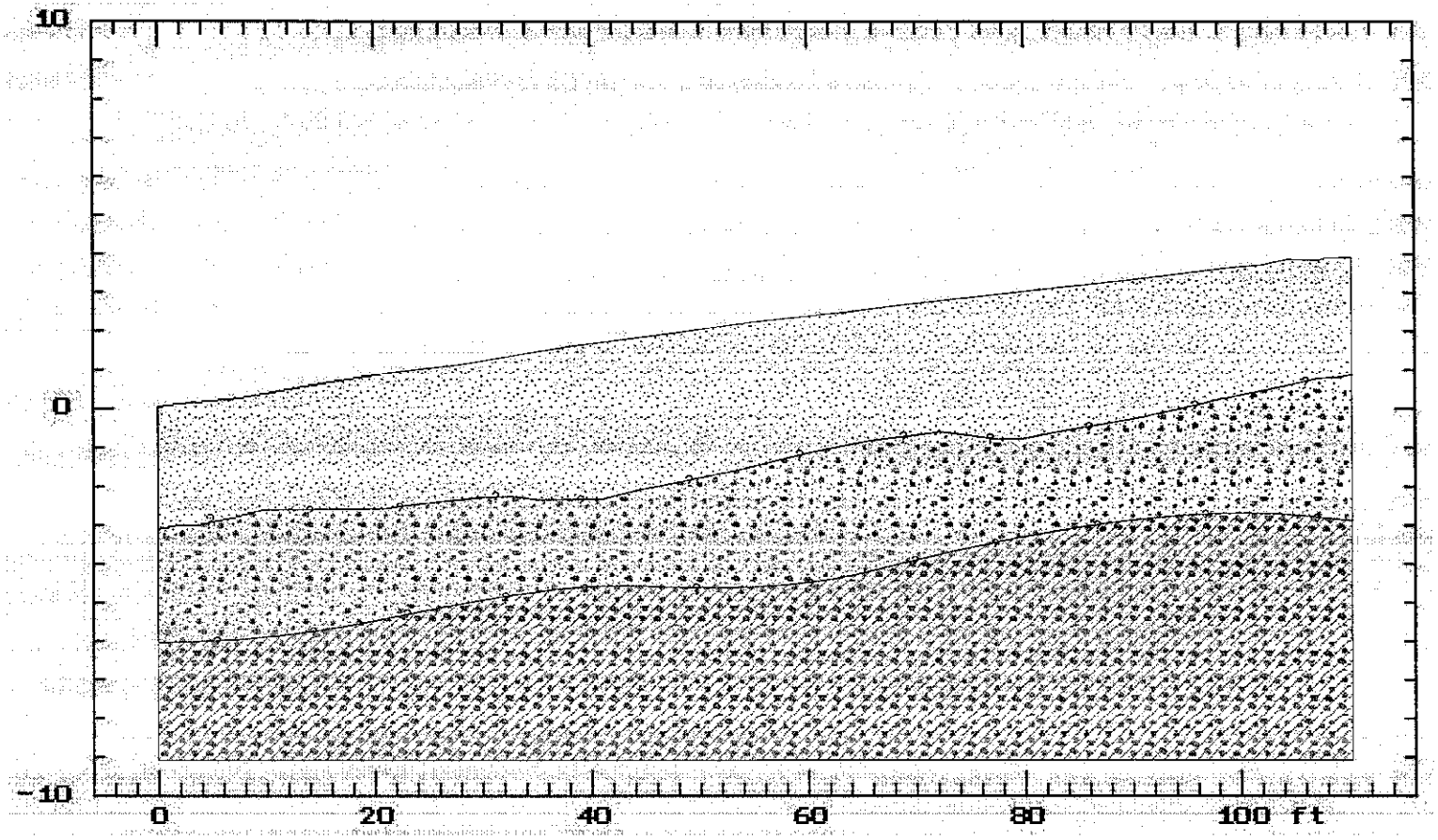


NOTE: This interpreted profile is based on seismic refraction surveys, exploratory borings, and test trenches. The layer changes shown are approximate and should not be used for detailed construction planning or estimating.

LEGEND

- Easy to Moderate Ripping.
- Moderate to Difficult Ripping.
- Difficult Ripping, Possible Blasting.
- —?— Approximate Location of Layer Change.

Ninyo & Moore	APPROXIMATE EXCAVATION PROFILE AT SL-1	
McDOWELL ROAD BASIN AND STORM DRAIN DESIGN MESA, ARIZONA		FIGURE
PROJECT No: 601052001	FILE No: 1052S-1	DATE: 01/06	C-1

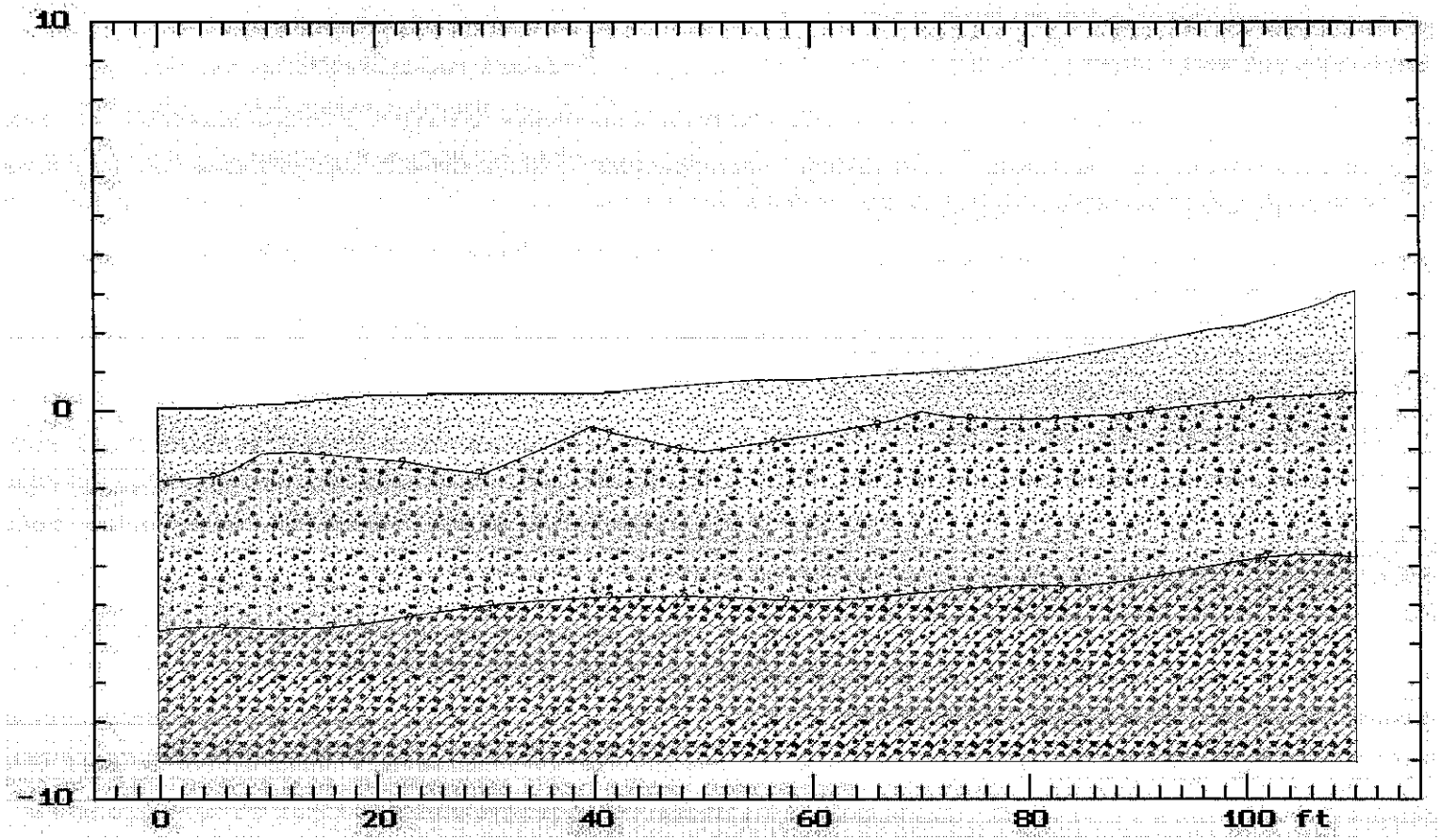


NOTE: This interpreted profile is based on seismic refraction surveys, exploratory borings, and test trenches. The layer changes shown are approximate and should not be used for detailed construction planning or estimating.

LEGEND

- Easy to Moderate Ripping.
- Moderate to Difficult Ripping.
- Difficult Ripping, Possible Blasting.
- —?— Approximate Location of Layer Change.

Ninyo & Moore	APPROXIMATE EXCAVATION PROFILE AT SL-2	
McDOWELL ROAD BASIN AND STORM DRAIN DESIGN MESA, ARIZONA		FIGURE
PROJECT No: 601052001	FILE No: 1052S-2	DATE: 01/06	C-2



NOTE: This interpreted profile is based on seismic refraction surveys, exploratory borings, and test trenches. The layer changes shown are approximate and should not be used for detailed construction planning or estimating.

LEGEND

- Easy to Moderate Ripping.
- Moderate to Difficult Ripping.
- Difficult Ripping, Possible Blasting.
- Approximate Location of Layer Change.

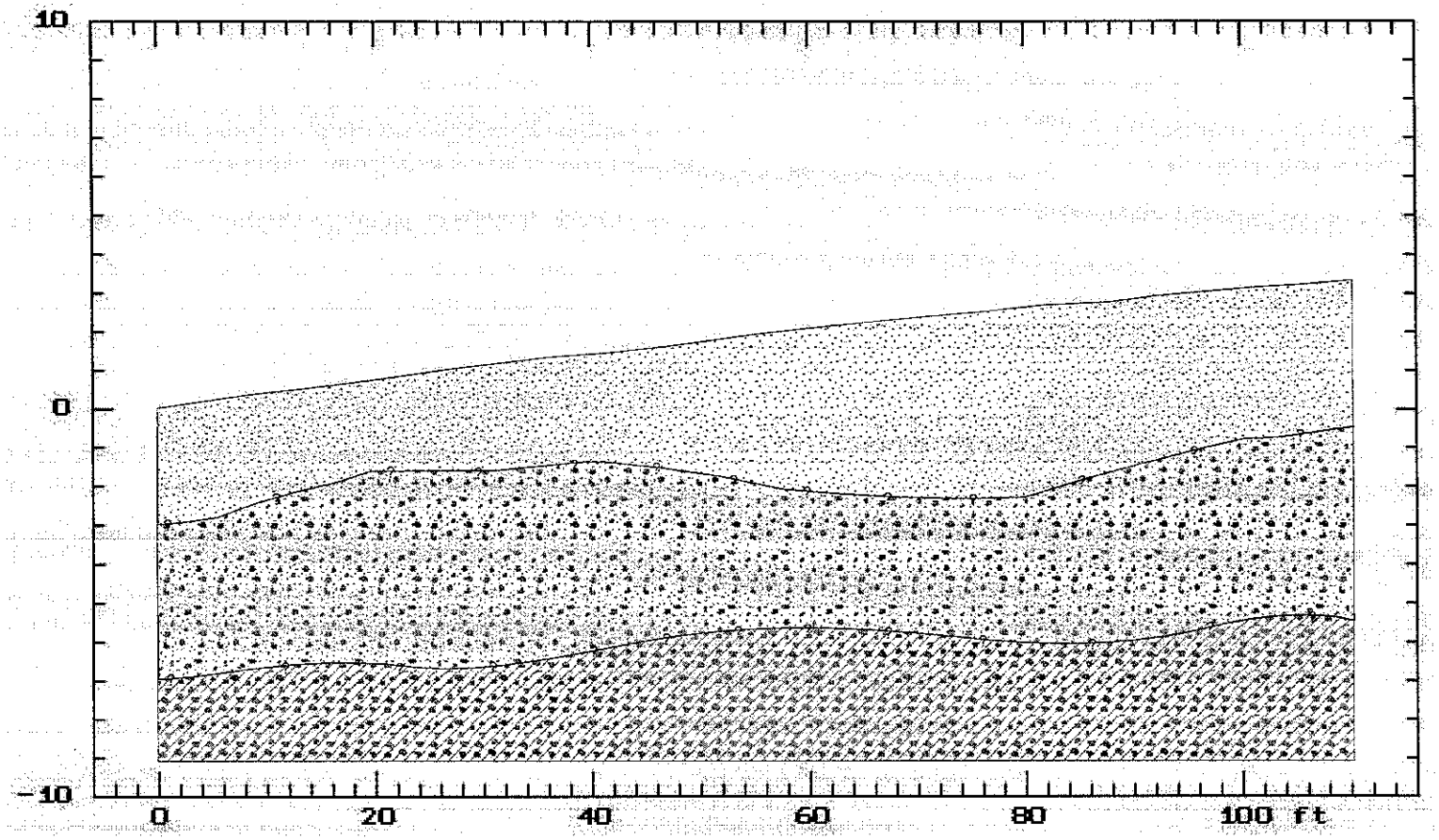
Ninyo & Moore

APPROXIMATE EXCAVATION PROFILE AT SL-3

McDOWELL ROAD BASIN AND STORM DRAIN DESIGN
MESA, ARIZONA

FIGURE C-3

PROJECT No:	FILE No:	DATE:
601052001	1052S-3	01/06

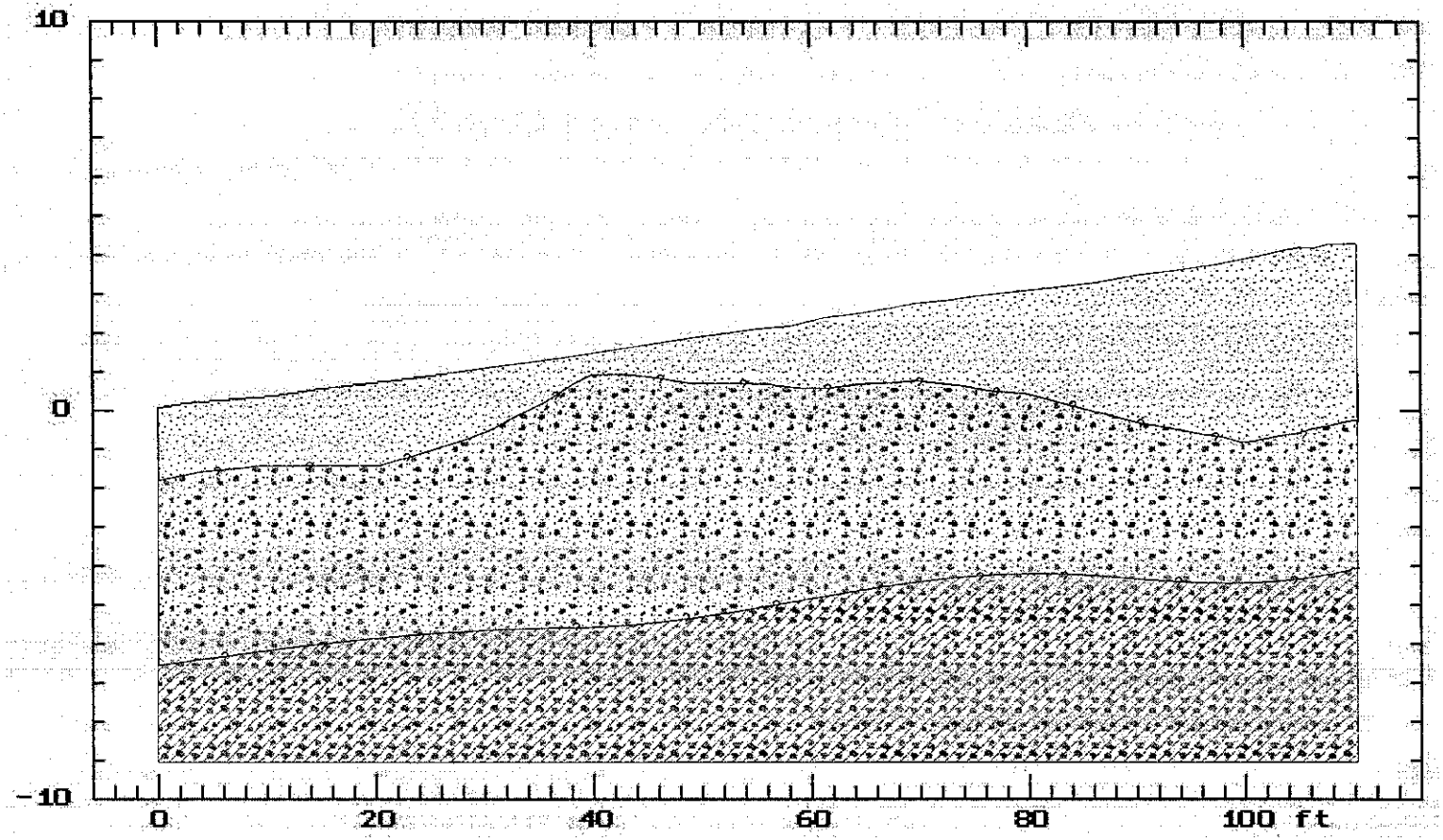


NOTE: This interpreted profile is based on seismic refraction surveys, exploratory borings, and test trenches. The layer changes shown are approximate and should not be used for detailed construction planning or estimating.

LEGEND

- Easy to Moderate Ripping.
- Moderate to Difficult Ripping.
- Difficult Ripping, Possible Blasting.
- —?— Approximate Location of Layer Change.

Ninyo & Moore	APPROXIMATE EXCAVATION PROFILE AT SL-4	
McDOWELL ROAD BASIN AND STORM DRAIN DESIGN MESA, ARIZONA		FIGURE
PROJECT No: 601052001	FILE No: 1052S-4	DATE: 01/06	C-4



NOTE: This interpreted profile is based on seismic refraction surveys, exploratory borings, and test trenches. The layer changes shown are approximate and should not be used for detailed construction planning or estimating.

LEGEND

- Easy to Moderate Ripping.
- Moderate to Difficult Ripping.
- Difficult Ripping, Possible Blasting.
- —?— Approximate Location of Layer Change.

Ninyo & Moore	APPROXIMATE EXCAVATION PROFILE AT SL-5		
McDOWELL ROAD BASIN AND STORM DRAIN DESIGN MESA, ARIZONA			FIGURE
PROJECT No: 601052001	FILE No: 1052S-5	DATE: 01/06	C-5

APPENDIX D

AGRONOMIC TEST RESULTS

FRUIT GROWERS LABORATORY, INC.

ANALYTICAL CHEMISTS

September 9, 2005

Lab ID : SP 0509021-001
Customer ID : 2-18569

Ninyo & Moore
5710 Ruffin Road
San Diego, CA 92123-1013

Recommendation for McDowell Road Storm Drain

The following report presents the results of analyses conducted on your soil. See page 4 for sample information and analyses results. The following recommendations are based upon the current conditions of the soil. All application recommendations are for each 1,000 square feet of growing area. Please be sure to read the standard application notes presented on page 3.

I. Plant Selection

The Analyses of this soil indicates the following plant selection requirements:

A. Select only non-acidic loving plants for this soil.
B. Select only those plants that have a high or greater tolerance to free limestone for planting at this site.
C. Select only those plants that have a moderate or greater tolerance to Salinity for planting at this site. A review of the plants growing in the immediate area of the site to be landscaped will provide some additional guidelines as to the proper plant selection.

II. Preplant Soil Amendments and Fertilizers

A. Turf and Groundcover

	Apply per 1000 sq. ft.
1. Soil Amendments	
a. Organic (Well-composted)	2.00 cu. yds.
b. Limestone	0.00 lbs.
c. Soil Sulfur	0.00 lbs.
	Apply per 1000 sq. ft.
2. Fertilizers	
a. Nitrogen (N)	0.00 lbs.
b. Phosphorus (P2O5)	3.90 lbs.
c. Potassium (K2O)	2.00 lbs.
d. Magnesium (Mg)	0.00 lbs.
e. Zinc (Zn)	0.00 lbs.
f. Manganese (Mn)	0.00 lbs.
g. Iron (Fe)	0.60 lbs.
h. Copper (Cu)	0.05 lbs.
i. Boron (B)	0.01 lbs.

Corporate Offices & Laboratory
PO Box 272 / 853 Corporation Street
Santa Paula, CA 93061-0272
TEL: 805/392-2000
FAX: 805/525-4172

Office & Laboratory
2500 Stagecoach Road
Stockton, CA 95215
TEL: 209/942-0181
FAX: 209/942-0423

Field Office
Visalia, CA
TEL: 559/734-9473
FAX: 559/734-8435
Mobile: 559/737-2399

B. Tree and Shrub Backfill Mix

1.	Native (site) soil	66%
2.	Nitrogen Fertilized Organic Material	33%
3.	Commerical Fertilizer (8-8-4)	1 lb./cu. yd.
4.	Iron	2 oz./cu. yd.
5.	Zinc	1 oz./cu. yd.
6.	Manganese	1 oz./cu. yd.

When planting specifications do not call for a separate backfill mix then backfill the holes that are excavated to install containerized plants using the native (site) soil amended according to the preplant recommendations given on page 1.

III. Leaching Requirement

It is recommended that this soil be thoroughly leached to lower the Sulfate, Chloride prior to planting. This leaching operation should be made after the application of any recommended soil amendments, but prior to applying any of the recommended preplant fertilizers. The leaching operation should consist of three applications of irrigation water with enough water being applied at each irrigation to thoroughly wet this soil to a depth of twenty-four inches with the water being applied at a rate slow enough to prevent any runoff. A two to three day waiting period between applications of water should occur to allow for internal soil drainage.

Sulfate, ChlorideSulfate, Chloride levels should be rechecked after the above leaching operation is completed to determine the degree of improvement. These new levels will allow for the selection of plants having the appropriate salt tolerances.

IV. Post-Plant Fertilization - lbs./1000 sq. ft.

Nitrogen	1 lb.
Phosphorus	1/4 lb.
Potassium	1/4 lb.

The actual post-plant requirements for fertilizers and soil amendments will vary depending upon the specific site conditions. Periodic post-plant analyses can be used to assure proper soil conditions and balanced levels of plant nutrition.

V. Irrigation

Make certain that the irrigation water being applied is penetrating to a depth slightly greater than the root zone of the plants being grown. Water with a frequency needed to maintain moist soil at all times - never wet for long periods and never let the soil dry out.

Application Notes

The application instructions listed below apply only if the material(s) is recommended in this report on page 1. Materials not included in the recommendations are excluded either because the analyses data did not indicate a need or the analysis to determine if a need existed was not requested.

Organic Materials

Nitrolized redwood compost is preferred but other organic mixes may be substituted depending upon the site requirements. Organic materials should be spread uniformly over the surface soils and when possible should be incorporated to a depth of two to three inches.

Limestone, Dolomite & Sulfur

These materials should be broadcast uniformly over the surface soils and then incorporated to a depth of two to three inches.

Gypsum

This material should be broadcast uniformly over surface soils for water penetration. For best results do not incorporate.

Preplant Phosphorous, Zinc, Manganese, Iron & Copper

These materials should be broadcast uniformly over the surface soils and then incorporated to a depth of two to three inches. Post-plant applications can be surface applied for water penetration.

Nitrogen, Potassium & Magnesium

These materials are highly water soluble and can be applied uniformly over the surface soils for water penetration or they can be incorporated with the other materials. Magnesium sources for plant nutrition include Epsom salts (Magnesium Sulfate), and the double salt of Potasium-Magnesium Sulfate (Sulfate of Potash-magnesia).

FRUIT GROWERS LABORATORY, INC.

ANALYTICAL CHEMISTS

September 9, 2005

Ninyo & Moore
5710 Ruffin Road
San Diego, CA 92123-1013

Lab ID : SP 0509021-001
Customer ID : 2-18569

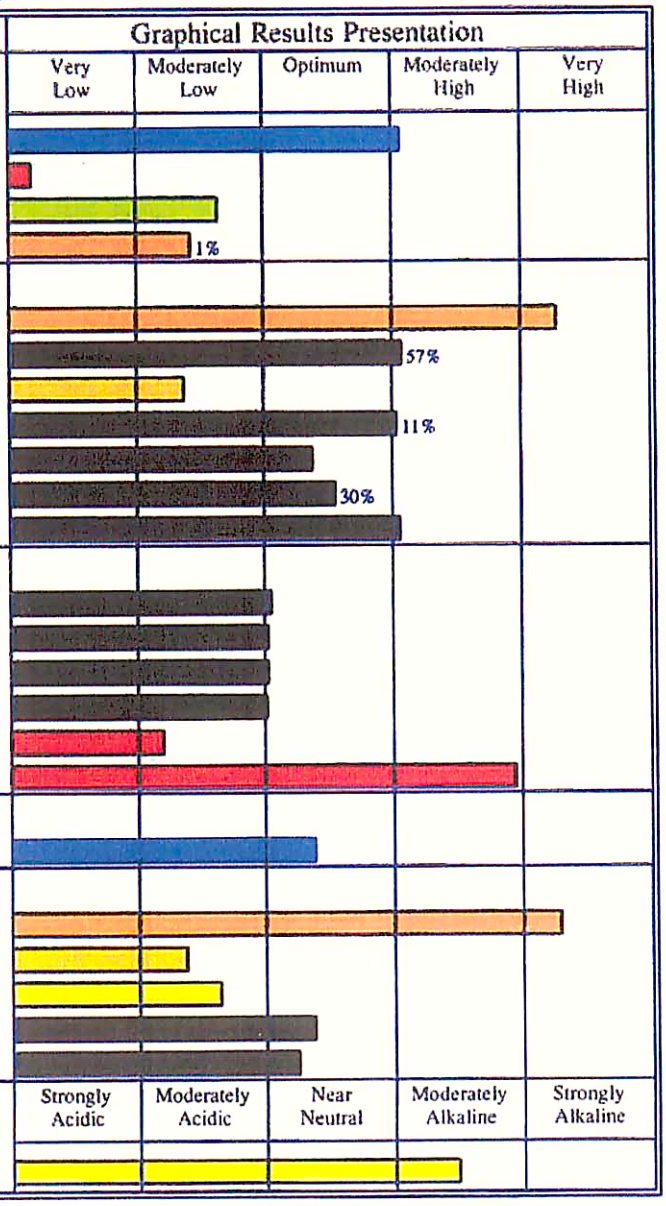
Sampled On : August 2, 2005
Sampled By : Ninyo and Moore
Received On : August 30, 2005
Depth : 0-60"
Meth Irrg. : S.S. Sprinklers

Description : Detention Basin Composite
Project : McDowell Road Storm Drain

LANDSCAPE SOIL ANALYSIS

Test Description	Result	Units	Optimum Range
Primary Nutrients			
Nitrate-Nitrogen	104	Lbs/AF	58 - 98
Phosphorus-P_2O_5	30	Lbs/AF	280 - 370
Potassium-K_2O (Exch)	490	Lbs/AF	1060 - 2650
Potassium-K_2O (Sol)	90	Lbs/AF	130 - 500
Secondary Nutrients			
Calcium (Exch)	20900	Lbs/AF	13500 - 18000
Calcium (Sol)	1890	Lbs/AF	130 - 610
Magnesium (Exch)	680	Lbs/AF	1370 - 2730
Magnesium (Sol)	220	Lbs/AF	0 - 140
Sodium (Exch)	320	Lbs/AF	0 - 1290
Sodium (Sol)	1140	Lbs/AF	0 - 2070
Sulfate	4880	Lbs/AF	820 - 4660
Micro Nutrients			
Zinc	12.0	Lbs/AF	3.6 - 174
Manganese	13.2	Lbs/AF	7.2 - 261
Iron	33.2	Lbs/AF	27.4 - 290
Copper	1.6	Lbs/AF	1.1 - 44.8
Boron	1.1	Lbs/AF	1.9 - 7.9
Chloride	1460	Lbs/AF	39 - 748
CEC	28.1	meq/100g	5 - 65.0
% Base Saturation			
CEC - Calcium	92.9	%	60 - 80.0
CEC - Magnesium	5.0	%	10 - 20.0
CEC - Potassium	0.93	%	2 - 5.00
CEC - Sodium	1.25	%	0 - 5.00
CEC - Hydrogen	0.00	%	0 - 3.00
pH	7.94	---	6.5 - 7.50

Graphical Results Presentation



Good — Problem — Indicates physical conditions and/or phenological and amendment requirements.

Note: Color coded bar graphs have been used to provide you with 'AT-A-GLANCE' interpretations.

Corporate Offices & Laboratory
PO Box 272 / 853 Corporation Street
Santa Paula, CA 93061-0272
TEL: 805/392-2000
FAX: 805/525-4172

Office & Laboratory
2500 Stagecoach Road
Stockton, CA 95215
TEL: 209/942-0181
FAX: 209/942-0423

Field Office
Visalia, CA
TEL 559/734-9473
FAX 559/734-8435
Mobile 559/737-2399

September 9, 2005

Ninyo & Moore

Lab ID : SP 0509021-001
Customer ID : 2-18569
Description : Detention Basin Composite

LANDSCAPE SOIL ANALYSIS

Test Description	Result	Units	Optimum Range	Graphical Results Presentation
Others				Satisfactory / Possible Problem / Moderate Problem / Increasing Problem
Soil Salinity	3.72	mmhos/cm	0.5 - 2.00	
SAR	3.3		0 - 6.0	
Limestone	8.5	%	0 - 0.5	
Lime Requirement	0	Tons/AF	2.5 - 3.50	0 / 1 / 2 / 3 / 4 / 5 / 6
Moisture	3.4	%	6.1 - 18.2	Very Low / Moderately Low / Optimum / Moderately High / Very High
Saturation	24.3	%	40 - 50.0	Loamy Sand / Sandy Loam / Loam / Silt Loam / Clay Loam / Clay / Organic

Good — Problem — Indicates physical conditions and/or phenological and amendment requirements.

Note: Color coded bar graphs have been used to provide you with 'AT-A-GLANCE' interpretations.

Soil pH & Limestone levels are important to consider when making plant selections. Soil pH levels above 7.0 are not suitable for acid loving plants. Soils containing limestone are not suitable for plants sensitive to Limestone.

FRUIT GROWERS LABORATORY, INC.

William L. Pidduck, Vice President

WLP:JRJ

APPENDIX E

PROJECT PHOTOGRAPHS

Photo 1. L-1 - View of pit at depth of 4 feet.

Photo 2. L-1 - Material causing difficulty in excavation at 4 feet.

Photo 3. L-1 - View of test pit at 5 feet.

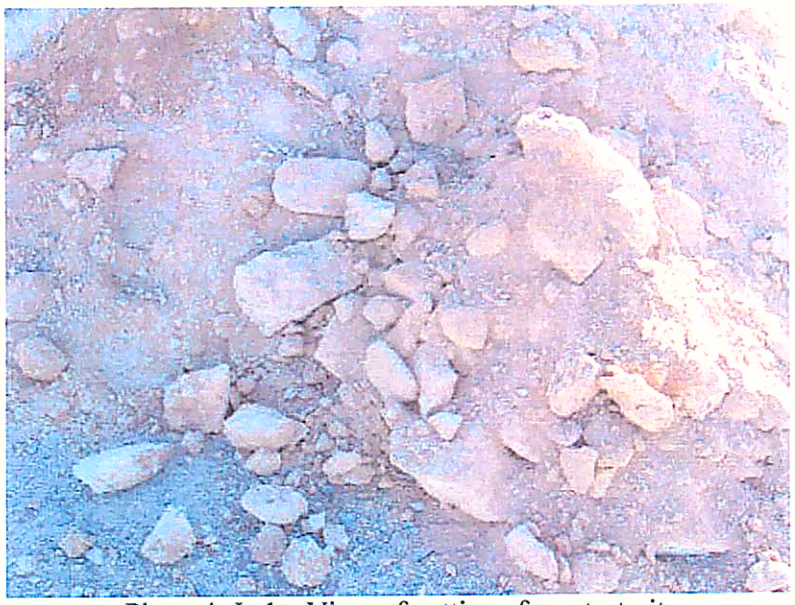


Photo 4. L-1 - View of cuttings from test pit.

Photo 5. L-1 - Pit at depth of 10.9 feet.

Photo 6. L-1 - View of pit at depth of 10.9 feet.

Photo 7. L-2 - View of pit at 6.9 feet.

Photo 8. L-2 - View of pit at 6.9 feet.

Photo 9. L-4 - Well-cemented layer with teeth marks.

Photo 10. L-4 - View of pit at 7.5 feet.

Photo 11. L-4 - Piece of well cemented layer with teeth mark.

Photo 12. L-4 - View of pit at 10.9 feet.

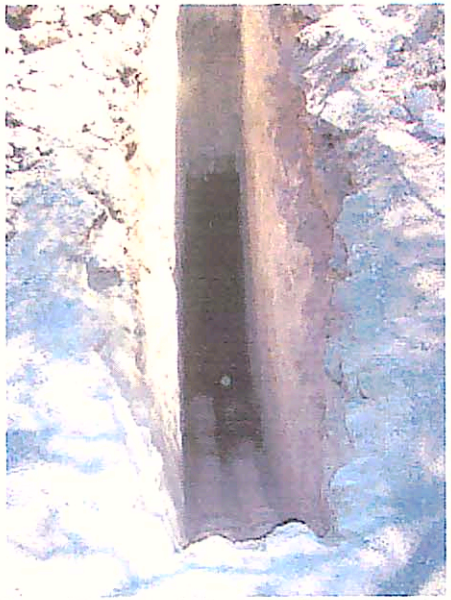


Photo 13. L-4 - View of pit at 10.9 feet.

Photo 14. L-3 - Spoils pile with large well-cemented clasts.

Photo 15. L-3 - Walls of test pit.

Photo 16. L-5 - View of test pit.

Photo 17. L-5 - Walls of test pit.

Photo 18. B-1A - Mini-sonic drill rig.

Photo 19. B-1A - Location of B1-A.

Photo 20. B-1A - Sample bags.

Mc DOWELL ROAD AND STORM DRAIN DESIGN
CONTRACT FCD 2004C052

MANHOLE #	RIM ELV.	NORTH	SOUTH	WEST	EAST
677	1649.40	-8.09	-8.13		
818	1643.82	-9.21	-9.22		
828	1631.57			-5.32	-5.35
970	1641.32	-12.00		-12.04	-12.05
1084	1648.94	-8.50	-8.52		-8.51
1294	1656.52			-9.99	-9.88
1390	1664.02			-9.13	-9.03
2110	1680.24			-8.94	-8.89
2278	1689.13			-9.54	-9.72
2380	1692.69	-4.46	-4.44		-4.34
2399	1691.53		-3.25		-3.27
2635	1697.36			-4.92	-4.29
5117	1816.05	(NOTE 1)			
5193	1759.62	(NOTE 2)			

NOTES:

#1 Manhole filled with dirt, manhole invert taken at top of dirt center manhole no pipes visible, dirt invert -6.5 (El=1809.55).

#2 Manhole filled with water, manhole invert taken bottom of manhole no pipes visible invert -9.87 (El=1749.75)

Tree Inventory
McDowell Road Basin and Storm Drain Design

2040	897185.6	777444.8	1672.843	SG	5'	1
2254	897212.7	777604.8	1675.999	FPV	2"	2
2097	897194.3	777663	1676.72	SG	10'	3
2255	897195.5	777734.2	1678.026	IW	12"	4
2104	897205.4	777771.7	1679.576	FPV	4"	5
2122	897188.9	777911.6	1681.429	SG	6'	6
2121	897192.1	777912.9	1681.248	SG	40'	7
2106	897217.3	777753.7	1678.91	FPV	2"	8
2265	897219.5	777924.3	1682.589	MQ	1.5"	9
2123	897191.3	777923.7	1681.86	SG	9'	10
2126	897198	777948.3	1683.038	SG	15'	11
2266	897217.4	778008.7	1684.348	FPV	5"	12
2267	897208.6	778024.7	1684.638	BPV	2"	13
2268	897218.7	778041.5	1685.083	BPV	6"	14
2269	897184.8	778120.8	1684.751	SG	8'	15
2283	897192.5	778317.2	1688.491	MQ	8"	16
2285	897198.3	778342.8	1687.616	FPV	8"	17
2300	897218.8	778385.9	1690.327	BPV	16"	18
2318	897196.3	778407.5	1690.151	MQ	8"	19
2332	897198.5	778478.4	1692.089	FPV	14"	20
2348	897216.2	778502.2	1692.486	FPV	20"	21
2462	897217.4	778504.4	1692.885	FPV	16"	22
2465	897213.5	778580.3	1694.298	MQ	4"	23
2466	897206.6	778596.9	1694.399	MQ	4"	24
2588	897201	778770.9	1698.79	SG	22'	25
2746	897217	778932.1	1699.501	BPV	6"	26
2757	897224.1	779093.7	1704.53	FPV	4"	27
2894	897222.7	779505.9	1712.231	FPV	18"	28
2901	897222.4	779523	1712.58	FPV	12"	29
2904	897211.7	779530.2	1712.074	FPV	8"	30
2909	897219.3	779547.9	1713.03	FPV	3"	31
2910	897210.1	779567.2	1712.668	FPV	18"	32
2938	897195.8	779638	1712.419	FPV	16"	33
3155	897186.3	780000.6	1722.038	FPV	14"	34
3204	897209.9	780232.3	1728.404	FPV	12"	35
3249	897175.2	780422.6	1731.474	FPV	14"	36
3252	897188.9	780447.2	1733.019	SG	10'	37
3253	897181.1	780471.6	1733.742	FPV	14"	38
3254	897207.5	780469.1	1733.447	FPV	6"	39
3529	897202.6	780773.5	1740.379	FPV	4"	40
3530	897204.7	780777.8	1740.478	SG	4'	41
6131	897211.8	780797.8	0	SG	6'	42
3531	897208.3	780796.3	1740.778	BPV	3"	43
3532	897196.3	780802.8	1741.439	FPV	3"	44
3540	897192.4	780828.7	1742.21	SG	8'	45
3544	897212.2	780834.9	1741.626	FPV	12"	46
3571	897186.6	780887.8	1743.685	SG	8'	47
3574	897211.4	780914.3	1743.9	FPV	14"	48
3582	897190.2	780985.7	1745.216	FPV	5"	49
3583	897190.4	781008.9	1745.991	BPV	10"	50
3604	897207.7	781080.1	1748.071	FPV	6"	51
3791	897290.4	781314.2	1754.934	IW	20"	52

Tree Inventory
McDowell Road Basin and Storm Drain Design

3709	897285.4	781213.8	1752.993	FPV	10"	53
3700	897284.2	781160.7	1751.372	FPV	18"	54
3697	897286.6	781129.6	1750.217	FPV	3"	55
3696	897284.5	781103.7	1749.228	FPV	24"	56
3677	897287.8	781050.9	1748.185	BPV	5"	57
3793	897288.1	781060.6	1748.599	BPV	4"	58
3678	897268.6	781045.5	1747.787	BPV	8"	59
3675	897288.5	781035.3	1748.099	BPV	10"	60
3674	897271.2	781037.5	1747.845	FPV	8"	61
3649	897267.3	780928.4	1744.344	MQ	5"	62
3641	897288.1	780921.2	1746.437	SG	15'	63
3639	897281.1	780908.5	1745.872	SG	4'	64
3637	897270.1	780906.1	1744.04	FPV	1.5"	65
3513	897271.1	780791.3	1741.153	AC	8"	66
3470	897296.4	780760.1	1740.317	FPV	20"	67
3445	897270	780700.6	1739.173	FPV	6"	68
3545	897285.5	780697.1	1739.306	EUC	12"	69
3557	897272	780590.2	1736.59	BPV	12"	70
3558	897273.2	780585	1736.464	BPV	3"	71
3559	897293.2	780532.1	1735.566	IW	3"	72
6137	897302.8	780113.2	0	IW	14"	73
3325	897288.4	780105.6	1725.786	FPV	18"	74
6129	897284.8	780090.7	0	FPV	16"	75
3005	897275.4	779932.9	1721.336	FPV	3"	76
3006	897277.9	779927.7	1721.484	FPV	4"	77
3014	897274	779886.8	1720.589	FPV	4"	78
3023	897277.7	779843.7	1720.169	FPV	2"	79
3022	897284.2	779854.6	1721.138	FPV	2"	80
3024	897292.8	779834.3	1720.839	MQ	3"	81
3025	897298.3	779812.5	1720.431	MQ	2"	82
3041	897300.9	779762.3	1718.48	FPV	18"	83
3046	897303	779715.1	1716.381	FPV	8"	84
6126	897279.8	779690.9	0	BPV	8"	85
3060	897312	779665.1	1715.138	FPV	16"	86
3061	897296.8	779657.2	1716.137	FPV	3"	87
6127	897273	779651.9	0	BPV	4"	88
6128	897276.2	779637.9	0	BPV	4"	89
3083	897279.7	779619.9	1716.105	BPV	6"	90
3084	897277.1	779581.2	1714.044	BPV	10"	91
3115	897300.8	779485.2	1714.399	SG	7'	92
3124	897308.2	779421	1713.465	SG	25'	93
3125	897302	779388.1	1711.335	FPV	10"	94
3126	897296.1	779360.7	1710.524	FPV	10"	95
3127	897286.4	779359.9	1709.7	IW	12"	96
2794	897305.1	779311.5	1710.664	SG	35'	97
2812	897298.7	779186.9	1707.285	SG	30'	98
2810	897277.7	779180.3	1706.63	FPV	4"	99
2820	897296.6	779097.1	1705.003	FPV	18"	100
2823	897278.1	779058	1704.143	FPV	4"	101
2828	897283.2	779033.1	1703.909	FPV	6"	102
2847	897314.2	779012.9	1704.608	SG	25'	103
2852	897275.5	778925.3	1702.074	FPV	4"	104

Tree Inventory
McDowell Road Basin and Storm Drain Design

2859	897317.5	778892.3	1702.433	FPV	14"	105
2605	897311	778845	1701.245	SG	30'	106
2606	897322	778822.3	1700.683	SG	25'	107
2607	897320.6	778821	1700.592	SG	22'	108
2664	897318.5	778684.9	1698.104	SG	30'	109
2684	897323.6	778641	1694.371	MQ	3"	110
2683	897305.6	778626.6	1696.333	MQ	5"	111
2717	897321.3	778590.9	1695.145	BPV	4"	112
2718	897320.2	778535.2	1695.846	MQ	3"	113
2720	897314	778497.2	1695.203	MQ	8"	114
2719	897315	778520.4	1695.794	SG	6'	115
2721	897314.2	778433.7	1694.428	MQ	10"	116
2722	897307.3	778411	1693.73	MQ	10"	117
2723	897297.9	778358.9	1691.807	MQ	12"	118
2724	897298.1	778318	1691.632	MQ	10"	119
2725	897303.3	778303.5	1691.404	BPV	6"	120
2726	897278.4	777820.9	1680.684	FPV	12"	121
4615	897278.6	777681.8	1677.435	FPV	2"	122
2727	897296	777665.7	1676.008	FPV	2"	123
2728	897294.1	777664.4	1675.886	IW	2"	124
2729	897299.4	777654.9	1676.949	FPV	8"	125
4616	897311.4	777667.8	1676.737	FPV	10"	126
4617	897293.2	777627	1676.403	FPV	30"	127
2730	897281.6	777615.4	1676.109	IW	5"	128
4619	897281.8	777606.5	1675.41	FPV	3"	129
4618	897280.5	777598.8	1675.703	FPV	4"	130
4620	897281.5	777591.2	1675.14	FPV	2"	131
4621	897280.4	777585.1	1675.069	FPV	3"	132
4622	897321.2	777577.3	1677.561	SG	20'	133
4623	897330.7	777538.3	1674.56	FPV	10"	134
4625	897315.2	777490	1673.442	SG	14'	135
4626	897322.1	777459.8	1672.902	SG	28'	136
4629	897320.9	777455.3	1672.534	FPV	4"	137
4628	897310.4	777437.7	1672.99	FPV	10"	138
4627	897305.6	777419.3	1673.184	FPV	3"	139
1808	897320.1	777366.6	1672.214	BPV	4"	140
1830	897301	777334.3	1670.635	BPV	1"	141
1834	897306.2	777317.4	1670.206	BPV	3"	142
1768	897328.1	777318.1	1670.195	FPV	4"	143
1839	897293.9	777281.8	1669.139	BPV	5"	144
1741	897311.3	777267.2	1669.116	BPV	4"	145
NOT USED						146
NOT USED						147
NOT USED						148
NOT USED						149
1739	897294.6	777246.3	1668.73	BPV	6"	150
1719	897310.7	777223.8	1668.097	BPV	3"	151
1718	897294.5	777214.8	1668.145	BPV	6"	152
1690	897294.5	777183.1	1667.55	FPV	4"	153
1692	897293.5	777166.5	1667.045	FPV	4"	154
1667	897293.7	777112.6	1665.644	FPV	4"	155
1435	897292.7	777088.8	1665.189	FPV	4"	156

Tree Inventory
McDowell Road Basin and Storm Drain Design

1450	897320.4	777070.9	1667.242	BPV	4"	157
1449	897316.3	777051.9	1667.061	SG	12'	158
1502	897295.3	776988.2	1664.377	BPV	3"	159
1474	897315.8	776976.6	1665.272	BPV	4"	160
4633	897318.6	776952.7	1663.973	FPV	4"	161
1506	897310.1	776938.9	1665.025	MQ	5"	162
1513	897290	776895.9	1662.141	AC	3'	163
4634	897316.6	776693.3	1661.792	SG	25'	164
1575	897306.8	776515.3	1657.789	FPV	8"	165
1576	897318.5	776501.3	1658.314	SG	17'	166
1607	897307.8	776309.1	1651.838	FPV	18"	167
6125	897344.2	776254.8	1653.524	FPV	12"	168
1612	897329.2	776238.8	1653.524	FPV	24"	169
1619	897299.5	776213.8	1653.169	FPV	14"	170
1620	897305.1	776196.4	1653.016	FPV	12"	171
724	897344.2	776134	1649.934	FPV	10"	172
550	897419.6	775798.6	1645.346	FPV	12"	173
6136	897371.9	775716.2	0	FPV	18"	174
427	897395	775680.2	1642.727	FPV	6"	175
428	897390.2	775638.6	1642.265	FPV	3"	176
429	897388.6	775631.4	1642.124	SG	12.0'	177
375	897386.4	775566.1	1640.208	FPV	12"	178
384	897431.7	775576.3	1639.035	MQ	3"	179
323	897393.7	775482.2	1641.09	SG	18.0'	180
328	897423	775428.5	1636.046	BPV	3"	181
201	897389.7	775283.1	1635.702	FPV	10"	182
166	897370.8	775229.9	1634.545	IW	4"	183
165	897382.3	775211	1631.24	BPV	8"	184
6132	897356.4	775139.1	0	MQ	8"	185
6133	897328.7	775088.6	0	AC	4"	186
6134	897350.4	775097.8	0	MQ	3"	187
138	897324	775122.3	1631.739	AC	3"	188
139	897326.4	775149.1	1632.497	BPV	5"	189
140	897322.4	775176.5	1633.278	FPV	10"	190
163	897323.5	775191.2	1634.714	MQ	8"	191
160	897336.4	775211.6	1634.164	IW	10"	192
164	897346.8	775210.2	1633.98	SG	18'	193
159	897336.3	775237.1	1634.182	DMP	6"	194
193	897340.1	775280	1635.886	BPV	6"	195
194	897333.2	775300.9	1636.113	MQ	4"	196
195	897326.4	775324.2	1637.789	AC	4"	197
198	897334.7	775351.8	1637.834	AC	6"	198
256	897335	775376.9	1637.616	AC	4"	199
255	897321.1	775395.9	1638.148	DMP	12"	200
254	897321.2	775439.8	1638.831	DMP	6"	201
6130	897322.7	775462.1	0	DMP	8"	202
373	897328.3	775540.3	1640.146	BPV	8"	203
374	897329.4	775563.6	1640.676	BPV	10"	204
368	897308.3	775591.7	1641.879	SG	20.0'	205
365	897321.7	775614.2	1641.454	DMP	8"	206
433	897323.1	775637.4	1641.578	DMP	8"	207
432	897337.9	775655.3	1642.26	FPV	18"	208

Tree Inventory
McDowell Road Basin and Storm Drain Design

460	897318.1	775667.4	1641.929	DMP	8"	209
461	897319.9	775683.6	1642.052	AC	3"	210
463	897320.6	775710.7	1642.766	AC	4"	211
483	897318.3	775756.7	1643.685	AC	6"	212
488	897316.3	775781.3	1644.269	MQ	8"	213
517	897323.2	775827.8	1645.297	MQ	8"	214
518	897323.3	775841.6	1645.036	BPV	4"	215
519	897321.8	775861.2	1645.439	BPV	4"	216
520	897317	775877.7	1645.464	MQ	5"	217
521	897317.5	775902.7	1645.774	MQ	4"	218
522	897314.1	775922.1	1646.128	AC	5"	219
523	897316.1	775944.4	1646.665	DMP	8"	220
1949	897219.6	777226.8	1668.539	DMP	3"	221
1957	897222.2	777251.4	1668.069	DMP	2"	222
1928	897228.8	777190.1	1667.237	FPV	3"	223
1404	897197.2	777054.6	1665.227	SG	12'	224
1403	897198.3	777048	1664.79	SG	10'	225
4632	897189.5	776996.8	1663.55	IW	26"	226
4631	897194.4	776943.5	1661.307	FPV	20"	227
1362	897207.3	776913.5	1662.847	IW	1.5"	228
1356	897221.5	776881.7	1661.97	FPV	8"	229
1355	897204.6	776864.9	1662.652	FPV	3"	230
1354	897200.1	776847.8	1662.68	FPV	2"	231
1341	897207.9	776799.9	1660.556	SG	14'	232
1331	897188.8	776718.5	1656.894	FPV	20"	233
1323	897217.5	776682.1	1659.121	FPV	3"	234
1321	897211.3	776661.9	1659.02	FPV	3"	235
1320	897208.1	776650.2	1659.065	IW	2"	236
1291	897224.7	776503.2	1655.696	FPV	8"	237
1268	897208.2	776396.5	1653.335	FPV	18"	238
1267	897199.8	776382.3	1652.349	FPV	10"	239
1269	897203.8	776405.5	1652.859	FPV	6"	240
1265	897199.2	776372.6	1652.243	FPV	8"	241
1266	897201	776379.5	1652.419	FPV	4"	242
1253	897198.6	776250.2	1652.139	FPV	12"	243
739	897197.4	776152.8	1648.868	FPV	8"	244
1230	896741.5	776031.7	1641.494	SG	14.0'	245
1232	896741.3	775894.5	1637.125	FPV	10"	246
1231	896741.6	775905.2	1636.446	FPV	3"	247
1235	896759.1	775789.9	1635.787	FPV	4"	248
1234	896783.4	775787.4	1634.895	FPV	14"	249
1205	896778	775767	1635.929	SG	35.0'	250
1193	896741.9	775679	1634.111	BPV	3"	251
1194	896774.6	775624.9	1633.403	MQ	3"	252
1196	896785.6	775610.7	1633.281	MQ	5"	253
1197	896802.1	775615.5	1633.9	MQ	5"	254
1198	896792.6	775653.8	1634.156	BPV	3"	255
6277	896808.1	775664.1	1634.239	BPV	4"	256
6278	896793.7	775679.1	1634.584	BPV	4"	257
1199	896825.7	775644.1	1634.522	AC	3"	258
6345	896863.7	775655	1634.792	MQ	5"	259
1201	896873.3	775637.7	1634.994	AC	3"	260

Tree Inventory
McDowell Road Basin and Storm Drain Design

1202	896882.9	775646.4	1635.189	AC	5"	261
1191	896878.2	775680.5	1636.275	SG	15.0'	262
1203	896917.8	775663.4	1635.627	BPV	6"	263
1204	896945.3	775670.6	1634.779	BPV	6"	264
1189	896988.8	775690.5	1639.015	IW	18"	265
1185	897009.8	775680.8	1637.05	BPV	3"	266
1184	897032.9	775683.8	1638.503	AC	3"	267
1188	897023.7	775666.3	1636.591	MQ	8"	268
1176	897091.5	775677.8	1637.458	FPV	3"	269
1175	897106.8	775670.1	1637.042	BPV	10"	270
1064	897183.5	776012.8	1648.863	SG	22'	271
1049	897197.8	775978.3	1646.492	AC	3"	272
1046	897199.5	775956.2	1646.239	AC	3"	273
1213	897180.9	775945.6	1645.641	IW	18"	274
1037	897197.5	775917.3	1645.459	DWI	3"	275
1035	897197.1	775900.5	1645.223	DWI	6"	276
1026	897194.6	775883.5	1645.028	DWI	5"	277
1025	897208.7	775881.5	1645.472	DWI	3"	278
1023	897195.7	775855.6	1644.64	AC	4"	279
1009	897209	775826.9	1644.995	SG	10'	280
1008	897195.4	775821.5	1644.576	FPV	4"	281
1007	897206.5	775807.8	1644.017	FPV	3"	282
1004	897209	775764	1643.635	IW	5"	283
1179	897153.3	775769.3	1641.95	IW	12"	284
324	897369	775496.6	1639.692	FPV	14"	285
325	897349.4	775469.7	1639.503	FPV	18"	286
998	897200	775715.1	1643.266	IW	3"	287
6124	897199.4	775733.5	0	IW	1"	288
1171	897178	775691.2	1641.678	BPV	7"	289
1172	897166.4	775665.6	1639.861	BPV	6"	290
6138	897177.5	775664.1	0	DWI	3"	291
6139	897199	775661.4	0	DWI	3"	292
986	897199.1	775677.5	1642.034	DWI	2"	293
1174	897128	775669.6	1638.548	FPV	5"	294
1173	897155.7	775668.7	1639.902	SG	10'	295
1180	897075.4	775791.9	1641.124	FPV	20"	296
1181	897037.1	775764.9	1639.618	FPV	18"	297
1182	897040.6	775757.4	1640.185	SG	8'	298
1208	896915.1	775763.6	1641.01	IW	12"	299
1192	896859.6	775728.7	1638.315	SG	7'	300
1211	897111.8	775943.4	1645.855	FPV	10"	301
1210	896991.2	775861.9	1643.527	FPV	14"	302
6280	896744.7	775776.4	1635.039	FPV	12"	303
6281	896720.7	775770	1634.862	FPV	14"	304
6283	896683	775769	1633.247	SG	16'	305
6284	896680.1	775754.5	1633.495	IW	30"	306
6272	896679.6	775658.3	1631.847	MQ	8"	307
6271	896673.8	775647.3	1632.144	MQ	6"	308
6273	896695.3	775643.9	1632.196	MQ	3"	309
6275	896734.5	775663	1632.703	BPV	2"	310
6276	896721.6	775680.1	1634.307	BPV	2"	311
6269	896626.2	775665.9	1631.169	AC	3"	312

Tree Inventory
McDowell Road Basin and Storm Drain Design

6270	896637.4	775639.5	1631.705	BPV	3"	313
6268	896604	775644.2	1631.908	BPV	4"	314
6267	896601.8	775666	1632.62	BPV	3"	315
6266	896585.2	775656.1	1631.582	BPV	3"	316
6264	896572.7	775690.6	1629.78	FPV	12"	317
6261	896598.8	775724.1	1630.974	FPV	14"	318
6260	896608.2	775728.4	1631.453	FPV	8"	319
6263	896598.5	775735.6	1631.048	FPV	8"	320
6259	896623.1	775753.4	1631.113	FPV	12"	321
6256	896627.5	775769.3	1632.84	FPV	16"	322
6257	896640.9	775761.1	1632.159	FPV	8"	323
6258	896636.2	775754.3	1632.231	FPV	18"	324
6255	896636.7	775811.3	1636.081	FPV	16"	325
6254	896669.6	775841.8	1635.657	FPV	30"	326
6253	896657.3	775846.2	1636.049	FPV	36"	327
6252	896644.8	775868.5	1636.962	IW	22"	328
6286	896715.1	775859.6	1635.15	FPV	14"	329
6248	896652.4	775925.4	1637.326	FPV	8"	330
6247	896711.1	776014.1	1641.16	FPV	30"	331
1236	896822	775839.2	1637.267	IW	48"	332
1237	896844.9	775822.1	1636.364	FPV	14"	333
1238	896871.9	775853.4	1637.629	FPV	12"	334
1239	896828.1	775896.9	1641.104	SG	16.0'	335
1240	896815.3	775938.6	1640.783	SG	20.0'	336
1245	896891.6	775862.5	1636.923	FPV	12"	337
1247	896929.4	775887	1638.192	IW	18"	338
1248	896946.3	775896.7	1640.219	FPV	12"	339
1249	896950.5	775913.8	1638.021	FPV	8"	340
1250	896959.1	775924.3	1639.063	FPV	24"	341
1251	896961.9	775946.6	1639.251	FPV	4"	342
1252	896967	775954.9	1639.569	FPV	6"	343
1222	896946.7	775978.9	1643.298	FPV	14"	344
1223	896939.4	775988	1643.172	SG	10.0'	345
1244	896910.9	775950.3	1641.472	SG	20.0'	346
1218	896975.4	775986.3	1643.162	FPV	12"	347
1221	896990.4	775989.7	1642.514	FPV	10"	348
1220	897000.1	775977.6	1640.454	FPV	4"	349
1219	897014.8	775985.5	1641.59	FPV	12"	350
1217	897013.1	776018.3	1641.866	FPV	16"	351
1215	897028.9	776023.1	1642.212	FPV	8"	352
1216	897031.1	776023	1642.331	FPV	8"	353
1214	897037.2	776025.8	1642.112	FPV	8"	354
1226	896867.9	776021.9	1642.009	FPV	18"	355
1227	896869.4	776022.9	1642.187	SG	25'	356
1228	896860.3	776015.9	1641.541	FPV	12"	357
5638	897505.8	781338	1758.178	FPV	12"	358
6135	898031.1	781304.8	0	SG	14'	359
5614	898039.1	781312.8	1769.707	SG	16'	360
5608	898075.8	781315	1770.597	SG	18'	361
5602	898119.4	781328.8	1772.062	SG	8'	362
5601	898126.9	781320.6	1772.113	SG	16'	363
5603	898120.5	781313.4	1771.733	MQ	8"	364

Tree Inventory
McDowell Road Basin and Storm Drain Design

5338	898259.4	781397.8	1776.468	BPV	14"	365
5306	898122.4	781391.1	1772.372	AC	3"	366
5305	898069.8	781393.8	1771.147	MQ	12"	367
5625	898051.2	781393.3	1770.226	MQ	16"	368
5266	897951.9	781394	1767.809	BPV	14"	369
5265	897933.8	781395.5	1767.446	BPV	16"	370
5262	897907.7	781393.9	1766.865	MQ	18"	371
5261	897892.9	781395.2	1766.558	MQ	10"	372
5260	897877.4	781397.1	1766.384	MQ	12"	373
5238	897829.5	781393.1	1765.139	MQ	24"	374
5222	897791.1	781394.5	1764.315	BPV	10"	375
5221	897776.7	781394.8	1763.895	BPV	8"	376
5220	897755.1	781397.8	1763.706	BPV	14"	377
5214	897652	781392.7	1761.729	BPV	12"	378
5195	897638.9	781398.7	1761.474	BPV	12"	379
5194	897620.5	781393.9	1760.891	BPV	12"	380
5186	897610.6	781396.3	1760.666	BPV	8"	381
5185	897593.3	781393.7	1760.44	BPV	8"	382
5184	897582.1	781395.2	1760.335	BPV	12"	383
5164	897504.8	781395	1758.989	AC	8"	384
5163	897489.9	781394.5	1758.176	AC	12"	385
5888	897345.7	781392.8	1756.917	AC	16"	386
3978	897282.2	781433.1	1756.886	MQ	20"	387
3977	897281.5	781446.2	1757.295	MQ	12"	388
3976	897283.4	781460.3	1757.568	MQ	18"	389
6110	897284.5	781510.5	1759.08	MQ	18"	390
3939	897287.7	781554.1	1760.251	AC	3"	391
3934	897282.1	781585.1	1760.011	AC	8"	392
3933	897282.6	781592.5	1760.406	AC	4"	393
3932	897289.1	781595.2	1760.797	AC	3"	394
3925	897292.4	781627.9	1761.41	AC	8"	395
3893	897291.7	781709.2	1763.023	MQ	14"	396
3892	897291.3	781727	1763.472	AC	12"	397
3891	897282.2	781742.9	1763.274	AC	14"	398
3890	897286	781760.5	1763.475	AC	12"	399
3871	897286.5	781850.5	1765.37	AC	14"	400
3870	897284	781861.1	1765.602	AC	16"	401
3998	897207.4	781913.8	1765.729	FPV	4"	402
6113	897170.9	781816.9	1762.718	SG	9'	403
3856	897202.8	781801.9	1763.653	IW	10"	404
3850	897213.5	781758.5	1762.456	FPV	14"	405
3845	897201.5	781692.5	1761.966	FPV	16"	406
3844	897202.3	781677.8	1761.729	FPV	12"	407
3843	897201.3	781659.2	1761.569	FPV	4"	408
6114	897173.9	781423.2	1754.856	SG	25'	409

Jensen, David

From: Tom Lavalette [tlavalette@engall.com]
Sent: Friday, September 30, 2005 9:46 AM
To: Jensen, David
Subject: McDowell Road Basin and Storm Drain Design
Attachments: Mcdowell-Hawes.zip; mcdowell.asc

Dave,
On our meeting on Wednesday the 21st EA hand delivered to KHA copies of all NGS points used, city of Mesa bench marks and manhole inverts, per your request we placed on the attached AutoCAD drawing the right of way per the county assessors map. EA updated the AutoCAD file base and drawing file showing the additional 150' added to the south end of basin at Sossaman and McDowell, Also corrected wall opening sizes and all trees labeled per tree inventory. In addition I am attaching an asc file of all point for your use. This should give you everything you requested, if you need anything else please don't hesitate to contact me.

Thank you,

Thomas Lavalette, RLS.
Vice President of Surveying
Engineering Alliance, Inc.
Office: 602-248-4203
Cell: 602-757-6032
Fax: 602-248-4219
Email: tlavalette@engall.com

CITY OF MESA SURVEY BENCHMARKS

N-S X-Street	E-W X-Street	NEW ELEV	OLD ELEV	Description
Country Club	Baseline	1210.71	1210.09	Brass Tag T.C. N.E. corner
Country Club	Southern	1217.07		Brass Tag T.C. N.W. corner
Country Club	Broadway	1233.65		Brass Tag T.C. S.E. corner
Country Club	Broadway		1230.08	Ch. Sq. T.C. S.W. Rd to W. Broadway
Country Club	University	1243.48	1242.82	Brass Tag T.C. N.W. corner
Country Club	Brown	1250.29	1249.6	Brass Tag T.C. N.W. corner
Country Club	McKellips	1217.72	1217.01	Brass Tag T.C. S.E. corner
Mesa	Baseline	1213.42		Brass Tag T.C. N.W. corner
Mesa	Southern	1220.15		Brass Tag T.C. N.E. corner
Mesa	Southern		1222.09	Ch. Sq. Irr Works N.W. corner
Mesa	Broadway	1233.52	1232.93	Brass Tag T.C. N.E. corner
Mesa	University	1242.6	1241.97	Brass Tag T.C. S.W. corner
Mesa	Brown	1251.25	1250.58	Brass Tag T.C. S.E. corner
Mesa	McKellips	1226.49		Brass Tag T.C. S.E. corner
Mesa	McKellips		1226.41	Ch. Sq. T.C. N.E. corner
Stapley	Baseline	1221.71		Brass Tag T.C. N.E. corner
Stapley	Baseline		1223.25	Irr Box S.W. corner
Stapley	Southern	1225.13		Ch. Sq. Brass Tag T.C. N.E. corner
Stapley	Southern		1227.69	B.C. Irr Works S.W. corner
Stapley	Broadway	1233.57	1233.13	Brass Tag T.C. N.E. corner
Stapley	Main	1238.12		Brass Tag N.E. corner
Stapley	Main		1237.66	Ch. Sq. T.C. S.E. corner
Stapley	University	1243.74	1243.03	Brass Tag T.C. S.W. corner
Stapley	Brown	1257.20	1256.52	Brass Tag T.C. S.E corner
Stapley	McKellips	1271.60		Brass Tag T.C. S.E. corner
Stapley	McKellips		1271.53	Ch. Sq. T.C. N.E. corner
Gilbert	Baseline	1234.10		Brass Tag T.C. N.E. corner
Gilbert	Baseline		1233.35	Head Wall S.W. corner
Gilbert	Southern	1233.7		Brass Tag T.C. N.E. corner
Gilbert	Southern		1234.78	B.C. irr works N.W. corner
Gilbert	`Broadway	1243.97		Brass Tag T.C. N.E. corner
Gilbert	`Broadway		1243.30	Ch. Sq. T.C. N.W. corner

CITY OF MESA SURVEY BENCHMARKS

N-S X-Street	E-W X-Street	NEW ELEV	OLD ELEV	Description
Gilbert	Main	1249.74		Brass Tag T.C. S.W. corner
Gilbert	Main		1249.56	Ch. Sq. T.C. S.E. corner
Gilbert	University	1256.66	1255.98	Brass Tag T.C. N.E. corner
Gilbert	Brown	1267.92		Brass Tag T.C. S.W. corner
Gilbert	Brown		1267.47	Ch. Sq. T.C. N.W. corner
Gilbert	McKellips	1284.14		Brass Tag T.C. S.E. corner
Gilbert	McKellips		1283.91	Ch. Sq. T.C. S.W. corner
Lindsay	Baseline	1244.66		Brass Tag T.C. N.E. corner
Lindsay	Baseline		1244.3	Ch. Sq. T.C. @end of Curb W. side
Lindsay	Southern	1246.64	1246.15	Brass Tag T.C. N.E. corner
Lindsay	Broadway	1255.60		Brass Tag T.C. S.W. corner
Lindsay	Broadway		1255.38	Ch. Sq. T.C. N.W. corner
Lindsay	Main	1263.11		Brass Tag T.C. S.E. corner
Lindsay	Main		1263.57	Ch. Sq. T.C. W. end Median E. Side
Lindsay	University	1270.18	1269.69	Brass Tag T.C. N.E.corner
Lindsay	Brown	1283.79		Brass Tag T.C. S.W. corner
Lindsay	Brown		1283.34	Ch. Sq. T.C. N.W. corner
Lindsay	McKellips	1302.62	1302.14	Brass Tag T.C. N.E. corner
Lindsay	McDowell	1321.93	1321.25	Brass Tag T.C. S.W. corner
Val Vista	Baseline	1260.82		Brass Tag T.C. N.E. corner
Val Vista	Baseline		1260.40	Ch. Sq. T.C. N.W. corner
Val vista	Southern	1265.73		Brass Tag T.C. N.W. corner
Val vista	Southern		1267.58	Ch. Sq. Irr Box S.W. corner
Val Vista	Broadway	1275.20		Brass Tag S.W. corner
Val Vista	Broadway		1275.12	Ch. Sq. T.C. N.W. corner
Val Vista	Main	1284.22		Brass Tag T.C. S.W. corner
Val Vista	Main		1284.6	Ch. Sq. T.C. Median W. side
Val Vista	University	1292.75	1291.92	Brass Tag T.C. S.W. corner
Val Vista	Brown	1309.59		Brass Tag S.W. corner in head wall
Val Vista	Brown		1314.41	Ch. Sq. Irr works S.W. corner
Val Vista	McKellips	1325.28		Brass Tag T.C. S.W. corner
Val Vista	McKellips		1326.71	Ch. Sq. Irr works S.W. corner

CITY OF MESA SURVEY BENCHMARKS

N-S X-Street	E-W X-Street	NEW ELEV	OLD ELEV	Description
Val Vista	McDowell	1339.21		Brass Tag T.C. S.E. corner
Val Vista	McDowell		1339.8	Ch. Sq. Irr works S.W. corner
Greenfield	Baseline	1273.70		Brass Tag T.C. N.E. corner
Greenfield	Baseline		1275.02	B.C. Irr. box S.W. corner
Greenfield	Southern	1291.71		Brass Tag T.C. N.E. corner
Greenfield	Southern		1291.45	Ch. Sq. Irrigation box S.W. corner
Greenfield	Broadway	1302.62	1302.10	Brass Tag T.C. S.W. corner
Greenfield	Main	1313.20		Brass Tag T.C. N.W. corner
Greenfield	Main		1313.43	Ch. Sq. T.C. Median W. side
Greenfield	University	1321.69		Brass Tag T.C. N.W. corner
Greenfield	University		1322.6	Irrigation box S.W. corner
Greenfield	Brown	1341.49		Brass Tag T.C. N.E. corner
Greenfield	Brown		1340.72	Ch. Sq. T.C. S.W. corner
Greenfield	McKellips	1356.57		Brass Tag T.C. N.W.
Greenfield	McKellips		1357.25	Ch. Sq. T.C. N.E. corner
Greenfield	McDowell	1364.91		Brass Tag T.C. S.W. corner
Greenfield	McDowell		1364.35	Ch. Sq. T.C. N.W. corner
Higley	Baseline	1296.57		Brass Tag T.C. S.W. corner
Higley	Baseline		1297.04	Ch. Sq. Irrigation box S.W. corner
Higley	Southern	1322.01	1321.46	Brass Tag Head wall S.E. corner
Higley	Broadway	1332.60		Brass Tag T.C. N.W. corner
Higley	Broadway		1332.45	Ch. Sq. T.C. N.E. corner
Higley	Main	1347.46		Brass Tag T.C. N.E. corner
Higley	Main		1347.00	Ch. Sq. T.C. N.W. corner
Higley	University	1357.45		Brass Tag T.C. S.E corner
Higley	University		1358.01	Ch. Sq. T.C. N.E. corner
Higley	Brown	1380.80		Brass Tag T.C. N.W. corner
Higley	Brown		1381.23	Ch. Sq. T.C. N.E. corner
Higley	McKellips	1398.98		Brass Tag T.C. S.E. corner
Higley	McKellips		1400.09	Ch. Sq. T.C. N.E. corner
Higley	McDowell	1393.69		Brass Tag T.C. S.W. corner
Higley	McDowell		1393.05	Ch. Sq. T.C. S.E. corner

CITY OF MESA SURVEY BENCHMARKS

N-S X-Street	E-W X-Street	NEW ELEV	OLD ELEV	Description
Higley	Thomas	1380.34		Brass Tag T.C. N.E. corner
Higley	Thomas		1374.02	B.C. N. side @ C.L
Recker	Baseline	1322.01		Brass Tag T.C. N.W. corner
Recker	Baseline		1323.15	Ch. Sq. Irr. Works S.W. corner
Recker	Southern	1347.24		Brass Tag T.C. S.E. corner
Recker	Southern		1345.49	Ch. Sq. T.C. S.W. corner
Recker	Broadway	1362.67		Brass Tag T.C. N.W. corner)
Recker	Broadway		1362.87	Ch. Sq. T.C. N.E. corner
Recker	Main	1381.85		Brass Tag T.C. N.E. corner
Recker	Main		1381.95	Ch. Sq. T.C. W. end Median E. side
Recker	University	1395.54		Brass Tag T.C. S.W. corner
Recker	University		1395.48	Ch. Sq. T.C. S.E. corner
Recker	Brown	1427.85		Brass Tag T.C. S.E. corner
Recker	Brown		1430.16	Ch. Sq. Nail in PP N.E. corner
Recker	McKellips	1455.22		Brass Tag T.C. S.E. corner
Recker	McKellips		1449.59	Ch. Sq. Head wall S. Bridge
Recker	McDowell	1459.72	1459.93	Brass Tag T.C. N.E. corner
Recker	Thomas	1447.02		Brass Tag T.C. S.W. corner
Recker	Thomas		1445.61	Cotton spindle in PP N. side
Power	Williams Field	1329.03		Brass Cap T.C. N.E. corner
Power	Ray	1322.68		Brass Tag T.C. S.E. corner
Power	Ray		1323.04	Ch. Sq. Head wall N.W. corner
Power	Warner	1321.83		Brass tag T.C. N.E. corner
Power	Warner		1322.84	Nail in PP S.E. corner
Power	Elliot	1327.52		Brass Tag in Headwall
Power	Elliot		1327.19	Nail in Power Pole N.E. corner
Power	Guadalupe	1336.86		Brass Tag T.C. N.E. corner
Power	Guadalupe		1337.63	Nail in Power Pole S.W. cor
Power	Baseline	1352.70		Brass Tag T.C. N.W. corner
Power	Baseline		1352.51	Ch. Sq. T.C. S.E. corner
Power	Southern	1376. 59	1376.32	Brass Tag T.C. N.E. corner
Power	Broadway	1394 17	1393.36	Brass Tag T.C. S.W. corner

CITY OF MESA SURVEY BENCHMARKS

N-S X-Street	E-W X-Street	NEW ELEV	OLD ELEV	Description
Power	Main	1414.33	1414.12	Brass Tag T.C. S.W. corner
Power	University	1435.17	1434.8	Brass Tag T.C. S.W. corner
Power	Brown	1477.69	1476.52	Brass Tag T.C. N.E. corner
Power	McKellips	1522.98		Brass Tag T.C. N.E.
Power	McKellips		1523.62	Ch. Sq. T.C. N.W. corner
Power	McDowell	1552.86		Brass Tag T.C. S.W. corner
Power	McDowell		1553.84	B.C. in Hand hole C.L.
Sossaman	Germann	1356.69		Brass Tag N.W. corner in bridge
Sossaman	Elliot	1350.03	1349.75	Brass Tag in head wall
Sossaman	Guadalupe	1358.84		Brass Tag T.C. N.W. corner
Sossaman	Baseline	1388.17	1387.89	Brass Tag T.C. N.E. corner
Sossaman	Southern	1408.46	1408.37	Brass Tag T.C. N.E. corner
Sossaman	Broadway	1428.03	1427.91	Brass Tag T.C. N.E.corner
Sossaman	Main	1448.46	1448.35	Brass Tag T.C. N.E. corner
Sossaman	University	1469.97	1468.76	Brass Tag T.C. S.E.corner (Old T.C. S.W. corner)
Sossaman	Brown	1528.75	1527.69	S. Side T.C., masonry wall alignment
Sossaman	McKellips	1587.72		Brass Tag S. side in light pole base
Sossaman	McKellips		1587.48	3/4" Pipe C.L.
Sossaman	McDowell	1648.87		Brass Tag T.C. N.W. corner
Sossaman	McDowell		1648.45	B.C. in Hand hole C.L.
Hawes	Elliot	1377.37		Brass Tag N.W. corner in Headwall
Hawes	Baseline	1413.71		Brass Tag T.C. S.E. corner
Hawes	Baseline		1422.37	T.C. E. end DW @ Well #10
Hawes	Southern	1443.15	1443.45	Brass Tag T.C. S.W. corner
Hawes	Broadway	1465.83	1465.83	Brass Tag T.C. N.W. corner
Hawes	University	1512.29	1511.88	Brass Tag T.C. S.E. corner
Hawes	Brown	1600.94		Brass Tag T.C. N.E. corner
Hawes	McKellips	1664.15	1663.81	Brass Tag in Head wall S. side McKellips
Hawes	McDowell	1756.59	1756.16	Brass Tag T.C. N.E. corner
Ellsworth	Germann	1396.34		Brass Tag N.E. corner concrete for manhole
Ellsworth	Elliot	1405.76		Brass Tag N.W. corner on concrete pad
Ellsworth	Guadalupe	1424.42		Brass Tag T.C. S.E. corner

The NGS Data Sheet

See file dsdata.txt for more information about the datasheet.

```
DATABASE = Sybase ,PROGRAM = datasheet, VERSION = 7.18
1        National Geodetic Survey,   Retrieval Date = JUNE  1, 2005
 AJ3677 ***********************************************************************
 AJ3677  HT_MOD       -  This is a Height Modernization Survey Station.
 AJ3677  DESIGNATION -  1CM1
 AJ3677  PID          -  AJ3677
 AJ3677  STATE/COUNTY-  AZ/MARICOPA
 AJ3677  USGS QUAD    -  BUCKHORN (1982)
 AJ3677
 AJ3677                          *CURRENT SURVEY CONTROL
 AJ3677
 AJ3677* NAD 83(1992)-  33 27 58.16842(N)    111 40 47.25024(W)      ADJUSTED
 AJ3677* NAVD 88      -       485.32   (meters)    1592.3    (feet)  GPS OBS
 AJ3677
 AJ3677  X            -  -1,967,718.096 (meters)                     COMP
 AJ3677  Y            -  -4,949,738.183 (meters)                     COMP
 AJ3677  Z            -   3,497,455.062 (meters)                     COMP
 AJ3677  LAPLACE CORR-            3.44  (seconds)                    DEFLEC99
 AJ3677  ELLIP HEIGHT-          455.90  (meters)          (04/12/01) GPS OBS
 AJ3677  GEOID HEIGHT-          -29.43  (meters)                     GEOID03
 AJ3677
 AJ3677  HORZ ORDER   -  B
 AJ3677  ELLP ORDER   -  THIRD     CLASS II
 AJ3677
 AJ3677.The horizontal coordinates were established by GPS observations
 AJ3677.and adjusted by the National Geodetic Survey in April 2001.
 AJ3677
 AJ3677.The orthometric height was determined by GPS observations and a
 AJ3677.high-resolution geoid model using precise GPS observation and
 AJ3677.processing techniques.
 AJ3677
 AJ3677.The X, Y, and Z were computed from the position and the ellipsoidal ht.
 AJ3677
 AJ3677.The Laplace correction was computed from DEFLEC99 derived deflections.
 AJ3677
 AJ3677.The ellipsoidal height was determined by GPS observations
 AJ3677.and is referenced to NAD 83.
 AJ3677
 AJ3677.The geoid height was determined by GEOID03.
 AJ3677
 AJ3677;                     North         East     Units Scale Factor Converg.
 AJ3677;SPC AZ C      -   273,472.396   235,377.405   MT  0.99990597   +0 07 50.2
 AJ3677;UTM  12       - 3,703,173.839   436,832.145   MT  0.99964919   -0 22 29.6
 AJ3677
 AJ3677!              -  Elev Factor  x  Scale Factor =   Combined Factor
 AJ3677!SPC AZ C      -   0.99992843  x   0.99990597  =   0.99983441
 AJ3677!UTM  12       -   0.99992843  x   0.99964919  =   0.99957765
 AJ3677
 AJ3677                          SUPERSEDED SURVEY CONTROL
 AJ3677
 AJ3677.No superseded survey control is available for this station.
 AJ3677
 AJ3677_U.S. NATIONAL GRID SPATIAL ADDRESS: 12SVC3683203174(NAD 83)
 AJ3677_MARKER: I = METAL ROD
 AJ3677_SETTING: 59 = STAINLESS STEEL ROD IN SLEEVE (10 FT.+)
 AJ3677_STAMPING: 1CM1 1999
```

```
AJ3677_PROJECTION: FLUSH
AJ3677_MAGNETIC: B = BAR MAGNET IMBEDDED IN MONUMENT
AJ3677_STABILITY: A = MOST RELIABLE AND EXPECTED TO HOLD
AJ3677+STABILITY: POSITION/ELEVATION WELL
AJ3677_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
AJ3677+SATELLITE: SATELLITE OBSERVATIONS - 1999
AJ3677_ROD/PIPE-DEPTH:  5.2 meters
AJ3677_SLEEVE-DEPTH  :  0.8 meters
AJ3677
AJ3677  HISTORY     - Date     Condition        Report By
AJ3677  HISTORY     - 1999     MONUMENTED       MCDOT
AJ3677
AJ3677                          STATION DESCRIPTION
AJ3677
AJ3677'DESCRIBED BY MARICOPA CO DOT 1999 (GF)
AJ3677'THE STATION IS LOCATED WITHIN THE CITY OF MESA, TOWNSHIP 01 NORTH,
AJ3677'RANGE 07 EAST, SECTION 6
AJ3677'OWNERSHIP - MARICOPA COUNTY FLOOD CONTROL
AJ3677'TO REACH THE STATION FROM THE JUNCTION OF US 60 AND POWER ROAD (EXIT
AJ3677'188), DRIVE NORTH ON POWER ROAD 5.5 MI (8.9 KM) TO THE INTERSECTION OF
AJ3677'MCDOWELL ROAD, THENCE TURN RIGHT (EAST) ON MCDOWELL ROAD AND DRIVE 0.2
AJ3677'MI (0.3 KM)(YOU WILL PASS OVER THE CAP CANAL) AND PARK, THENCE WALK
AJ3677'ABOUT 37 FT (11.3 M) SOUTH TO THE STATION AS DESCRIBED
AJ3677'MONUMENT DESCRIPTION - THE STATION IS MARKED BY AN ALUMINUM CAP
AJ3677'COMPRESSED ON A 13.7 FOOT (4.0 M) STAINLESS STEEL ROD DRIVEN TO
AJ3677'REFUSAL ENCASED IN A 1 INCH GREASED PVC SLEEVE ENCLOSED IN A 5 INCH
AJ3677'PVC PIPE WITH AN ACCESS COVER STAMPED 1CM1 1999, SURROUNDED WITH A
AJ3677'CONCRETE COLLAR FLUSH WITH THE GROUND, WITNESSED BY A WHITE CARSONITE
AJ3677'MARKER
AJ3677'STATION TIES
AJ3677'37 FT (11.3 M) SOUTH OF MCDOWELL ROAD CENTERLINE
AJ3677'25 FT (7.6 M) EAST CENTERLINE OF EARTH DAM
AJ3677'12 FT (3.7 M) SOUTH OF FENCE LINE
AJ3677'4.9 FT (1.5 M) FROM WHITE CARSONITE MARKER
AJ3677'FOR A TO REACH MAP, STATION IMAGES AND ADDITIONAL INFORMATION, YOU CAN
AJ3677'VISIT WWW.MCDOT.MARICOPA.GOV       SEARCH KEYWORD  GDACS

*** retrieval complete.
Elapsed Time = 00:00:00
```

Falcon Park 11/11

The NGS Data Sheet

See file dsdata.txt for more information about the datasheet.

```
DATABASE = Sybase ,PROGRAM = datasheet, VERSION = 7.18
1         National Geodetic Survey,   Retrieval Date = JUNE  1, 2005
 DU0654 ***********************************************************************
 DU0654  FBN          -  This is a Federal Base Network Control Station.
 DU0654  DESIGNATION  -  A 365
 DU0654  PID          -  DU0654
 DU0654  STATE/COUNTY-   AZ/MARICOPA
 DU0654  USGS QUAD    -  BUCKHORN (1982)
 DU0654
 DU0654                          *CURRENT SURVEY CONTROL
 DU0654  ______________________________________________________________________
 DU0654* NAD 83(1992)-  33 26 55.04154(N)    111 40 27.33851(W)     ADJUSTED
 DU0654* NAVD 88      -       473.781  (meters)    1554.40   (feet)  ADJUSTED
 DU0654  ______________________________________________________________________
 DU0654  X            -  -1,967,632.745 (meters)                     COMP
 DU0654  Y            -  -4,950,915.664 (meters)                     COMP
 DU0654  Z            -   3,495,825.974 (meters)                     COMP
 DU0654  LAPLACE CORR-            3.21  (seconds)                    DEFLEC99
 DU0654  ELLIP HEIGHT-          444.35  (meters)          (09/30/99) GPS OBS
 DU0654  GEOID HEIGHT-          -29.45  (meters)                     GEOID03
 DU0654  DYNAMIC HT   -         473.215 (meters)    1552.54   (feet) COMP
 DU0654  MODELED GRAV-      979,428.4   (mgal)                       NAVD 88
 DU0654  OBS GRAVITY  -     979,430.7   (mgal)                       GRAV_OBS
 DU0654
 DU0654  HORZ ORDER   -  A
 DU0654  VERT ORDER   -  FIRST     CLASS I
 DU0654  ELLP ORDER   -  THIRD     CLASS I
 DU0654
 DU0654.The horizontal coordinates were established by GPS observations
 DU0654.and adjusted by the National Geodetic Survey in September 1992.
 DU0654
 DU0654.The orthometric height was determined by differential leveling
 DU0654.and adjusted by the National Geodetic Survey in June 1991.
 DU0654
 DU0654.Photographs are available for this station.
 DU0654
 DU0654.The X, Y, and Z were computed from the position and the ellipsoidal ht.
 DU0654
 DU0654.The Laplace correction was computed from DEFLEC99 derived deflections.
 DU0654
 DU0654.The ellipsoidal height was determined by GPS observations
 DU0654.and is referenced to NAD 83.
 DU0654
 DU0654.The geoid height was determined by GEOID03.
 DU0654
 DU0654.The dynamic height is computed by dividing the NAVD 88
 DU0654.geopotential number by the normal gravity value computed on the
 DU0654.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
 DU0654.degrees latitude (g = 980.6199 gals.).
 DU0654
 DU0654.The modeled gravity was interpolated from observed gravity values.
 DU0654.The observed gravity was obtained from relative gravimeter ties
 DU0654.to the IGSN71 gravity network.
 DU0654
 DU0654;                    North         East     Units Scale Factor Converg.
 DU0654;SPC AZ C      -  271,528.889   235,896.050   MT  0.99990626   +0 08 01.0
```

```
DU0654;UTM  12       - 3,701,226.334   437,333.498   MT  0.99964841   -0 22 18.0
DU0654
DU0654!              -  Elev Factor  x  Scale Factor =   Combined Factor
DU0654!SPC AZ C      -   0.99993024  x   0.99990626  =   0.99983651
DU0654!UTM  12       -   0.99993024  x   0.99964841  =   0.99957868
DU0654
DU0654                          SUPERSEDED SURVEY CONTROL
DU0654
DU0654  NAD 83(1986)-  33 26 55.03352(N)    111 40 27.34301(W) AD(       ) B
DU0654  ELLIP H (09/04/92)  444.40   (m)                       GP(       ) 3 1
DU0654  NAD 83(1986)-  33 26 55.03352(N)    111 40 27.34301(W) AD(       ) 1
DU0654  NAVD 88 (08/15/94)  473.78   (m)         1554.4    (f) LEVELING    3
DU0654  NAVD 88 (09/04/92)  473.78   (m)         1554.4    (f) LEVELING    3
DU0654  NGVD 29 (??/??/92)  473.195  (m)         1552.47   (f) ADJ UNCH    1 1
DU0654
DU0654.Superseded values are not recommended for survey control.
DU0654.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
DU0654.See file dsdata.txt to determine how the superseded data were derived.
DU0654
DU0654_U.S. NATIONAL GRID SPATIAL ADDRESS: 12SVC3733301226(NAD 83)
DU0654_MARKER: DB = BENCH MARK DISK
DU0654_SETTING: 66 = SET IN ROCK OUTCROP
DU0654_SP_SET: IN DRILL HOLE IN ROCK OUTCROP
DU0654_STAMPING: A 365 1967
DU0654_MARK LOGO: CGS
DU0654_MAGNETIC: O = OTHER; SEE DESCRIPTION
DU0654_STABILITY: A = MOST RELIABLE AND EXPECTED TO HOLD
DU0654+STABILITY: POSITION/ELEVATION WELL
DU0654_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
DU0654+SATELLITE: SATELLITE OBSERVATIONS - March 29, 2000
DU0654
DU0654  HISTORY     - Date     Condition        Report By
DU0654  HISTORY     - 1967     MONUMENTED       CGS
DU0654  HISTORY     - 1975     GOOD             NGS
DU0654  HISTORY     - 1981     GOOD             NGS
DU0654  HISTORY     - 19840323 GOOD
DU0654  HISTORY     - 1986     GOOD             AZDT
DU0654  HISTORY     - 1987     GOOD             NGS
DU0654  HISTORY     - 19920120 GOOD             NGS
DU0654  HISTORY     - 19920204 GOOD             NGS
DU0654  HISTORY     - 19940203 GOOD             NGS
DU0654  HISTORY     - 19940203 GOOD             NOS
DU0654  HISTORY     - 19940216 GOOD             NOS
DU0654  HISTORY     - 19960304 GOOD             CHANCE
DU0654  HISTORY     - 19980916 POOR             AZ-013
DU0654  HISTORY     - 19981102 GOOD             NGS
DU0654  HISTORY     - 20000329 GOOD             MCDOT
DU0654
DU0654                          STATION DESCRIPTION
DU0654
DU0654'DESCRIBED BY COAST AND GEODETIC SURVEY 1967
DU0654'4.3 MI NE FROM BUCKHORN.
DU0654'ABOUT 1.0 MILE EAST ALONG U.S. HIGHWAYS 60, 70, 80 AND 89 FROM THE
DU0654'POST OFFICE AT BUCKHORN, THENCE 2.5 MILES NORTH ALONG BUSH HIGHWAY,
DU0654'THENCE 0.8 MILE SOUTHEAST ALONG A TRAIL ROAD, IN S 7, T 1 N, R 7 E, AT
DU0654'THE FOOT OF THE WEST SLOPE OF THE HIGHEST HILL IN THE VICINITY, 53
DU0654'FEET SOUTHEAST OF THE CENTER LINE OF THE TRAIL ROAD AROUND THE HILL,
DU0654'SET IN THE TOP OF A ROCK OUTCROP, 0.7 FOOT NORTH OF A METAL WITNESS
DU0654'POST, AND ABOUT 5 FEET ABOVE THE LEVEL OF THE TRAIL ROAD.
DU0654
DU0654                          STATION RECOVERY (1975)
DU0654
DU0654'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1975
```

```
DU0654'ABOUT 8.7 MILES EAST ALONG U.S. HIGHWAY 60, 70, 80 AND 89 FROM
DU0654'DOWNTOWN MESA TO BUSH HIGHWAY, THENCE 2.5 MILES NORTH ALONG BUSH
DU0654'HIGHWAY, THENCE 0.8 MILE SOUTHEAST ALONG A TRAIL ROAD TO THE FOOT OF
DU0654'THE WEST SLOPE OF THE HIGHEST HILL IN THE VICINITY, 53 FEET SOUTHEAST
DU0654'OF THE CENTERLINE OF THE TRAIL ROAD AROUND THE HILL, SET IN THE TOP OF
DU0654'A ROCK OUTCROP, 0.7 FOOT NORTH OF A METAL WITNESS POST, AND ABOUT 5
DU0654'FEET ABOVE THE LEVEL OF THE TRAIL ROAD.  1/4, SEC 7, T 1N, R 7E.
DU0654
DU0654                          STATION RECOVERY (1981)
DU0654
DU0654'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1981
DU0654'RECOVERED IN GOOD CONDITION.
DU0654
DU0654                          STATION RECOVERY (1984)
DU0654
DU0654'RECOVERED 1984
DU0654'RECOVERED IN GOOD CONDITION.
DU0654
DU0654                          STATION RECOVERY (1986)
DU0654
DU0654'RECOVERY NOTE BY ARIZONA DEPARTMENT OF TRANSPORTATION 1986 (JRT)
DU0654'THE STATION WAS RECOVERED AT THIS DATE.
DU0654'THE STATION WAS FOUND IN GOOD CONDITION.  PREVIOUS TO REACH
DU0654'DESCRIPTION WAS ADEQUATE.
DU0654
DU0654                          STATION RECOVERY (1987)
DU0654
DU0654'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1987 (MRM)
DU0654'THE STATION WAS RECOVERED AT THIS DATE.
DU0654'
DU0654'THE STATION IS LOCATED ABOUT 7.2 KM (4.5 MI)
DU0654'EAST-SOUTHEAST OF SIGNAL BUTTE,
DU0654'7.2 KM (4.5 MI) NORTH OF SR 360 (SUPERSTITION FREEWAY) AND AT THE
DU0654'BOTTOM OF THE WEST END OF A SMALL HILL.
DU0654'OWNERSHIP--UNKNOWN.
DU0654'
DU0654'TO REACH THE STATION FROM THE JUNCTION OF STATE ROUTE 360
DU0654'(SUPERSTITION FREEWAY) AND POWERS ROAD IN MESA, GO
DU0654'NORTH FOR 3.2 KM (2.0 MI) ON POWERS ROAD TO APACHE TRAIL.
DU0654'CONTINUE STRAIGHT AHEAD AND GO NORTH FOR 4.0 KM (2.5 MI) ON BUSH
DU0654'HIGHWAY TO MCKELLIPS ROAD.
DU0654'TURN RIGHT AND GO EAST FOR 0.8 KM (0.5 MI) ON MCKELLIPS ROAD TO A
DU0654'DIRT ROAD ON THE RIGHT, AT THE END OF A BLOCK WALL.
DU0654'TURN RIGHT AND GO SOUTHEAST FOR 0.3 KM (0.2 MI) ON THE DIRT ROAD TO
DU0654'A DIRT ROAD LEFT.
DU0654'CONTINUE STRAIGHT AHEAD AND GO SOUTHEAST FOR
DU0654'0.1 KM (0.05 MI) ON THE DIRT ROAD TO THE WEST BASE OF A SMALL HILL
DU0654'AND THE STATION, BETWEEN TWO LARGE PALOVERDE TREES.
DU0654'
DU0654'THE STATION IS A STANDARD CGS BENCH MARK DISK
DU0654'STAMPED---A 365 1965---,
DU0654'SET INTO A DRILL HOLE IN THE TOP OF ROCK OUTCROP OF 0.5 METERS
DU0654'LARGEST DIMENSION.  LOCATED
DU0654'15.2 METERS (50.0 FT) SOUTHEAST FROM THE APPROXIMATE CENTER OF THE
DU0654'TRAIL ROAD AROUND THE HILL,
DU0654'9.7 METERS (31.8 FT) NORTHEAST FROM A PALOVERDE TREE AND
DU0654'8.3 METERS (27.2 FT) SOUTH FROM A PALOVERDE TREE.
DU0654'
DU0654'CALIFORNIA FAA AIRPORTS, 1987.
DU0654'
DU0654'THIS STATION SUITABLE FOR GPS SURVEYS.
DU0654'
DU0654'DESCRIBED BY S.E. RANDALL.
```

DU0654
DU0654 STATION RECOVERY (1992)
DU0654
DU0654'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1992
DU0654'14.5 KM (9.00 MI) EASTERLY ALONG U.S. HIGHWAY 60 (MAIN STREET) FROM
DU0654'THE JUNCTION OF STATE HIGHWAY 87 (COUNTRY CLUB DRIVE) IN MESA, THENCE
DU0654'4.0 KM (2.50 MI) NORTHERLY ALONG NORTH POWERS ROAD, THENCE 0.9 KM
DU0654'(0.55 MI) EASTERLY ALONG EAST MCKELLIPS ROAD, THENCE 0.3 KM (0.20 MI)
DU0654'SOUTHERLY ACROSS COUNTRY, NEAR THE CENTER OF A 1 BY 2-FOOT AREA OF
DU0654'OUTCROPPING BEDROCK ALONG THE WEST SLOPE OF A HILL, 5.0 M (16.4 FT)
DU0654'EAST OF THE BASE OF THE HILL, AND 1.0 M (3.3 FT) SOUTH OF A WITNESS
DU0654'POST.
DU0654
DU0654 STATION RECOVERY (1992)
DU0654
DU0654'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1992
DU0654'THE STATION IS LOCATED ABOUT 12 KM (7.5 MI) NORTHEAST OF MESA, 4 KM
DU0654'(2.5 MI) EAST-SOUTHEAST OF FALCON FIELD, 0.3 KM (0.2 MI) SOUTH OF
DU0654'MCKELLIPS ROAD, JUST NORTHWEST OF THE FALCON HILL ELEMENTARY SCHOOL,
DU0654'ON THE WEST END OF A LOW RIDGE AND AT THE TOE OF THE HILL.
DU0654'OWNERSHIP--UNKNOWN.
DU0654'TO REACH THE STATION FROM THE JUNCTION OF STATE HIGHWAY 360 AND POWER
DU0654'ROAD (EXIT 16) ABOUT 14.4 KM (8.9 MI) EAST OF THE JUNCTION OF STATE
DU0654'HIGHWAYS 87 AND 360 IN MESA, GO NORTH ON POWER ROAD FOR 3.29 KM
DU0654'(2.04 MI) TO ITS JUNCTION WITH U.S. HIGHWAY 60 (MAIN STREET).
DU0654'CONTINUE NORTH ON POWER ROAD FOR 3.98 KM (2.47 MI) TO A CROSSROAD.
DU0654'TURN RIGHT, EAST ON MCKELLIPS ROAD FOR 0.98 KM (0.61 MI) TO A DIM
DU0654'ROAD RIGHT, JUST BEFORE REACHING A CANAL CROSSING. TURN RIGHT,
DU0654'SOUTH, CROSSING A SLIGHT HUMP, THEN TURN RIGHT, SOUTHWEST ON A DIRT
DU0654'ROAD ACROSS AN OPEN AREA FOR 0.28 KM (0.17 MI) TO TREES ON THE LEFT.
DU0654'TURN LEFT ACROSS THE FIELD FOR 0.08 KM (0.05 MI) TO A ROW OF BOULDERS
DU0654'BETWEEN TWO TREES AND THE STATION 15 M (49.2 FT) BEYOND.
DU0654'THE STATION IS SET IN A DRILL HOLE IN A 0.3 M (1.0 FT) X 0.5 M
DU0654'(1.6 FT) X 0.1 M (0.3 FT) HIGH OUTCROP BETWEEN TWO PALO VERDE TREES
DU0654'AND 1.0 M (3.3 FT) ABOVE THE SURROUNDING TERRAIN. LOCATED 55.0 M
DU0654'(180.4 FT) WEST AROUND BASE OF RIDGE FROM THE NORTHWEST FENCE CORNER
DU0654'OF SCHOOL PLAYGROUND, 10.0 M (32.8 FT) NORTHEAST OF A PARTIALLY DEAD
DU0654'PALO VERDE TREE AND 8.5 M (27.9 FT) SOUTH OF A PALO VERDE TREE.
DU0654
DU0654 STATION RECOVERY (1994)
DU0654
DU0654'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1994 (JDR)
DU0654'RECOVERED AS DESCRIBED. NOTE-CONTINUE NORTH ON POWER ROAD PAST MAIN
DU0654'STREET FOR 2.3 MI (3.7 KM) TO JENSEN ROAD. TURN RIGHT HEADING EAST FOR
DU0654'0.55 MI (0.89 KM) TO A FIELD ON THE LEFT. THERE IS A DIRT ROAD LEADING
DU0654'TO A HILL OF ROCK OUTCROPS. STATION IS ABOUT 600 FT (182.9 M) FROM
DU0654'ROAD AND IS BETWEEN TWO TREES.
DU0654
DU0654 STATION RECOVERY (1994)
DU0654
DU0654'RECOVERY NOTE BY NATIONAL OCEAN SERVICE 1994 (JDR)
DU0654'RECOVERED AS DESCRIBED. NOTE-CONTINUE NORTH ON POWER ROAD PAST MAIN
DU0654'STREET FOR 2.3 MI (3.7 KM) TO JENSEN ROAD. TURN RIGHT HEADING EAST FOR
DU0654'0.55 MI (0.89 KM) TO A FIELD ON THE LEFT. THERE IS A DIRT ROAD LEADING
DU0654'TO A HILL OF ROCK OUTCROPS. STATION IS ABOUT 600 FT (182.9 M) FROM
DU0654'ROAD AND IS BETWEEN TWO TREES.
DU0654
DU0654 STATION RECOVERY (1994)
DU0654
DU0654'RECOVERY NOTE BY NATIONAL OCEAN SERVICE 1994 (RAH)
DU0654'THE STATION IS LOCATED ABOUT 7.5 MI (12.1 KM) NORTHEAST OF MESA, 2.5
DU0654'MI (4.0 KM) EAST SOUTHEAST OF FALCON FIELD AND 0.2 MI (0.3 KM) SOUTH
DU0654'OF MCKELLIPS ROAD, JUST NORTHWEST OF FALCON HILL ELEMENTARY SCHOOL ON

DU0654'THE WEST END OF A LOW RIDGE AND THE TOE OF A HILL. TO REACH THE
DU0654'STATION FROM THE JUNCTION OF U.S. HIGHWAY 60, STATE HIGHWAY 360 AND
DU0654'POWER ROAD, GO NORTH ON POWER ROAD FOR 4.3 MI (6.9 KM) TO JENSEN ROAD.
DU0654'TURN RIGHT ON JENSEN ROAD FOR 0.5 MI (0.8 KM) EAST TO A TRACK ROAD
DU0654'JUST PAST A BLOCK WALL AROUND A HOUSING DEVELOPMENT, AND RUNNING
DU0654'NORTHEAST FROM A LOW GRASSY AREA ON THE LEFT. FOLLOW TRACK ROAD
DU0654'NORTHEAST TO WEST TOE OF A HILL AND STATION ON THE RIGHT BETWEEN TWO
DU0654'PALO VERDE TREES. DESCRIBED AND RECOVERED BY RALPH A. HARRELL, CHIEF
DU0654'OF NOS PARTY.
DU0654
DU0654 STATION RECOVERY (1996)
DU0654
DU0654'RECOVERY NOTE BY JE CHANCE AND ASSOCIATES 1996 (KHB)
DU0654'RECOVERED AS DESCRIBED. UPDATES TO THE DESCRIPTION FOLLOW TO REACH
DU0654'THE STATION FROM THE JUNCTION OF US HIGHWAY 60 (MAIN STREET) AND STATE
DU0654'HIGHWAY 87 (COUNTRY CLUB DRIVE) IN MESA, GO EAST ON US HIGHWAY 60 FOR
DU0654'14.4 KM (8.95 MI) TO POWER ROAD (EXIT 189 ON US HIGHWAY 60) . PROCEED
DU0654'NORTH ON POWER ROAD FOR 4.0 KM (2.50 MI) PAST MAIN STREET TO JENSEN
DU0654'ROAD. TURN RIGHT ON AND GO EAST ON JENSEN ROAD FOR 0.88 KM (0.55 MI)
DU0654'TO A SMALL PARK ON THE NORTH SIDE OF THE ROAD AND THE STATION
DU0654'APPROXIMATELY 182.9 M (600.1 FT) FROM THE ROAD, ON THE SOUTH SIDE OF A
DU0654'ROCK HILL THE STATION IS LOCATED 26.1 M (85.6 FT) SOUTH-SOUTHWEST FROM
DU0654'A PARK SIGN
DU0654
DU0654 STATION RECOVERY (1998)
DU0654
DU0654'RECOVERY NOTE BY MARICOPA COUNTY ARIZONA 1998 (LOC)
DU0654'RECOVERED AS DESCRIBED.
DU0654
DU0654 STATION RECOVERY (1998)
DU0654
DU0654'RECOVERY NOTE BY NATIONAL GEODETIC SURVEY 1998 (CSM)
DU0654'THE STATION IS LOCATED IN THE EAST SECTION OF MESA, AT THE CITY OF
DU0654'MESA, FALCON HILL PARK LOCATED ON JENSEN STREET, 0.96 KM (0.60 MI)
DU0654'EAST OF ITS JUNCTION WITH POWER ROAD, IN ROCK OUTCROP AT THE WEST BASE
DU0654'OF A HILL ON THE EAST SIDE OF THE PARK. OWNERSHIP--CITY OF MESA. TO
DU0654'REACH THE STATION FROM THE EXIT RAMP AT THE JUNCTION OF U.S. STATE
DU0654'HIGHWAY 60 (EXIT 188) AND POWER ROAD IN MESA, GO NORTH ON POWER ROAD
DU0654'FOR 6.96 KM (4.30 MI) TO THE JUNCTION OF JENSEN STREET ON THE RIGHT,
DU0654'TURN RIGHT, EAST ON JENSEN STREET AND GO 0.96 KM (0.60 MI) TO THE EAST
DU0654'SIDE OF FALCON HILL PARK ON THE LEFT AND A HOUSE NUMBERED 7231 ON THE
DU0654'RIGHT. TURN LEFT, NORTH ON A NARROW TRAIL ROAD BETWEEN THE LANDSCAPED
DU0654'AREA AROUND THE PARK AND GO 0.08 KM (0.05 MI) TO THE STATION ON THE
DU0654'RIGHT. THE STATION IS A US COAST AND GEODETIC SURVEY BENCH MARK DISK
DU0654'SET IN A DRILL HOLE IN A 0.55 M (1.80 FT) BY 0.40 M (1.31 FT) ROCK
DU0654'OUTCROP AT THE BASE OF THE HILL, DIRECTLY EAST AND ACROSS THE GRASSY
DU0654'AREA OF THE PARK FROM A VOLLEYBALL NET IN THE CENTER OF THE PARK. IT
DU0654'IS 42.05 M (137.96 FT) NORTH-NORTHEAST OF LIGHT POLE NUMBER 24, 29.6 M
DU0654'(97.1 FT) SOUTH-SOUTHEAST OF LIGHT POLE NUMBER 29, 26.7 M (87.6 FT)
DU0654'SOUTH OF THE SOUTH LEG OF A PARK RULES AND REGULATION SIGN, 17.83 M
DU0654'(58.50 FT) EAST-SOUTHEAST OF LIGHT POLE NUMBER 28, 10.21 M (33.50 FT)
DU0654'EAST-SOUTHEAST OF THE EAST CONCRETE CURBING AROUND THE PARK AND 10.05
DU0654'M (32.97 FT) NORTHEAST OF A SMALL 6-FT TALL SAGUARO CACTUS.
DU0654
DU0654 STATION RECOVERY (2000)
DU0654
DU0654'RECOVERY NOTE BY MARICOPA CO DOT 2000 (KRH)
DU0654'RECOVERED AS DESCRIBED.

*** retrieval complete.
Elapsed Time = 00:00:01

SKP BCC

The NGS Data Sheet

See file dsdata.txt for more information about the datasheet.

```
DATABASE = Sybase ,PROGRAM = datasheet, VERSION = 7.18
1         National Geodetic Survey,   Retrieval Date = JUNE  1, 2005
 AI1922 ***********************************************************************
 AI1922  DESIGNATION -  EVSC
 AI1922  PID         -  AI1922
 AI1922  STATE/COUNTY-  AZ/MARICOPA
 AI1922  USGS QUAD   -  BUCKHORN (1982)
 AI1922
 AI1922                          *CURRENT SURVEY CONTROL
 AI1922  ___________________________________________________________________
 AI1922* NAD 83(1992)-  33 25 27.90541(N)    111 40 52.36683(W)     ADJUSTED
 AI1922* NAVD 88     -       441.8    (meters)    1449.     (feet)  GPS OBS
 AI1922  ___________________________________________________________________
 AI1922  X           -  -1,968,770.135 (meters)                     COMP
 AI1922  Y           -  -4,952,026.720 (meters)                     COMP
 AI1922  Z           -   3,493,567.912 (meters)                     COMP
 AI1922  LAPLACE CORR-            2.91  (seconds)                   DEFLEC99
 AI1922  ELLIP HEIGHT-          412.33  (meters)          (09/30/99) GPS OBS
 AI1922  GEOID HEIGHT-          -29.52  (meters)                     GEOID03
 AI1922
 AI1922  HORZ ORDER  -  A
 AI1922  ELLP ORDER  -  THIRD     CLASS I
 AI1922
 AI1922.The horizontal coordinates were established by GPS observations
 AI1922.and adjusted by the National Geodetic Survey in September 1999.
 AI1922
 AI1922.The orthometric height was determined by GPS observations and a
 AI1922.high-resolution geoid model.
 AI1922
 AI1922.Photographs are available for this station.
 AI1922
 AI1922.The X, Y, and Z were computed from the position and the ellipsoidal ht.
 AI1922
 AI1922.The Laplace correction was computed from DEFLEC99 derived deflections.
 AI1922
 AI1922.The ellipsoidal height was determined by GPS observations
 AI1922.and is referenced to NAD 83.
 AI1922
 AI1922.The geoid height was determined by GEOID03.
 AI1922
 AI1922;                     North         East     Units Scale Factor Converg.
 AI1922;SPC AZ C     -   268,843.090   235,255.782   MT  0.99990591   +0 07 46.9
 AI1922;UTM  12      - 3,698,546.973   436,669.749   MT  0.99964945   -0 22 30.9
 AI1922
 AI1922!             -  Elev Factor  x  Scale Factor =   Combined Factor
 AI1922!SPC AZ C     -   0.99993527  x   0.99990591  =   0.99984119
 AI1922!UTM  12      -   0.99993527  x   0.99964945  =   0.99958474
 AI1922
 AI1922                          SUPERSEDED SURVEY CONTROL
 AI1922
 AI1922.No superseded survey control is available for this station.
 AI1922
 AI1922_U.S. NATIONAL GRID SPATIAL ADDRESS: 12SVB3667098547(NAD 83)
 AI1922_MARKER: DD = SURVEY DISK
 AI1922_SETTING: 30 = SET IN A LIGHT STRUCTURE
 AI1922_SP_SET: CONCRETE PAD
```

```
AI1922_STAMPING: EVSC 1999
AI1922_MARK LOGO: SRP
AI1922_MAGNETIC: N = NO MAGNETIC MATERIAL
AI1922_STABILITY: D = MARK OF QUESTIONABLE OR UNKNOWN STABILITY
AI1922_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
AI1922+SATELLITE: SATELLITE OBSERVATIONS - 1999
AI1922
AI1922  HISTORY     - Date     Condition        Report By
AI1922  HISTORY     - 1999     MONUMENTED       SRP
AI1922
AI1922                          STATION DESCRIPTION
AI1922
AI1922'DESCRIBED BY SALT RIVER PROJECT 1999 (AB)
AI1922'THE STATION IS LOCATED IN MESA, AT THE SALT RIVER PROJECT EAST VALLEY
AI1922'SERVICE CENTER.  OWNERSHIP--SALT RIVER PROJECT.  CONTACT IS ADRIAN
AI1922'BURCHAM, LAND/SURVEYS DIVISION, PO BOX 52025, MAIL STATION SUR225,
AI1922'TEMPE AZ 85282, PHONE 602-236-3174.  NOTE--SERVICE CENTER COMPLEX IS
AI1922'SECURED AND REQUIRES ACCESS THROUGH SECURITY GUARD GATE.  TO REACH THE
AI1922'STATION FROM THE INTERSECTION OF U.S. HIGHWAY 60 AND POWER ROAD IN
AI1922'MESA, GO NORTH FOR 2.5 MI (4.0 KM) ON POWER ROAD TO UNIVERSITY DR.
AI1922'TURN RIGHT AND GO EAST FOR 0.4 MI (0.6 KM) ON UNIVERSITY DR TO THE SRP
AI1922'EAST VALLEY SERVICE CENTER ON THE LEFT.  ENTER COMPLEX AT SECURITY
AI1922'GUARD SHACK, TURN LEFT AND GO WEST TO THE SOUTHEAST CORNER OF A LARGE
AI1922'CONCRETE PAD AND THE STATION.  THE STATION IS AN ALUMINUM DISK SET IN
AI1922'THE SOUTHEAST CORNER OF THE CONCRETE PAD.  LOCATED 257.6 FT (78.5 M)
AI1922'WEST FROM THE WATER TANK, 198.5 FT (60.5 M) SOUTHWEST FROM THE VEHICLE
AI1922'REPAIR SHOP, 183.7 FT (56.0 M) NORTH FROM A BLOCK WALL AND 342 FT
AI1922'(104.2 M) NORTHEAST FROM THE NORTHEAST CORNER OF A HELICOPTER LANDING
AI1922'PAD.

*** retrieval complete.
Elapsed Time = 00:00:00
```

DU 1372 Power/McDowell BRC

The NGS Data Sheet

See file dsdata.txt for more information about the datasheet.

```
DATABASE = Sybase ,PROGRAM = datasheet, VERSION = 7.18
1         National Geodetic Survey,   Retrieval Date = JUNE  1, 2005
 DU1372 ***********************************************************************
 DU1372  DESIGNATION -  T1N R6E SEC 1 NE COR
 DU1372  PID         -  DU1372
 DU1372  STATE/COUNTY-  AZ/MARICOPA
 DU1372  USGS QUAD   -  BUCKHORN (1982)
 DU1372
 DU1372                          *CURRENT SURVEY CONTROL
 DU1372  ______________________________________________________________________
 DU1372* NAD 83(1986)-  33 27 58.     (N)    111 41 02.     (W)     SCALED
 DU1372* NAVD 88     -       473.72  (+/-2cm)    1554.2    (feet)  VERTCON
 DU1372  ______________________________________________________________________
 DU1372  GEOID HEIGHT-          -29.44  (meters)                   GEOID03
 DU1372
 DU1372  VERT ORDER  -  FIRST     CLASS I (See Below)
 DU1372
 DU1372.The horizontal coordinates were scaled from a topographic map and have
 DU1372.an estimated accuracy of +/- 6 seconds.
 DU1372
 DU1372.The NAVD 88 height was computed by applying the VERTCON shift value to
 DU1372.the NGVD 29 height (displayed under SUPERSEDED SURVEY CONTROL.)
 DU1372.The vertical order pertains to the NGVD 29 superseded value.
 DU1372
 DU1372.The geoid height was determined by GEOID03.
 DU1372
 DU1372;                    North         East    Units  Estimated Accuracy
 DU1372;SPC AZ C     -   273,470.      235,000.      MT  (+/- 180 meters Scaled)
 DU1372
 DU1372                          SUPERSEDED SURVEY CONTROL
 DU1372
 DU1372  NGVD 29 (??/??/92)  473.149  (m)         1552.32   (f) ADJ UNCH    1 1
 DU1372
 DU1372.Superseded values are not recommended for survey control.
 DU1372.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
 DU1372.See file dsdata.txt to determine how the superseded data were derived.
 DU1372
 DU1372_U.S. NATIONAL GRID SPATIAL ADDRESS: 12SVC364031(NAD 83)
 DU1372_MARKER: DD = SURVEY DISK
 DU1372_SETTING: 30 = SET IN A LIGHT STRUCTURE
 DU1372_SP_SET: SURVEY WELL
 DU1372_STABILITY: D = MARK OF QUESTIONABLE OR UNKNOWN STABILITY
 DU1372
 DU1372  HISTORY     - Date     Condition        Report By
 DU1372  HISTORY     - UNK      MONUMENTED       AZ-013
 DU1372  HISTORY     - 1975     GOOD             NGS
 DU1372
 DU1372                          STATION DESCRIPTION
 DU1372
 DU1372'DESCRIBED BY NATIONAL GEODETIC SURVEY 1975
 DU1372'12.2 MI NE FROM MESA.
 DU1372'ABOUT 8.7 MILES EAST ALONG U.S. HIGHWAY 60, 70, 80 AND 89 FROM
 DU1372'DOWNTOWN MESA TO BUSH HIGHWAY, THENCE 3.5 MILES NORTH ALONG BUSH
 DU1372'HIGHWAY TO MCDOWELL RD.  STATION IS A 4 INCH MARICOPA COUNTY BRASS CAP
 DU1372'SET IN A SURVEY WELL DOWN 0.5 FEET ON THE CENTERLINE OF MCDOWELL RD.
 DU1372'AND 2 FEET EAST OF THE APPARENT CENTERLINE OF BUSH HIGHWAY. SECTION 1,
```

DU1372'T 1N, R 6E.

*** retrieval complete.
Elapsed Time = 00:00:00

ERM (study)

The information here on was gathered during studies contracted by the Flood Control District of Maricopa County (FCDMC) and is deemed reliable but is not guaranteed and should always be verified by the user. It is entirely the responsibility of any other user to determine its suitability and errors and/or omissions before using it for themselves and/or for another purpose.

Unofficial Document

ID:	ERM1001
NAD83 Northing (Int Feet):	894510.04
NAD83 Easting (Int Feet):	776080.436
NGVD29 Elev. (Int feet):	1617.241
NAVD88 Elev. (Int feet):	1619.147
Horizontal Order:	First-Order (FGCC 1984) relative accuracy of 1 part in 100,000
Vertical Order:	Third-Order, Class II (FGCC 1984) relative accuracy of 2.0mm x square root of distance in kilometers between points
Date Entered:	1999-12-21
Description:	1" Iron Pipe in pavement @ intersection of Hermosa Vista Drive and 76th Street.

Flood Control District of Maricopa County

Close

#15

ERM (study)

The information here on was gathered during studies contracted by the Flood Control District of Maricopa County (FCDMC) and is deemed reliable but is not guaranteed and should always be verified by the user. It is entirely the responsibility of any other user to determine its suitability and errors and/or omissions before using it for themselves and/or for another purpose.

Unofficial Document

ID:	ERM1057
NAD83 Northing (Int Feet):	897265.825
NAD83 Easting (Int Feet):	773445.321
NGVD29 Elev. (Int feet):	1597.809
NAVD88 Elev. (Int feet):	1599.705
Horizontal Order:	First-Order (FGCC 1984) relative accuracy of 1 part in 100,000
Vertical Order:	Third-Order, Class II (FGCC 1984) relative accuracy of 2.0mm x square root of distance in kilometers between points
Date Entered:	1999-12-21
Description:	Brass Cap flush w/pavement in center of McDowell Road, +/-+ mile east of Power Road.

Flood Control District of Maricopa County

Close

ERM (study)

The information here on was gathered during studies contracted by the Flood Control District of Maricopa County (FCDMC) and is deemed reliable but is not guaranteed and should always be verified by the user. It is entirely the responsibility of any other user to determine its suitability and errors and/or omissions before using it for themselves and/or for another purpose.

Unofficial Document

ID:	ERM1053
NAD83 Northing (Int Feet):	897256.789
NAD83 Easting (Int Feet):	776083.837
NGVD29 Elev. (Int feet):	1647.713
NAVD88 Elev. (Int feet):	1649.629
Horizontal Order:	First-Order (FGCC 1984) relative accuracy of 1 part in 100,000
Vertical Order:	Third-Order, Class II (FGCC 1984) relative accuracy of 2.0mm x square root of distance in kilometers between points
Date Entered:	1999-12-21
Description:	Brass Cap in Handhole @ intersection of McDowell Road and 76th Street.

Flood Control District of Maricopa County

Close

Engineer's Opinion of Probable Cost

Kimley-Horn and Associates, Inc.

ITEM NO.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	AMOUNT
105 - 1	Partnering Allowance	LS	1	$ 20,000.00	$ 20,000.00
107 - 1	AZDES/SWPPP Permits	LS	1	$ 15,000.00	$ 15,000.00
107 - 2	Public Information and Notification Allowance	LS	1	$ 30,000.00	$ 30,000.00
107 - 3	Project Signs Allowance	LS	1	$ 5,000.00	$ 5,000.00
107 - 4	Water Management	LS	1	$ 15,000.00	$ 15,000.00
202 - 1	Mobilization	LS	1	$ 150,000.00	$ 150,000.00
215 - 1	Drainage Excavation	CY	16350	$ 15.00	$ 245,250.00
220 - 1	Riprap Construction Type I	SY	411	$ 80.00	$ 32,880.00
220 - 2	Riprap Construction Type II	SY	48	$ 85.00	$ 4,080.00
220 - 3	Riprap Construction Type III	SY	73	$ 90.00	$ 6,570.00
322 - 1	Permanent Pavement Overlay (Structural Section 2)	SY	364	$ 28.00	$ 10,192.00
336 - 1	Permanent Pavement Replacement (Structural Section 1) (COM M19.4 and MAG 200 Type B, T Top)	SY	2221	$ 28.00	$ 62,188.00
336 - 2	NOT USED				
336 - 3	Resurface Driveway wih 4 inches of AB	SY	1631	$ 25.00	$ 40,775.00
340 - 1	Concrete Curb, Single Curb, MAG Std Dtl 222, Type A	LF	28	$ 15.00	$ 420.00
340 - 2	Concrete Curb and Gutter, MAG Std Dtl 220, Type A	LF	100	$ 25.00	$ 2,500.00
340 - 3	Concrete Sidewalk, 5 foot MAG Std Dtl 230	SY	56	$ 60.00	$ 3,360.00
340 - 4	Concrete Driveway Replacement MAG Std Dtl 230	SY	138	$ 68.00	$ 9,384.00
350 - 1	Remove Existing Pipe Culvert	LF	356	$ 20.00	$ 7,120.00
350 - 2	Remove Existing Concrete Headwall	EA	10	$ 1,500.00	$ 15,000.00
350 - 3	Remove Existing Concrete Curb and Gutter	LF	100	$ 5.00	$ 500.00
350 - 4	Remove Existing Concrete Sidewalk	SY	56	$ 2.00	$ 112.00
350 - 5	Remove Existing Stormdrain	LF	16	$ 40.00	$ 640.00
350 - 6	Remove Existing Concrete Driveway	SY	138	$ 5.00	$ 690.00
350 - 7	Remove Block Wall	LF	33	$ 20.00	$ 660.00
350 - 8	Remove Single Curb	LF	28	$ 7.00	$ 196.00
401 - 1	Traffic Control	LS	1	$ 80,000.00	$ 80,000.00
430 - 1	Remove and Stockpile Topsoil	SY	17354	$ 0.10	$ 1,735.40
430 - 2	Topsoil Plating and Grading (Distribute Desert Varnish)	SY	17671	$ 0.60	$ 10,602.60
430 - 3	Salvage, Relocation, and Planting of Existing Tree	EA	3	$ 1,500.00	$ 4,500.00
430 - 4	Salvage, Relocation, and Planting of Existing Saguaro	LF	290	$ 32.00	$ 9,280.00
430 - 5	Salvage, Relocation, and Planting of Existing Cacti	EA	30	$ 50.00	$ 1,500.00
430 - 6	Tall Pot Trees	EA	78	$ 78.00	$ 6,084.00
430 - 7	Container Trees	EA	26	$ 100.00	$ 2,600.00
430 - 7A	24-inch Box Trees	EA	5	$ 500.00	$ 2,500.00
430 - 8	Container Shrubs (5 GALLON)	EA	99	$ 18.00	$ 1,782.00
430 - 9	Container Shrubs (1 GALLON)	EA	852	$ 9.00	$ 7,668.00
430 - 10	Container Cacti (5 GALLON)	EA	31	$ 25.00	$ 775.00
430 - 11	Landscaping Hydroseed Mix (Type A Mix)	AC	7	$ 2,500.00	$ 18,650.00
430 - 12	Landscaping Hydroseed Mix (Type B Mix)	AC	4	$ 2,500.00	$ 10,100.00
440 - 1	Landscape Irrigation System	LS	1	$ 24,000.00	$ 24,000.00
460 - 1	3.5 foot x 2.5 foot x 2 foot Landscape Boulder	EA	42	$ 130.00	$ 5,460.00
460 - 2	4 foot x 3 foot x 2.5 foot Landscape Boulder	EA	44	$ 180.00	$ 7,920.00
460 - 3	5 foot x 3.5 foot x 3 foot Landscape Boulder	EA	24	$ 340.00	$ 8,160.00
460 - 4	Erosion Blanket Structure No. 15 (DT 2)	LS	1	$ 14,200.00	$ 14,200.00
460 - 5	NOT USED				
505 - 1	Single Barrel 7 foot X 4 foot Reinforced Box Culvert, Detail ST 2	LF	89	$ 800.00	$ 71,200.00
505 - 2	Headwall 50-in by 31-in Arch Pipe, MAG Std Dtl 501-3	EA	1	$ 3,000.00	$ 3,000.00
505 - 3	Single Concrete Catch Basin, MAG Std Dtl 537-Modified	EA	8	$ 2,500.00	$ 20,000.00
505 - 4	Double Concrete Catch Basin, MAG Std Dtl 537-Modified	EA	3	$ 4,000.00	$ 12,000.00
505 - 4A	Curb Opening Catch Basin Type B, MAG Std Dtl 531	EA	2	$ 5,000.00	$ 10,000.00
505 - 5	Structure No. 1-Headwall 48-in Pipe, w/formliner and color, MAG Std Dtl 501-3	EA	1	$ 6,500.00	$ 6,500.00
505 - 6	Structure No. 2-Impact Energy Dissipator w/formliner and color, Detail ST 3	EA	1	$ 38,600.00	$ 38,600.00
505 - 7	Structure No. 3-Junction Structure (7-ft by 4-ft box to twin 54-in pipes), Detail ST 4	EA	1	$ 15,300.00	$ 15,300.00
505 - 8	Structure No. 4-Splitter Structure, Detail ST 5	EA	1	$ 92,610.00	$ 92,610.00
505 - 9	NOT USED				
505 - 10	Structure No. 5-Junction Structure, Detail ST6, STA 20+00	EA	1	$ 10,600.00	$ 10,600.00
505 - 11	Structure No. 6-Junction Structure, Detail ST6, STA 25+47	EA	1	$ 10,600.00	$ 10,600.00
505 - 12	Structure No. 7-Junction Structure, Detail ST6, STA 33+78	EA	1	$ 10,600.00	$ 10,600.00
505 - 13	Structure No. 8-Junction Structure, Detail ST6, STA 36+98	EA	1	$ 11,200.00	$ 11,200.00
505 - 14	Structure No. 9-Junction Structure, Detail ST6, STA 52+61	EA	1	$ 10,800.00	$ 10,800.00

Engineer's Opinion of Probable Cost

Kimley-Horn and Associates, Inc.

ITEM NO.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	AMOUNT
505 - 15	Structure No. 10-Junction Structure, Detail ST6, STA 57+00	EA	1	$ 10,800.00	$ 10,800.00
505 - 16	Structure No. 11-Junction Structure (72-in to 72-in Bend, Detail ST7)	EA	1	$ 13,500.00	$ 13,500.00
505 - 17	Structure No. 12-Junction Structure (72-in to twin 54-in bend, Detail ST8)	EA	1	$ 13,600.00	$ 13,600.00
505 - 18	Structure No. 13-Inlet Stucture (Thunder Mountain, Detail ST9)	EA	1	$ 20,300.00	$ 20,300.00
505 - 19	Structure No. 14-Headwall 48-in Pipe, w/formliner, color, and trashrack MAG Std Dtl 501-3	EA	1	$ 8,000.00	$ 8,000.00
505 - 20	Structure No. 15-Headwall Triple 42-in Pipe, w/formliner and color MAG Std Dtl 501-3	EA	1	$ 11,000.00	$ 11,000.00
505 - 21	Structure No. 16-Emergency Spillway Control Sill (Detail DT 1)	EA	1	$ 7,500.00	$ 7,500.00
505 - 22A	Pipe Collar Twin 54" Pipe (MAG Std Dtl 505)	EA	2	$ 2,000.00	$ 4,000.00
506 - 22B	Connect to Existing 24" Stormdrain Pipe (MAG Std Dtl 505)	EA	3	$ 1,250.00	$ 3,750.00
510 - 1	Concrete Block Masonry Wall	LF	33	$ 200.00	$ 6,600.00
510 - 2	Wrought Iron Access Gate	LS	1	$ 2,500.00	$ 2,500.00
520 - 1	Steel Handrail (MAG Std Dtl 145)	LF	154	$ 45.00	$ 6,930.00
520 - 2	Tubular Steel Ornamental Fence (Dwg ST9)	LS	1	$ 6,500.00	$ 6,500.00
610 - 1	8 inch ACP water line vertical realignment (MAG Std Dtl 370)	LF	105	$ 90.00	$ 9,450.00
610 - 2	8 inch ACP water line section replacement (MAG Std Dtl 403-3)	LF	77	$ 85.00	$ 6,545.00
610 - 2A	6 inch ACP water line section replacement (MAG Std Dtl 403-3)	LF	16	$ 80.00	$ 1,280.00
610 - 3	12 inch ACP water line vertical realignment (MAG Std Dtl 370)	LF	26	$ 95.00	$ 2,470.00
610 - 4	12 inch ACP water line section replacement (MAG Std Dtl 403-3)	LF	32	$ 90.00	$ 2,880.00
610 - 5	16 inch DIP water line vertical realignment (Dtl UT1 and UT2)	LF	93	$ 150.00	$ 13,950.00
610 - 6	20 inch DIP water line realignment (Dtl UT1 and UT2)	LF	20	$ 180.00	$ 3,600.00
615 - 1	8 inch PVC Sanitary Sewer Pipe	LF	2643	$ 65.00	$ 171,795.00
615 - 2	Cap Existing Sanitary Sewer Line (MAG 427)	EA	17	$ 600.00	$ 10,200.00
615 - 3	New Household Sewer Connection (MAG Std Dtl 440-1)	EA	9	$ 300.00	$ 2,700.00
615 - 4	Water Line / Sanitary Sewer Pipe Support (MAG Std Dtl 403-3)	LF	121	$ 75.00	$ 9,075.00
615 - 5	4-in PVC Sanitary Sewer/Ferric Chloride DIP Section (DWG SD15)	EA	1	$ 5,500.00	$ 5,500.00
618 - 1	18 inch Class III R.G.R.C.P.	LF	484	$ 120.00	$ 58,080.00
618 - 1A	18 inch Class V R.G.R.C.P., Concrete Encased	LF	276	$ 168.00	$ 46,368.00
618 - 2	24 inch Class III R.G.R.C.P.	LF	377	$ 150.00	$ 56,550.00
618 - 3	24 inch Class V R.G.R.C.P., Concrete Encased	LF	28	$ 200.00	$ 5,600.00
618 - 4	48 inch Class III R.G.R.C.P.	LF	669	$ 288.00	$ 192,672.00
618 - 5	48 inch Class V R.G.R.C.P.	LF	124	$ 302.00	$ 37,448.00
618 - 5A	50 inch by 31 inch Reinforced Concrete Arch Pipe Class III	LF	8	$ 350.00	$ 2,800.00
618 - 6	54 inch Class III R.G.R.C.P.	LF	934	$ 330.00	$ 308,220.00
618 - 7	54 inch Class V R.G.R.C.P.	LF	372	$ 354.00	$ 131,688.00
618 - 8	42 inch Class V R.G.R.C.P.	LF	555	$ 264.00	$ 146,520.00
618 - 9	72 inch Class III R.G.R.C.P.	LF	2458	$ 480.00	$ 1,179,840.00
618 - 10	78 inch Class III R.G.R.C.P.	LF	2380	$ 540.00	$ 1,285,200.00
618 - 11	90 inch Class III R.G.R.C.P.	LF	445	$ 630.00	$ 280,350.00
618 - 12	18 inch End Section (MAG Std Detail 545)	EA	15	$ 600.00	$ 9,000.00
618 - 13	54 Inch by 54 Inch Prefabricated Bend	EA	2	$ 2,500.00	$ 5,000.00
618 - 14	90 Inch by 90 Inch by 18 Inch Prefabricated Tee	EA	1	$ 3,000.00	$ 3,000.00
618 - 15	90 Inch by 90 Inch by 18 Inch Prefabricated Tangential Tee	EA	1	$ 3,000.00	$ 3,000.00
618 - 16	78 Inch by 78 Inch by 24 Inch Prefabricated Tee	EA	1	$ 2,500.00	$ 2,500.00
618 - 17	78 Inch by 78 Inch by 18 Inch Prefabricated Tee	EA	1	$ 2,500.00	$ 2,500.00
618 - 18	72 Inch by 72 Inch by 24 Inch Prefabricated Tee	EA	1	$ 2,300.00	$ 2,300.00
618 - 19	72 Inch by 72 Inch by 18 Inch Prefabricated Tee	EA	2	$ 2,300.00	$ 4,600.00
618 - 20	Access Barrier, COP Dtl P-1563 (48-inch)	EA	2	$ 700.00	$ 1,400.00
618 - 21	Access Barrier, COP Dtl P-1563 (54-inch)	EA	2	$ 800.00	$ 1,600.00
618 - 22	Access Barrier, COP Dtl P-1563 (42-inch)	EA	3	$ 600.00	$ 1,800.00
618 - 23	Restrictor Plate (41-inch)	EA	1	$ 500.00	$ 500.00
618 - 24	Plug Existing Storm Drain (MAG Std Dtl 427)	EA	3	$ 150.00	$ 450.00
618 - 25	Object Marker (MAG Std Dtl M -23 and M - 24, Type 3(1)L	EA	12	$ 100.00	$ 1,200.00
618 - 26	Object Marker (MAG Std Dtl M -23 and M - 24, Type 3(1)R	EA	12	$ 100.00	$ 1,200.00
625 - 1	Sanitary Sewer Manhole, 5-ft Diameter, MAG Std Dtls 420 and 424	EA	8	$ 5,500.00	$ 44,000.00
625 - 2	Storm Drain Manhole, 5-ft Diameter, MAG Std Dtls 520 and 420	EA	2	$ 5,500.00	$ 11,000.00
625 - 3	Storm Drain Manhole, 5-ft Diameter, MAG Std Dtls 521 and 420	EA	5	$ 5,500.00	$ 27,500.00
625 - 4	Storm Drain Manhole, COP Dtl P-1560 and MAG Std Dtl 420	EA	3	$ 5,500.00	$ 16,500.00
625 - 5	Storm Drain Shaft, 5-ft Diameter, MAG Std Dtl 420-2	EA	12	$ 1,500.00	$ 18,000.00

Construction Cost Subtotal	$5,460,855.00

Cos[illegible]timate
Unit Cost Data

Kimley-Horn and Associates, Inc.

ITEM No.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	COMMENTS
105 - 1	Partnering Allowance	LS	1	$ 20,000.00	Cost from Flood Control District
107 - 1	AZDES/SWPPP Permits	LS	1	$ 15,000.00	Cost from Flood Control District
107 - 2	Public Information and Notification Allowance	LS	1	$ 30,000.00	Cost from Flood Control District
107 - 3	Project Signs Allowance	LS	1	$ 5,000.00	Cost from Flood Control District
107 - 4	Water Management	LS	1	$ 15,000.00	Cost from Flood Control District
202 - 1	Mobilization	LS	1	$ 150,000.00	3% of Final Construction Cost
215 - 1	Drainage Excavation	CY	16500	$ 13.00	$8.00 at Ironwood Drive. $13 includes construction DS embankment to 'dam' standard in detention basin.
220 - 1	Riprap Construction Type I	SY	411	$ 80.00	Ironwood Drive
220 - 2	Riprap Construction Type II	SY	48	$ 85.00	Ironwood Drive
220 - 3	Riprap Construction Type III	SY	73	$ 90.00	Ironwood Drive
322 - 1	Permanent Pavement Overlay (Structural Section 2)	SY	364	$ 28.00	Ironwood Drive
336 - 1	Permanent Pavement Replacement (Structural Section 1) (COM M19.4 and MAG 200 Type B, T Top)	SY	1349	$ 28.00	Ironwood Drive
336 - 2	NOT USED	0	0	$ -	
336 - 3	Resurface Driveway w/h 4 inches of AB	SY	1631	$ 25.00	Ironwood Drive
340 - 1	Concrete Curb, Single Curb, MAG Std Dtl 222, Type A	LF	28	$ 11.00	Ironwood Drive
340 - 2	Concrete Curb and Gutter, MAG Std Dtl 220, Type A	LF	100	$ 18.00	Bethany Home Road
340 - 3	Concrete Sidewalk, 5 foot MAG Std Dtl 230	SY	56	$ 60.00	Iwood and 31st Avenue
340 - 4	Concrete Driveway Replacement MAG Std Dtl 230	SY	138	$ 68.00	Iwood and 31st Avenue
350 - 1	Remove Existing Pipe Culvert	LF	356	$ 20.00	
350 - 2	Remove Existing Concrete Headwall	EA	10	$ 1,500.00	71st and Mescal
350 - 3	Remove Existing Concrete Curb and Gutter	LF	100	$ 5.00	71st and Mescal
350 - 4	Remove Existing Concrete Sidewalk	SY	56	$ 2.00	71st and Mescal
350 - 5	Remove Existing Stormdrain	LF	16	$ 40.00	71st and Mescal
350 - 6	Remove Existing Concrete Driveway	SY	138	$ 5.00	Bethany Home Road
350 - 7	Remove Block Wall	LF	33	$ 20.00	
350 - 8	Remove Single Curb	LF	28	$ 7.00	71st and Mescal
401 - 1	Traffic Control	LS	1	$ 80,000.00	
430 - 1	Remove and Stockpile Topsoil	SY	17354	$ 0.10	
430 - 2	Topsoil Plating and Grading (Distribute Desert Varnish)	SY	17671	$ 0.60	
430 - 3	Salvage, Relocation, and Planting of Existing Tree	EA	3	$ 1,500.00	
430 - 4	Salvage, Relocation, and Planting of Existing Saguaro	LF	290	$ 32.00	
430 - 5	Salvage, Relocation, and Planting of Existing Cacti	EA	30	$ 50.00	
430 - 6	Tall Pot Trees	EA	78	$ 78.00	
430 - 7	Container Trees	EA	26	$ 100.00	
430 - 7A	24-inch Box Trees	EA	5	$ 500.00	
430 - 8	Container Shrubs (5 GALLON)	EA	98	$ 18.00	
430 - 9	Container Shrubs (1 GALLON)	EA	852	$ 9.00	
430 - 10	Container Cacti (5 GALLON)	EA	31	$ 25.00	
430 - 11	Landscaping Hydroseed Mix (Type A Mix)	AC	7	$ 2,500.00	
430 - 12	Landscaping Hydroseed Mix (Type B Mix)	AC	4	$ 2,500.00	
440 - 1	Landscape Irrigation System	LS	1	$ 24,000.00	
460 - 1	3.5 foot x 2.5 foot x 2 foot Landscape Boulder	EA	42	$ 130.00	
460 - 2	4 foot x 3 foot x 2.5 foot Landscape Boulder	EA	44	$ 180.00	
460 - 3	5 foot x 3.5 foot x 3 foot Landscape Boulder	EA	24	$ 340.00	
460 - 4	Erosion Blanket Structure No. 15 (DT 2)	LS	1	$ 14,200.00	
460 - 5	NOT USED				
505 - 1	Single Barrel 7 foot X 4 foot Reinforced Box Culvert, Detail ST 2	LF	89	$ 800.00	Rdwy Spreadsheet
505 - 2	Headwall 50-in by 31-in Arch Pipe, MAG Std Dtl 501-3	EA	1	$ 3,000.00	Bethany Home Road
505 - 3	Single Concrete Catch Basin, MAG Std Dtl 537-Modified	EA	7	$ 2,500.00	Bethany Home Road
505 - 4	Double Concrete Catch Basin, MAG Std Dtl 537-Modified	EA	7	$ 4,000.00	51st Avenue
505 - 4A	Curb Opening Catch Basin Type B, MAG Std Dtl 531	EA	1	$ 4,000.00	31 st Avenue and Deer Valley
505 - 5	Structure No. 1-Headwall 48-in Pipe, w/formliner and color, MAG Std Dtl 501-3	EA	1	$ 6,500.00	Standard Headwall-$4,000; Formliner-$2,000; Color $500
505 - 6	Structure No. 2-Impact Energy Dissipator w/formliner and color, Detail ST 3	EA	1	$ 38,600.00	Structural Cost Estimate.
505 - 7	Structure No. 3-Junction Structure (7-ft by 4-ft box to twin 54-in pipes), Detail ST 4	EA	1	$ 15,300.00	Structural Cost Estimate.
505 - 8	Structure No. 4-Splitter Structure, Detail ST 5	EA	1	$ 92,610.00	Structural Cost Estimate.
505 - 9	NOT USED				
505 - 10	Structure No. 5-Junction Structure, Detail ST6, STA 20+00	EA	1	$ 10,600.00	Structural Cost Estimate.
505 - 11	Structure No. 6-Junction Structure, Detail ST6, STA 25+47	EA	1	$ 10,600.00	Structural Cost Estimate.

Cost [illegible]timate
Unit Cost Data

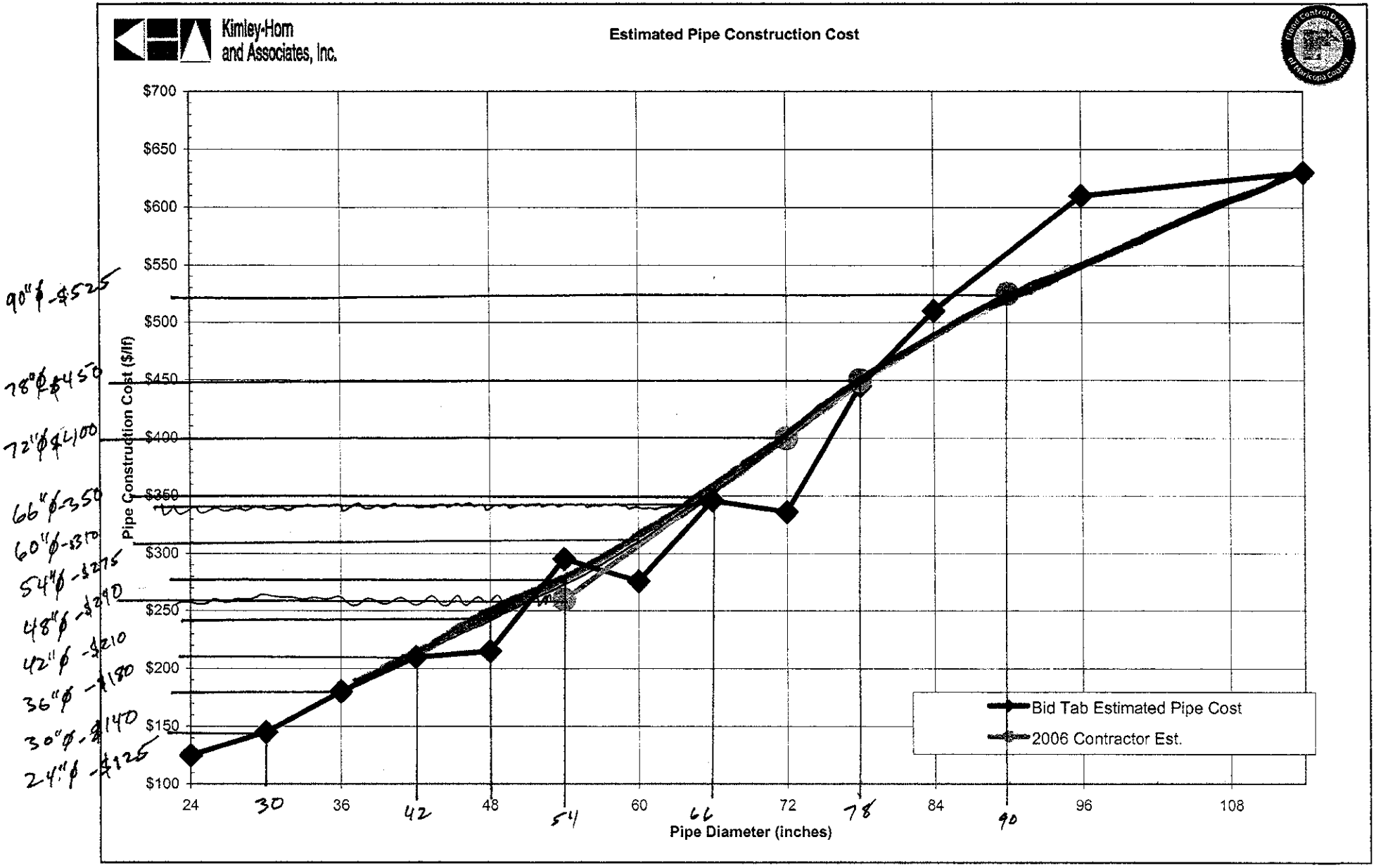
Kimley-Horn and Associates, Inc.

ITEM NO.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	COMMENTS
505 - 12	Structure No. 7-Junction Structure, Detail ST6, STA 33+78	EA	1	$ 10,600.00	Structural Cost Estimate.
505 - 13	Structure No. 8-Junction Structure, Detail ST6, STA 36+98	EA	1	$ 10,700.00	Structural Cost Estimate.
505 - 14	Structure No. 9-Junction Structure, Detail ST6, STA 52+61	EA	1	$ 10,800.00	Structural Cost Estimate.
505 - 15	Structure No. 10-Junction Structure, Detail ST6, STA 57+00	EA	1	$ 10,800.00	Structural Cost Estimate.
505 - 16	Structure No. 11-Junction Structure (72-in to 72-in Bend, Detail ST7)	EA	1	$ 13,500.00	Structural Cost Estimate.
505 - 17	Structure No. 12-Junction Structure (72-in to twin 54-in bend, Detail ST8)	EA	1	$ 13,600.00	Structural Cost Estimate.
505 - 18	Structure No. 13-Inlet Stucture (Thunder Mountain, Detail ST9)	EA	1	$ 20,300.00	Structural Cost Estimate.
505 - 19	Structure No. 14-Headwall 48-in Pipe, w/formliner, color, and trashrack MAG Std Dtl 501-3	EA	1	$ 8,000.00	Standard Headwall-$4,000; Formliner-$2,000; Color $500; Trashrack-$1,500
505 - 20	Structure No. 15-Headwall Triple 42-in Pipe, w/formliner and color MAG Std Dtl 501-3	EA	1	$ 11,000.00	Standard Headwall-$6,000; Formliner-$2,000; Color $500; Trashrack-$2,500
505 - 21	Structure No. 16-Emergency Spillway Control Sill (Detail DT 1)	EA	1	$ 7,500.00	Concrete Estimate Riprap is in 220-1
505 - 22A	Pipe Collar Twin 54" Pipe (MAG Std Dtl 505)	EA	2	$ 2,000.00	43rd Avenue
506 - 22B	Connect to Existing 24" Stormdrain Pipe (MAG Std Dtl 505)	EA	1	$ 1,250.00	
510 - 1	Concrete Block Masonry Wall	LF	33	$ 200.00	
510 - 2	Wrought Iron Access Gate	LS	1	$ 2,500.00	Estimate from a manufacturer
520 - 1	Steel Handrail (MAG Std Dtl 145)	LF	154	$ 45.00	Typical MAG cost
520 - 2	Tubular Steel Ornamental Fence (Dwg ST9)	LS	1	$ 6,500.00	
610 - 1	8 inch ACP water line vertical realignment (MAG Std Dtl 370)	LF	105	$ 90.00	31st Avenue and Deer Valley and Bethany Home Road
610 - 2	8 inch ACP water line section replacement (MAG Std Dtl 403-3)	LF	77	$ 85.00	71st Street and Mescall
610 - 2A	6 inch ACP water line section replacement (MAG Std Dtl 403-3)	LF	16	$ 80.00	Extrapoate from 8-iinch
610 - 3	12 inch ACP water line vertical realignment (MAG Std Dtl 370)	LF	26	$ 95.00	Brandon Squire Bid Tab
610 - 4	12 inch ACP water line section replacement (MAG Std Dtl 403-3)	LF	32	$ 90.00	Brandon Squire Bid Tab
610 - 5	16 inch DIP water line vertical realignment (Dtl UT1 and UT2)	LF	93	$ 150.00	
610 - 6	20 inch DIP water line realignment (Dtl UT1 and UT2)	LF	20	$ 180.00	
615 - 1	8 inch PVC Sanitary Sewer Pipe	LF	2643	$ 65.00	26th Avenue and Verde Lane
615 - 2	Cap Existing Sanitary Sewer Line (MAG 427)	EA	17	$ 600.00	$200 for Capping existing sewer, $400 for old connection removal in SD trench
615 - 3	New Household Sewer Connection (MAG Std Dtl 440-1)	EA	10	$ 300.00	
615 - 4	Water Line / Sanitary Sewer Pipe Support (MAG Std Dtl 403-3)	LF	153	$ 75.00	Extrapoate from 8-inch water
615 - 5	4-in PVC Sanitary Sewer/Ferric Chloride DIP Section (DWG SD15)	EA	1	$ 5,500.00	Cost from City of Mesa
618 - 1	18 inch Class III R.G.R.C.P.	LF	421	$ 120.00	Bid Tabs plus constructibility factor
618 - 1A	18 inch Class V R.G.R.C.P., Concrete Encased	LF	314	$ 168.00	Add cost of concrete encasemet to typical 18-inch dia. RCP
618 - 2	24 inch Class III R.G.R.C.P.	LF	368	$ 150.00	Bid Tabs plus constructibility factor
618 - 3	24 inch Class V R.G.R.C.P., Concrete Encased	LF	16	$ 198.00	Add cost of concrete encasemet to typical 24-inch dia. RCP
618 - 4	48 inch Class III R.G.R.C.P.	LF	669	$ 288.00	Bid Tabs plus constructibility factor
618 - 5	48 inch Class V R.G.R.C.P.	LF	124	$ 302.00	Bid Tabs; Add $12 per lf for Class V per Rinker
618 - 5A	50 inch by 31 inch Reinforced Concrete Arch Pipe Class III	LF	8	$ 350.00	
618 - 6	54 inch Class III R.G.R.C.P.	LF	934	$ 330.00	Bid Tabs plus constructibility factor
618 - 7	54 inch Class V R.G.R.C.P.	LF	372	$ 354.00	Bid Tabs; Add $20 per lf for Class V per Rinker
618 - 8	42 inch Class V R.G.R.C.P.	LF	555	$ 264.00	Bid Tabs; Add $10 per lf for Class V; Added constructibility factor of 20%
618 - 9	72 inch Class III R.G.R.C.P.	LF	2458	$ 480.00	Bid Tabs plus constructibility factor of 20%
618 - 10	78 inch Class III R.G.R.C.P.	LF	2380	$ 540.00	Bid Tabs plus constructibility factor of 20%
618 - 11	90 inch Class III R.G.R.C.P.	LF	445	$ 630.00	Bid Tabs plus constructibility factor of 20%
618 - 12	18 inch End Section (MAG Std Detail 545)	EA	15	$ 600.00	Rinker
618 - 13	54 Inch by 54 Inch Prefabricated Bend	EA	2	$ 2,500.00	Rinker
618 - 14	90 Inch by 90 Inch by 18 Inch Prefabricated Tee	EA	1	$ 3,000.00	Rinker
618 - 15	90 Inch by 90 Inch by 18 Inch Prefabricated Tangential Tee	EA	1	$ 3,000.00	Rinker
618 - 16	78 Inch by 78 Inch by 24 Inch Prefabricated Tee	EA	1	$ 2,500.00	Rinker
618 - 17	78 Inch by 78 Inch by 18 Inch Prefabricated Tee	EA	1	$ 2,500.00	Rinker
618 - 18	72 Inch by 72 Inch by 24 Inch Prefabricated Tee	EA	1	$ 2,300.00	Rinker
618 - 19	72 Inch by 72 Inch by 18 Inch Prefabricated Tee	EA	2	$ 2,300.00	Rinker
618 - 20	Access Barrier, COP Dtl P-1563 (48-inch)	EA	2	$ 700.00	
618 - 21	Access Barrier, COP Dtl P-1563 (54-inch)	EA	2	$ 800.00	
618 - 22	Access Barrier, COP Dtl P-1563 (42-inch)	EA	3	$ 600.00	
618 - 23	Restrictor Plate (41-inch)	EA	1	$ 500.00	
618 - 24	Plug Existing Storm Drain (MAG Std Dtl 427)	EA	2	$ 150.00	
618 - 25	Object Marker (ADOT Std Dtl M -23 and M - 24, Type 3(1)L	EA	12	$ 100.00	
618 - 26	Object Marker (ADOT Std Dtl M -23 and M - 24, Type 3(1)R	EA	12	$ 100.00	
625 - 1	Sanitary Sewer Manhole, 5-ft Diameter, MAG Std Dtls 420 and 424	EA	8	$ 5,500.00	Various typical projects. Added $1000 for 5-foot diameter
625 - 2	Storm Drain Manhole, 5-ft Diameter, MAG Std Dtls 520 and 420	EA	2	$ 5,500.00	Various typical projects. Added $1000 for 5-foot diameter
625 - 3	Storm Drain Manhole, 5-ft Diameter, MAG Std Dtls 521 and 420	EA	6	$ 5,500.00	Various typical projects. Added $1000 for 5-foot diameter
625 - 4	Storm Drain Manhole, COP Dtl P-1560 and MAG Std Dtl 420	EA	3	$ 5,500.00	Various typical projects. Added $1000 for 5-foot diameter
625 - 5	Storm Drain Shaft, 5-ft Diameter, MAG Std Dtl 420-2	EA	12	$ 1,500.00	Various typical projects. Added $1000 for 5-foot diameter
	Construction Cost Subtotal				

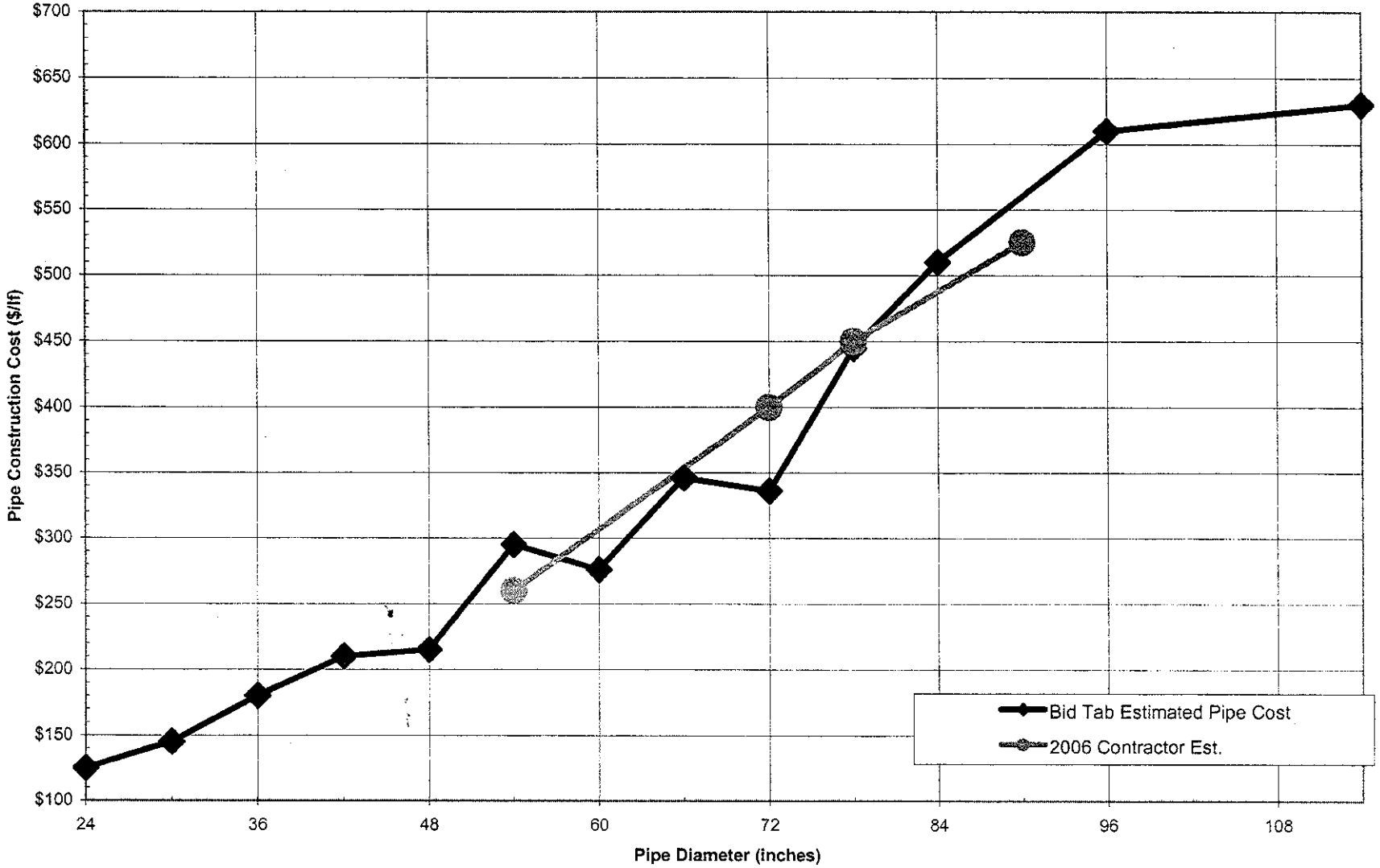
Kimley-Horn and Associates, Inc.

Final Estimate of Unit Pipe Cost

Pipe Size (inches)	Class	Quantity	Summary Unit Cost	Constructibility Factor	Final EE Unit Cost ($/lf)
18	III	421	$100	1.2	$120
18	V	314	$140	1.2	$168
24	III	368	$125	1.2	$150
24	V	16	$165	1.2	$198
42	V	555	$220	1.2	$264
50X31	III	8	$350	1.0	$350
48	III	669	$240	1.2	$288
48	V	124	$252	1.2	$302
54	III	934	$275	1.2	$330
54	V	372	$295	1.2	$354
72	III	2458	$400	1.2	$480
78	III	2380	$450	1.2	$540
90	III	445	$525	1.2	$630


Kimley-Horn and Associates, Inc.
Estimated Pipe Construction Cost
Pipe Construction Cost ($/lf)
$700
$650
$600
$550
$500
$450
$400
$350
$300
$250
$200
$150
$100
24
30
36
42
48
54
60
66
72
78
84
90
96
108
Pipe Diameter (inches)
Bid Tab Estimated Pipe Cost
2006 Contractor Est.
90"ϕ-$525
78"ϕ-$450
72"ϕ-$400
66"ϕ-$350
60"ϕ-$310
54"ϕ-$275
48"ϕ-$240
42"ϕ-$210
36"ϕ-$180
30"ϕ-$140
24"ϕ-$125

Kimley-Horn and Associates, Inc.



Kimley-Horn and Associates, Inc.

Bid Tab Pipe Cost Information

Source	Date	Project	Item	Pipe Diameter (ft)	Quantity (lf)	Average Cost (LF)	Inflation Factor	2006 Unit Cost	Comment
FCD	6/19/1999	43rd Avenue Storm Drain	114-inch diameter concrete pipe	114	4420	$420	1.5	$630	Does not include Engineer's Estimate of $525
								$630	
FCD	6/19/1999	43rd Avenue Storm Drain	96-inch diameter concrete pipe	96	60	$377	1.5	$566	Does not include Engineer's Estimate of $340
COP	5/24/2005	75th Avenue-Salt-Papago	96-inch diameter storm sewer pipe	96	4657	$569	1.15	$654	EE $358
								$610	
FCD	1/6/2005	71st Street & Mescal	84-inch diameter concrete pipe	84	1867	$430	1.2	$516	Does not include Engineer's Estimate of $450/lf and low bid of $180/lf
FCD	6/19/1999	43rd Avenue Storm Drain	84-inch diameter concrete pipe	84	60	$335	1.5	$503	Does not include Engineer's Estimate of $250
								$510	
FCD	1/6/2005	71st Street & Mescal	78-inch diameter CIPP	78	658	$380	1.2	$456	Does not include Engineer's Estimate of $400/lf and low bid of $130/lf
COP	5/24/2005	75th Avenue-Salt-Papago	78-inch diameter storm sewer pipe	78	4951	$454	1.15	$522	EE $245
ADOT	10/19/2004	59th Ave/Glendale	78-inch dia. Class III RCP	78		$297	1.2	$356	EE $230; Unknown Quantity
								$445	
ADOT	10/19/2004	59th Ave/Glendale	72-inch dia. Class II RCP	72		$312	1.2	$374	EE $180 w/elbow; unknown quantity
ADOT	10/19/2004	59th Ave/Glendale	72-inch dia. Class III RCP	72		$276	1.2	$331	EE $200, unknown quantity
FCD	6/19/1999	43rd Avenue Storm Drain	72-inch diameter concrete pipe	72	720	$220	1.5	$330	Does not include Engineer's Estimate of $200
FCD	6/19/1999	43rd Avenue Storm Drain	72-inch diameter concrete pipe	72	200	$206	1.5	$309	CLASS IV-Does not include Engineer's Estimate of $200
								$336	
FCD	6/19/1999	43rd Avenue Storm Drain	66-inch diameter concrete pipe	66	2193	$195	1.5	$293	Does not include EE of $190
COP	5/24/2005	75th Avenue-Salt-Papago	66-inch diameter storm sewer pipe	66	4389	$344	1.15	$396	EE $240
								$346	
ADOT	10/19/2004	59th Ave/Glendale	60-inch dia. Class III RCP	60		$230	1.2	$276	EE $160
								$276	
FCD	6/19/1999	43rd Avenue Storm Drain	54-inch diameter concrete pipe	54	73	$197	1.5	$296	Does not include EE of $112
COP	2/8/2005	7th Avenue and Dunlap	54-inch diameter storm sewer pipe	54	1886	$255	1.15	$293	EE $170
								$295	
COP	2/8/2005	7th Avenue and Dunlap	48-inch diameter storm sewer pipe	48	309	$201	1.2	$231	EE $150
COP	12/15/2005	26th Avenue	48-inch diameter concrete pipe	48	695	$175	1.2	$210	EE $210
FCD	2/2/2005	Bethany Home Outfall	48-inch diameter concrete pipe	48	136	$178	1.2	$204	Does not include Engineer's Estimate of $120
								$215	
COP	5/24/2005	75th Avenue-Salt-Papago	42-inch diameter storm sewer pipe	42	329	$294	1.15	$338	EE $174
ADOT	10/19/2004	59th Ave/Glendale	42-inch dia. Class III RCP	42		$175	1.2	$210	EE $75
								$210	Throw out $336
COP	5/16/2006	31st Avenue Storm Drain	36-inch diameter storm sewer pipe	36	1528	$180	1.0	$180	EE $180
COP	2/8/2005	7th Avenue and Dunlap	36-inch diameter storm sewer pipe	36	290	$146	1.2	$175	EE $100
ADOT	12/10/2004	Tatum and McDonald	36-inch dia. Class III RCP	36		$104	1.2	$125	EE $110
								$180	Throw out $125
COP	5/16/2006	31st Avenue Storm Drain	30-inch diameter storm sewer pipe	30	212	$160	1.0	$160	EE $150
ADOT	10/19/2004	59th Ave/Glendale	30-inch dia. Class III RCP	30		$109	1.2	$131	EE $60
								$145	
COP	5/16/2006	31st Avenue Storm Drain	24-inch diameter storm sewer pipe	24	1175	$125	1.0	$125	EE $100
COP	5/16/2006	31st Avenue/Foothills Storm Drain	24-inch diameter storm sewer pipe	24	654	$125	1.0	$125	EE $100, Same Contractor as 31st Avenue
								$125	

Inflation- 5% per year; 15% for 2005-2006

Jensen, David

From: [redacted]
Sent: Tuesday, October 31, 2006 10:34 AM
To: Jensen, David
Subject: Re: Fwd: Large Diameter RCP Construction Cost

Dave,

Here are some estimated bid costs for the pipe:

54-inch diameter Class III RCP - 935 feet; - $260/ft
72-inch diameter Class III RCP - 2,500 feet; - $400/ft
78-inch diameter Class III RCP - 2,400 feet; - $450/ft
90-inch diameter Class III RCP - 450 feet. - $525/ft

This includes slurry to spring line, native backfill on top of that and the buy unit prices listed below. Given the terrain or location of the work (traffic concerns, etc.) these would go up or down but this should be a pretty good baseline. Let me know if you have any more questions.

[redacted]

[redacted]>
[redacted]

>>> <david.jensen@kimley-horn.com> 10/30/2006 11:47 AM >>>

[redacted]

I was wondering if there was anyone at your office there that had an idea of large diameter pipe construction costs.

54-inch diameter Class III RCP - 935 feet;
72-inch diameter Class III RCP - 2,500 feet;
78-inch diameter Class III RCP - 2,400 feet;
90-inch diameter Class III RCP - 450 feet.

Rinker has given me a pipe cost, including delivery to east Mesa, of:
54-inch RCP - $95/LF;
72-inch RCP - $165/LF;
78-inch RCP - $190/LF;
90-inch RCP - $250/LF.

If you have an idea of know somebody with Sundt that could give me a ballpark figure, I would appreciate it.

Thanks

Dave Jensen

ATTN: Dave Jensen

To: Dave Jensen
From: Clay Wood - Rinker Materials
944-5500
906-1174

Kimley-Horn and Associates, Inc.

Pipe and Appurtenant Material Cost

Item No.	Item Description	Unit	Quantity	Material Unit Cost
618 - 1	18 inch Class III R.G.R.C.P.	LF	421	23.00/LF
618 - 1A	18 inch Class V R.G.R.C.P.,	LF	314	23.00/LF
618 - 2	24 inch Class III R.G.R.C.P.	LF	368	28.00/LF
618 - 3	24 inch Class V R.G.R.C.P.,	LF	16	32.00/LF
618 - 4	48 inch Class III R.G.R.C.P.	LF	669	78.00/LF
618 - 5	48 inch Class V R.G.R.C.P.	LF	124	90.00/LF
618 - 5A	50 inch by 31 inch Reinforced Concrete Arch Pipe Class III	LF	8	175.00/LF
618 - 6	54 inch Class III R.G.R.C.P.	LF	934	95.00/LF
618 - 7	54 inch Class V R.G.R.C.P.	LF	372	115.00/LF
618 - 8	42 inch Class V R.G.R.C.P.	LF	555	75.00/LF
618 - 9	72 inch Class III R.G.R.C.P.	LF	2458	165.00/LF
618 - 10	78 inch Class III R.G.R.C.P.	LF	2380	190.00/LF
618 - 11	90 inch Class III R.G.R.C.P.	LF	445	250.00/LF
618 - 12	18 inch End Section (MAG Std Detail 545)	EA	15	600.00/EA
618 - 12A	50 inch by 31 inch Reinforced Concrete Arch Pipe End Section Class III	EA	1	We Don't Manufacture
618 - 13	54 Inch by 54 Inch Prefabricated Bend	EA	2	2500.00/EA
618 - 14	90 Inch by 90 Inch by 18 Inch Prefabricated Tee	EA	1	3000.00/EA
618 - 15	90 Inch by 90 Inch by 18 Inch Prefabricated Tangential Tee	EA	1	3000.00/EA
618 - 16	78 Inch by 78 inch by 24 Inch Prefabricated Tee	EA	1	2500.00/EA
618 - 17	78 Inch by 78 Inch by 18 Inch Prefabricated Tee	EA	1	2500.00/EA
618 - 18	72 Inch by 72 Inch by 24 Inch Prefabricated Tee	EA	1	2500.00/EA
618 - 19	72 Inch by 72 Inch by 18 Inch Prefabricated Tee	EA	2	2500.00/EA

Location-McDowell Road and Sossaman Drive (76th Street) - Mesa

Concrete Structure Quantity Summary
60% Estimate

Structure Designation	Concrete Quantity (CY)	Unit Price ($/CY)	Project Construction Cost
#2	43.1	850	$36,635
#3	19.6	850	$16,618
#4	64.8	950	$61,513
#4a	46.1	950	$43,833
#5	16.0	700	$11,200
#6	16.0	700	$11,200
#7	16.1	700	$11,242
#8	16.1	700	$11,242
#9	20.8	700	$14,588
#10	20.8	700	$14,588
#11	23.2	700	$16,219
#12	23.0	700	$16,114
#13	32.4	800	$25,928
Totals	357.9		$290,919

Concrete Structure Quantity Summary
90% Estimate

Structure Designation	Concrete Quantity (CY)	Unit Price ($/CY)	Project Construction Cost
#2	45.4	850	$38,573
#3	18.0	850	$15,300
#4	66.9	950	$63,584
#4a	46.1	950	$43,833
#5	15.1	700	$10,591
#6	15.1	700	$10,591
#7	15.1	700	$10,591
#8	15.2	700	$10,654
#9	15.4	700	$10,801
#10	15.4	700	$10,801
#11	19.2	700	$13,468
#12	19.5	700	$13,615
#13	25.4	800	$20,304
Totals	332.0		$272,706

Concrete Structure Quantity Summary
PS&E Estimate

Structure Designation	Concrete Quantity (CY)	Unit Price ($/CY)	Project Construction Cost
#2	45.4	850	$38,573
#3	18.0	850	$15,300
#4	132.3	700	$92,610
#4a	0.0	950	$0
#5	15.1	700	$10,591
#6	15.1	700	$10,591
#7	15.1	700	$10,591
#8	15.2	700	$10,654
#9	15.4	700	$10,801
#10	15.4	700	$10,801
#11	19.2	700	$13,468
#12	19.5	700	$13,615
#13	25.4	800	$20,304
Totals	351.2		$257,899

Designed By: Kevin Kimm
Date: 10/17/200610:51 AM
Checked By:
Date:
Filename:C:\Documents and Settings\david.jensen\Local Settings\Temporary Internet Files\OLK25\quantitysummary.xls

Kimley-Horn and Associates, Inc.

Job McDowell Road Subject Cost Estimate Sheet No. ___ of ___
Job No. 091131012
Designed by DEJ Date 10/20/06 Checked by ___ Date ___

Cost Estimate

Structure No. 15

460-4 Erosion Blanket (Sheet DT2)

Boulders A - 34 x 130 = 4,420
B - 14 x 180 = 2,520
C - 9 x 340 = 3,060

$ 10,000

Slurry Mix
10 yds @ $100/yd³ = $1,000

Labor Crew $200/hour
Rock Placement 8 hrs max = $1,600
Slurry Mix 8 hrs max $1,600

TOTAL $14,200

Kimley-Horn and Associates, Inc.

Job McDowell Road Subject Cost Estimate Sheet No. ___ of ___
Job No. 091131012
Designed by DEJ Date 10/20/06 Checked by ___ Date ___

Cost Estimate

505-21 Emergency Spillway Control Sill
Structure No. 16

Concrete Quantity
$V = 0.3\ yd^3/ft$
$L = 50'$

$V = 50'(0.3\ yd^3/ft) = 15\ yd^3$

Concret Unit Cost $\$500/yd^3$ including forming, & steel

$Cost = 15\ yd^3 * \$500/yd^3 = \$7,500$

Riprap Cost is in 220-1

Jensen, David

From: Scott Peters [SPeters@epgaz.com]
Sent: Friday, October 27, 2006 2:47 PM
To: Jensen, David
Subject: RE: Backup for cost estimate data

Dave,

The price I sent you earlier for colored concrete appears to be low. The cost I have for concrete colorant is $2.50/lb. The color we are specifying (Davis Color Yosemite Brown) requires 2 lbs. of colorant per 94 lbs. of cement. Assuming 1 cy of concrete requires 600 lbs of cement (3000 psi concrete), I estimate the cost for colorant to be **$32.00 - $35.00/cy.**

also,

As for the cost for form liners, I have contacted a couple of product reps. to get current pricing and am waiting their response. Given that the prices I sent you in my earlier email are based on early 2006 costs and the cost for PVC and other similar materials have gone up significantly, you may consider doubling the cost for the form liners using **$25.00 - $30.00** a square face foot. I will let you know if I hear more from the product reps.

Scott

From: david.jensen@kimley-horn.com [mailto:david.jensen@kimley-horn.com]
Sent: Friday, October 27, 2006 11:46 AM
To: Scott Peters
Subject: Backup for cost estimate data

Scott-
Have you sent us any backup data for your cost estimate?

Dave

David Jensen, P.E., CFM
Kimley-Horn and Associates, Inc.
7878 North 16th Street
Suite 300
Phoenix, AZ 85020
602-944-5500
602-906-1174 Fax
602-906-1105 Direct
david.jensen@kimley-horn.com

****
This e-mail from Kimley-Horn and Associates, Inc. and any files transmitted with it may contain confidential information.
It is intended solely for the individual named above. If you are

Eichinger, Bob

From: Scott Vogel - FCDX [csv@mail.maricopa.gov]
Sent: Wednesday, October 04, 2006 10:53 AM
To: Eichinger, Bob
Subject: McDowell Items

Bob,

A few follow up items from our meeting yesterday:

- In the cost estimate, please increase the public information allowance to $30,000.
- In the cost estimate, the project signs allowance should be reduced to $5,000.

Thanks, Scott

Bid Tab Data

BID TAB						Blucor Contracting, Inc.		Haydon Building Corp.		Achen-Gardner Engineering, LLC		Higland Engineering, LLC	
Contract FCD 2004C041, 71st Street Storm Drain and Mescal Basin Improvements				ENGNEER's		402 E. Campbell Ave.		4640 E. McDowell Rd.		550 S. 79th St.		3640 N. 39th Ave.	
Bid Opening: Thursday, January 6, 2005				ESTIMATE		Gilbert, AZ 85234		Phoenix, AZ 85008		Chandler, AZ 85226		Phoenix, AZ 85019	
ITEM #	DESCRIPTION	UNIT	QTY	UNIT PRICE	BID TOTAL	UNIT PRICE	BID TOTAL	UNIT PRICE	BID TOTAL	UNIT PRICE	BID TOTAL	UNIT PRICE	BID TOTAL
105 - 1	Partnering Allowance	LS	1	$ 15,000.00	$ 15,000.00	$ 15,000.00	$ 15,000.00	$ 15,000.00	$ 15,000.00	$ 15,000.00	$ 15,000.00	$ 15,000.00	$ 15,000.00
107 - 1	AZPDES / SWPPP Permits	LS	1	$ 5,000.00	$ 5,000.00	$ 5,000.00	$ 5,000.00	$ 5,000.00	$ 5,000.00	$ 5,000.00	$ 5,000.00	$ 5,000.00	$ 5,000.00
107 - 2	Public Information and Notification Allowance	LS	1	$ 10,000.00	$ 10,000.00	$ 10,000.00	$ 10,000.00	$ 10,000.00	$ 10,000.00	$ 10,000.00	$ 10,000.00	$ 10,000.00	$ 10,000.00
107 - 3	Project Signs Allowance	LS	1	$ 6,000.00	$ 6,000.00	$ 6,000.00	$ 6,000.00	$ 6,000.00	$ 6,000.00	$ 6,000.00	$ 6,000.00	$ 6,000.00	$ 6,000.00
202 - 1	Mobilization	LS	1	$ 100,000.00	$ 100,000.00	$ 60,000.00	$ 60,000.00	$ 90,000.00	$ 90,000.00	$ 10,000.00	$ 10,000.00	$ 250,000.00	$ 250,000.00
211 - 1	Fill	CY	694	$ 5.00	$ 3,470.00	$ 4.00	$ 2,776.00	$ 15.00	$ 10,410.00	$ 60.00	$ 41,640.00	$ 15.00	$ 10,410.00
220 - 1	Grouted Rip Rap (Dmax=12")	SY	355	$ 75.00	$ 26,625.00	$ 39.00	$ 13,845.00	$ 70.00	$ 24,850.00	$ 45.00	$ 15,975.00	$ 55.00	$ 19,525.00
336 - 1	Asphalt Pavement (2" A.C.)	SY	843	$ 15.00	$ 12,645.00	$ 12.00	$ 10,116.00	$ 32.00	$ 26,976.00	$ 37.00	$ 31,191.00	$ 25.00	$ 21,075.00
336 - 2	Permanent Pavement Replacement (5" A.C.)	SY	1,719	$ 24.00	$ 41,256.00	$ 32.00	$ 55,008.00	$ 60.00	$ 103,140.00	$ 54.00	$ 92,826.00	$ 45.00	$ 77,355.00
340 - 1	Concrete Curb & Gutter, MAG Std Detail 220 Type A	LF	1,162	$ 18.00	$ 20,916.00	$ 10.00	$ 11,620.00	$ 14.00	$ 16,268.00	$ 16.00	$ 18,592.00	$ 17.00	$ 19,754.00
340 - 2	Concrete Ribbon Curb, MAG Std Detail 220 Type B	LF	72	$ 24.00	$ 1,728.00	$ 20.00	$ 1,440.00	$ 30.00	$ 2,160.00	$ 75.00	$ 5,400.00	$ 16.00	$ 1,152.00
340 - 3	Concrete Valley Gutter, MAG Std Detail 240	LF	885	$ 15.00	$ 13,275.00	$ 26.00	$ 23,010.00	$ 15.00	$ 13,275.00	$ 23.00	$ 20,355.00	$ 14.00	$ 12,390.00
343 - 1	Decorative Concrete Swale	SF	13,374	$ 5.25	$ 70,213.50	$ 10.00	$ 133,740.00	$ 13.00	$ 173,862.00	$ 15.00	$ 200,610.00	$ 14.00	$ 187,236.00
350 - 1	Removal of Existing Improvements	LS	1	$ 50,000.00	$ 50,000.00	$ 2,698.00	$ 2,698.00	$ 10,000.00	$ 10,000.00	$ 65,000.00	$ 65,000.00	$ 50,000.00	$ 50,000.00
350 - 2	Remove Pavement	SY	4,185	$ 1.00	$ 4,185.00	$ 1.00	$ 4,185.00	$ 6.00	$ 25,110.00	$ 6.85	$ 28,667.25	$ 3.00	$ 12,555.00
350 - 3	Remove Concrete Curb	LF	1,248	$ 7.00	$ 8,736.00	$ 3.00	$ 3,744.00	$ 5.00	$ 6,240.00	$ 7.00	$ 8,736.00	$ 5.00	$ 6,240.00
350 - 4	Remove Concrete Lining	LS	1	$ 100,000.00	$ 100,000.00	$ 8,960.00	$ 8,960.00	$ 4,000.00	$ 4,000.00	$ 8,000.00	$ 6,000.00	$ 70,000.00	$ 70,000.00
350 - 5	Remove Concrete Headwall & Apron	EA	1	$ 4,000.00	$ 4,000.00	$ 2,102.00	$ 2,102.00	$ 4,000.00	$ 4,000.00	$ 5,000.00	$ 5,000.00	$ 15,000.00	$ 15,000.00
350 - 6	Remove Slotted Drain	EA	1	$ 5,000.00	$ 5,000.00	$ 923.00	$ 923.00	$ 2,000.00	$ 2,000.00	$ 1,200.00	$ 1,200.00	$ 5,000.00	$ 5,000.00
350 - 7	Remove 60 Inch Concrete Pipe	LF	30	$ 65.00	$ 1,950.00	$ 125.00	$ 3,750.00	$ 70.00	$ 2,100.00	$ 255.00	$ 7,650.00	$ 300.00	$ 9,000.00
350 - 8	Remove 24 Inch and/or Smaller Concrete Pipe	LF	16	$ 45.00	$ 720.00	$ 29.00	$ 464.00	$ 52.00	$ 832.00	$ 80.00	$ 1,280.00	$ 50.00	$ 800.00
350 - 9	Remove Grouted RipRap	SY	355	$ 35.00	$ 12,425.00	$ 5.00	$ 1,775.00	$ 12.00	$ 4,260.00	$ 25.00	$ 8,875.00	$ 3.00	$ 1,065.00
401 - 1	Traffic Control	LS	1	$ 15,000.00	$ 15,000.00	$ 179,500.00	$ 179,500.00	$ 46,500.00	$ 46,500.00	$ 75,000.00	$ 75,000.00	$ 40,000.00	$ 40,000.00
405 - 1	Survey Monument, MAG Std DET 120-1, Type B	EA	1	$ 200.00	$ 200.00	$ 320.00	$ 320.00	$ 125.00	$ 125.00	$ 250.00	$ 250.00	$ 350.00	$ 350.00
420 - 1	5' Chain Link Fence (Allowance Item)	LF	90	$ 15.00	$ 1,350.00	$ 21.00	$ 1,890.00	$ 25.00	$ 2,250.00	$ 25.00	$ 2,250.00	$ 30.00	$ 2,700.00
430 - 1	Decomposed Granite, 1/4" minus	Ton	70	$ 22.00	$ 1,540.00	$ 67.00	$ 4,690.00	$ 80.00	$ 5,600.00	$ 110.00	$ 7,700.00	$ 80.00	$ 5,600.00
505 - 1	Concrete Junction Structure, Detail D3	EA	1	$ 30,000.00	$ 30,000.00	$ 35,500.00	$ 35,500.00	$ 52,000.00	$ 52,000.00	$ 45,000.00	$ 45,000.00	$ 65,000.00	$ 65,000.00
505 - 2	Concrete Catch Basin & Apron, MAG Std Detail 535-F & Dtl 2	EA	1	$ 5,000.00	$ 5,000.00	$ 2,024.00	$ 2,024.00	$ 11,000.00	$ 11,000.00	$ 8,600.00	$ 8,600.00	$ 45,000.00	$ 45,000.00
505 - 3	Concrete Drop Inlet Str, Detail 1	EA	1	$ 30,000.00	$ 30,000.00	$ 34,302.00	$ 34,302.00	$ 47,000.00	$ 47,000.00	$ 39,000.00	$ 39,000.00	$ 60,000.00	$ 60,000.00
505 - 4	Concrete Outlet Headwall, ADOT DET B-04.1(4:1), B06.10	EA	1	$ 8,000.00	$ 8,000.00	$ 33,905.00	$ 33,905.00	$ 40,000.00	$ 40,000.00	$ 21,000.00	$ 21,000.00	$ 40,000.00	$ 40,000.00
505 - 5	Concrete Spillway Cap	LF	776	$ 30.00	$ 23,280.00	$ 135.00	$ 104,760.00	$ 63.00	$ 48,888.00	$ 96.00	$ 74,496.00	$ 100.00	$ 77,600.00
505 - 6	Concrete Retaining Wall, H=5'	LF	28	$ 145.00	$ 4,060.00	$ 284.00	$ 7,952.00	$ 305.00	$ 8,540.00	$ 375.00	$ 10,500.00	$ 400.00	$ 11,200.00
505 - 7	Concrete Channel Lining	CY	15	$ 350.00	$ 5,250.00	$ 568.00	$ 8,520.00	$ 625.00	$ 9,375.00	$ 640.00	$ 9,600.00	$ 800.00	$ 12,000.00
510 - 1	6' Block Masonry Wall	LF	50	$ 22.00	$ 1,100.00	$ 71.00	$ 3,550.00	$ 185.00	$ 9,250.00	$ 210.00	$ 10,500.00	$ 60.00	$ 3,000.00
510 - 2	3' Block Masonry Wall (Allowance Item)	LF	100	$ 14.00	$ 1,400.00	$ 57.00	$ 5,700.00	$ 110.00	$ 11,000.00	$ 125.00	$ 12,500.00	$ 55.00	$ 5,500.00
515 - 1	Removable Bollards, Detail D4	EA	6	$ 200.00	$ 1,200.00	$ 142.00	$ 852.00	$ 750.00	$ 4,500.00	$ 450.00	$ 2,700.00	$ 600.00	$ 3,600.00
610 - 1	4" Waterline Vertical Realignment, COS Std Detail 2370	EA	1	$ 1,300.00	$ 1,300.00	$ 5,680.00	$ 5,680.00	$ 10,000.00	$ 10,000.00	$ 12,000.00	$ 12,000.00	$ 6,000.00	$ 6,000.00
610 - 2	6" Waterline Vertical Realignment, COS Std Detail 2370	EA	5	$ 1,600.00	$ 8,000.00	$ 9,940.00	$ 49,700.00	$ 10,500.00	$ 52,500.00	$ 12,500.00	$ 62,500.00	$ 6,500.00	$ 32,500.00
610 - 3	4" DIP Waterline Replacement	EA	1	$ 900.00	$ 900.00	$ 852.00	$ 852.00	$ 4,000.00	$ 4,000.00	$ 4,000.00	$ 4,000.00	$ 1,000.00	$ 1,000.00
610 - 4	4" Water Valve Box & Cover (Allowance Item)	EA	2	$ 1,000.00	$ 2,000.00	$ 426.00	$ 852.00	$ 1,000.00	$ 2,000.00	$ 1,600.00	$ 3,200.00	$ 1,000.00	$ 2,000.00
610 - 5	6" Water Valve Box & Cover (Allowance Item)	EA	2	$ 1,400.00	$ 2,800.00	$ 639.00	$ 1,278.00	$ 1,000.00	$ 2,000.00	$ 1,750.00	$ 3,500.00	$ 1,000.00	$ 2,000.00
618 - 1	84 Inch Pipe	LF	1,867	$ 450.00	$ 840,150.00	$ 180.00	$ 336,060.00	$ 370.00	$ 690,790.00	$ 388.00	$ 724,396.00	$ 525.00	$ 980,175.00
618 - 2	60 Inch Pipe	LF	12	$ 250.00	$ 3,000.00	$ 704.00	$ 8,448.00	$ 550.00	$ 6,600.00	$ 1,700.00	$ 20,400.00	$ 300.00	$ 3,600.00
618 - 3	24 Inch Pipe	LF	18	$ 125.00	$ 2,250.00	$ 142.00	$ 2,556.00	$ 300.00	$ 5,400.00	$ 290.00	$ 5,220.00	$ 150.00	$ 2,700.00
620 - 1	78 Inch Cast-In-Place Pipe	LF	658	$ 400.00	$ 263,200.00	$ 130.00	$ 85,540.00	$ 275.00	$ 180,950.00	$ 366.00	$ 240,828.00	$ 500.00	$ 329,000.00
625 - 1	Storm Drain Manhole, MAG Std Detail 521 & 522	EA	3	$ 5,000.00	$ 15,000.00	$ 2,840.00	$ 8,520.00	$ 9,000.00	$ 27,000.00	$ 6,500.00	$ 19,500.00	$ 5,000.00	$ 15,000.00
				TOTAL DOLLARS	$ 1,779,124.50		$ 1,299,107.00		$ 1,832,751.00		$ 2,019,637.25		$ 2,550,082.00
				DIFFERENCE IN DOLLARS FROM ENGINEER'S ESTIMATE			$ (480,017.50)		$ 53,626.50		$ 240,512.75		$ 770,957.50
				DIFFERENCE IN DOLLARS FROM LOW BID					$ 533,644.00		$ 720,530.25		$ 1,250,975.00

BID TAB

Contract FCD 2004C021, Bethany Home Outfall Channel - Reach 2B - 73rd Avenue to 67th Avenue

Bid Opening: February 2, 2005

				ENGNEER's ESTIMATE		Archon, Inc. 1200 West San Pedro St. Gilbert AZ 85233		C.S.&W. Contractors 6135 N. 7th Street #105 Phoenix AZ 85014	
ITEM #	DESCRIPTION	UNIT	QTY	UNIT PRICE	BID TOTAL	UNIT PRICE	BID TOTAL	UNIT PRICE	BID TOTAL
105 1	Partnering Allowance	LS	1	$15,000.00	$ 15,000.00	$ 15,000.00	$ 15,000.00	$ 15,000.00	$ 15,000.00
107 1	AZPDES/SWPPP Permits	LS	1	$ 5,000.00	$ 5,000.00	$ 500.00	$ 500.00	$ 9,817.83	$ 9,817.83
107 2	Public Information and Notification (Allowance)	LS	1	$ 20,000.00	$ 20,000.00	$ 20,000.00	$ 20,000.00	$ 20,000.00	$ 20,000.00
107 3	Project Signs Allowance	LS	1	$5,000.00	$ 5,000.00	$ 5,000.00	$ 5,000.00	$ 5,000.00	$ 5,000.00
202 1	Mobilization	LS	1	$ 101,178.00	$ 101,178.00	$ 100,000.00	$ 100,000.00	$ 94,986.38	$ 94,986.38
215 1	Drainage Excavation	CY	184,805	$ 4.25	$ 785,421.25	$ 6.85	$ 1,265,914.25	$ 9.22	$ 1,703,902.10
221 1	Spillway Erosion Protection	SY	3,375	$ 75.00	$ 253,125.00	$ 115.00	$ 388,125.00	$ 32.76	$ 110,565.00
336 1	Pavement Replacement	SY	1,498	$ 22.00	$ 32,956.00	$ 15.00	$ 22,470.00	$ 17.33	$ 25,960.34
336 2	Pavement Replacement (Allowance)	SY	3,300	$ 22.00	$ 72,600.00	$ 16.00	$ 52,800.00	$ 15.54	$ 51,282.00
340 1	Concrete Sidewalk	SF	3,944	$ 2.50	$ 9,860.00	$ 4.00	$ 15,776.00	$ 2.82	$ 11,122.08
340 2	Concrete Sidewalk (Allowance)	SF	9,900	$ 2.50	$ 24,750.00	$ 3.00	$ 29,700.00	$ 2.37	$ 23,463.00
340 3	Concrete Curb ad Gutter (MAG Detail 220, Type A)	LF	303	$ 10.00	$ 3,030.00	$ 15.00	$ 4,545.00	$ 15.26	$ 4,623.78
340 4	Concrete Curb ad Gutter (MAG Detail 220, Type B)	LF	40	$ 9.00	$ 360.00	$ 15.00	$ 600.00	$ 14.35	$ 574.00
340 5	Concrete Curb ad Gutter (MAG Detail 220, Type C)	LF	215	$ 9.00	$ 1,935.00	$ 12.00	$ 2,580.00	$ 12.33	$ 2,650.95
340 6	Concrete Valley Gutter (MAG Detail 240)	LF	397	$ 8.00	$ 3,176.00	$ 12.00	$ 4,764.00	$ 21.23	$ 8,428.31
340 7	Concrete Curb and Gutter Transition 8' Length	EA	5	$ 160.00	$ 800.00	$ 150.00	$ 750.00	$ 112.90	$ 564.50
340 8	Concrete Curb and Gutter Transition 6' Length	EA	13	$ 120.00	$ 1,560.00	$ 150.00	$ 1,950.00	$ 82.09	$ 1,067.17
340 9	Concrete Curb and Gutter Transition 5' Length	EA	1	$ 100.00	$ 100.00	$ 300.00	$ 300.00	$ 68.41	$ 68.41
340 10	Concrete Sidewalk Ramp (C.O.P. Detail P1236)	EA	1	$ 800.00	$ 800.00	$ 2,000.00	$ 2,000.00	$ 419.01	$ 419.01
340 11	Concrete Sidewalk Ramp (C.O.P. Detail P1244, W=10')	EA	4	$ 800.00	$ 3,200.00	$ 2,500.00	$ 10,000.00	$ 1,058.20	$ 4,232.80
340 12	Concrete Curb and Gutter (ALLOWANCE)	LF	2,475	$ 9.00	$ 22,275.00	$ 9.00	$ 22,275.00	$ 9.12	$ 22,572.00
340 13	Concrete Pedestrian Trail (Primary)	SF	49,894	$ 5.00	$ 249,470.00	$ 5.00	$ 249,470.00	$ 3.62	$ 180,616.28
340 14	Concrete Pedestrian Trail (Secondary)	SF	6,147	$ 7.00	$ 43,029.00	$ 9.00	$ 55,323.00	$ 8.99	$ 55,261.53
345 1	Adjust Manhole Frame and Cover	EA	2	$ 320.00	$ 640.00	$ 300.00	$ 600.00	$ 295.86	$ 591.72
350 1	Remove Asphalt Concrete Pavement	SY	3,018	$ 2.50	$ 7,545.00	$ 4.00	$ 12,072.00	$ 2.22	$ 6,699.96
350 2	Remove Concrete Curb and Gutter	LF	1,745	$ 4.00	$ 6,980.00	$ 3.00	$ 5,235.00	$ 1.92	$ 3,350.40
350 3	Remove Concrete Sidewalk	SF	5,591	$ 1.20	$ 6,709.20	$ 1.00	$ 5,591.00	$ 0.53	$ 2,963.23
350 4	Remove Concrete Channel Lining	SY	4,675	$ 5.00	$ 23,375.00	$ 5.00	$ 23,375.00	$ 4.02	$ 18,793.50
350 5	Remove Existing Water Pipe	LF	830	$ 10.00	$ 8,300.00	$ 15.00	$ 12,450.00	$ 10.20	$ 8,466.00
350 6	Remove Existing Sewer Pipe	LF	6,307	$ 14.00	$ 88,298.00	$ 15.00	$ 94,605.00	$ 9.69	$ 61,114.83
350 7	Miscellaneous Removal of Existing Improvements	LS	1	$ 35,000.00	$ 35,000.00	$ 100,000.00	$ 100,000.00	$ 9,099.36	$ 9,099.36
401 1	Traffic Control	LS	1	$ 30,000.00	$ 30,000.00	$ 10,000.00	$ 10,000.00	$ 16,326.70	$ 16,326.70
405 1	Survey Monument (MAG Detail 120-1 Type "B")	EA	3	$ 300.00	$ 900.00	$ 100.00	$ 300.00	$ 119.60	$ 358.80
430 1	Trees (24" Box)	EA	290	$ 225.00	$ 65,250.00	$ 150.00	$ 43,500.00	$ 175.00	$ 50,750.00
430 2	Trees (15 Gallon)	EA	300	$ 73.00	$ 21,900.00	$ 80.00	$ 24,000.00	$ 71.76	$ 21,528.00
430 3	Boulders	EA	155	$ 150.00	$ 23,250.00	$ 80.00	$ 12,400.00	$ 75.54	$ 11,708.70
430 4	Turf (Hydroseed)	SF	336,885	$ 0.12	$ 40,426.20	$ 0.06	$ 20,213.10	$ 0.13	$ 43,795.05
430 5	Decomposed Granite	SF	334,648	$ 0.30	$ 100,394.40	$ 0.27	$ 90,354.96	$ 0.30	$ 100,394.40

BID TAB

Contract FCD 2004C021, Bethany Home Outfall Channel - Reach 2B - 73rd Avenue to 67th Avenue

Bid Opening: February 2, 2005

				ENGNEER's ESTIMATE		Archon, Inc. 1200 West San Pedro St. Gilbert AZ 85233		C.S.&W. Contractors 6135 N. 7th Street #105 Phoenix AZ 85014	
ITEM #	DESCRIPTION	UNIT	QTY	UNIT PRICE	BID TOTAL	UNIT PRICE	BID TOTAL	UNIT PRICE	BID TOTAL
430 6	Concrete Header	LF	2,218	$ 8.00	$ 17,744.00	$ 7.00	$ 15,526.00	$ 8.53	$ 18,919.54
430 7	Hardscape Elements	LS	1	$ 5,600.00	$ 5,600.00	$ 20,000.00	$ 20,000.00	$ 10,778.14	$ 10,778.14
430 8	Site Amenities	LS	1	$ 11,400.00	$ 11,400.00	$ 20,000.00	$ 20,000.00	$ 11,840.07	$ 11,840.07
430 9	4" Stabilized Decomposed Granite	SF	970	$ 1.50	$ 1,455.00	$ 2.00	$ 1,940.00	$ 1.45	$ 1,406.50
440 1	Irrigation Distribution System	LS	1	$ 369,600.00	$ 369,600.00	$ 200,000.00	$ 200,000.00	$ 234,364.19	$ 234,364.19
440 2	Irrigation Control System	LS	1	$ 80,000.00	$ 80,000.00	$ 50,000.00	$ 50,000.00	$ 62,105.75	$ 62,105.75
505 1	RCBC 1, 71st Avenue (3-10'x8')	LS	1	$ 160,200.00	$ 160,200.00	$ 250,136.00	$ 250,136.00	$ 198,864.06	$ 198,864.06
505 2	Concrete Low-Flow Channel (Detail D4)	LF	4,861	$ 37.00	$ 179,857.00	$ 40.00	$ 194,440.00	$ 60.93	$ 296,180.73
505 3	Low-Flow Channel Crossing (Detail D2)	EA	2	$ 5,800.00	$ 11,600.00	$ 6,500.00	$ 13,000.00	$ 3,386.27	$ 6,772.54
505 4	Headwall (18"), (Detail D6 and D10)	EA	7	$ 2,500.00	$ 17,500.00	$ 3,000.00	$ 21,000.00	$ 2,342.79	$ 16,399.53
505 5	Concrete Painting	LS	1	$ 1,800.00	$ 1,800.00	$ 12,000.00	$ 12,000.00	$ 8,208.12	$ 8,208.12
505 6	Catch Basins (Detail D3)	EA	7	$ 2,300.00	$ 16,100.00	$ 2,500.00	$ 17,500.00	$ 2,138.20	$ 14,967.40
505 7	Headwall (24"), MAG Detail 501-1, Type U	EA	1	$ 2,800.00	$ 2,800.00	$ 3,000.00	$ 3,000.00	$ 2,311.21	$ 2,311.21
505 8	Headwall (48") , MAG Detail 501-3	EA	1	$ 4,300.00	$ 4,300.00	$ 4,000.00	$ 4,000.00	$ 4,254.28	$ 4,254.28
505 9	Retaining Wall (Detail 11)	CY	25	$ 700.00	$ 17,500.00	$ 1,300.00	$ 32,500.00	$ 1,142.75	$ 28,568.75
610 1	4" CIP Water Line Relocation	LF	10	$ 75.00	$ 750.00	$ 70.00	$ 700.00	$ 116.77	$ 1,167.70
610 2	6" ACP Water Line Relocation	LF	370	$ 100.00	$ 37,000.00	$ 45.00	$ 16,650.00	$ 63.09	$ 23,343.30
610 3	8" ACP Water Line Relocation	LF	530	$ 120.00	$ 63,600.00	$ 55.00	$ 29,150.00	$ 67.00	$ 35,510.00
615 1	Vitrified Clay Pipe (8")	LF	3,376	$ 55.00	$ 185,680.00	$ 80.00	$ 270,080.00	$ 74.53	$ 251,613.28
615 2	Vitrified Clay Pipe (10")	LF	118	$ 65.00	$ 7,670.00	$ 65.00	$ 7,670.00	$ 151.23	$ 17,845.14
615 3	Lined Ductile Iron Pipe (10")	LF	108	$ 80.00	$ 8,640.00	$ 80.00	$ 8,640.00	$ 190.04	$ 20,524.32
618 1	24-Inch RGRCP, Class III	LF	23	$ 75.00	$ 1,725.00	$ 80.00	$ 1,840.00	$ 92.64	$ 2,130.72
618 2	48-Inch RGRCP, Class III	LF	136	$ 120.00	$ 16,320.00	$ 160.00	$ 21,760.00	$ 194.28	$ 26,422.08
619 1	Drywell	EA	1	$ 12,000.00	$ 12,000.00	$ 12,000.00	$ 12,000.00	$ 15,107.52	$ 15,107.52
621 1	Pipe, Corrugated Metal (18")	LF	259	$ 40.00	$ 10,360.00	$ 70.00	$ 18,130.00	$ 63.68	$ 16,493.12
625 1	Drop Sewer Connection 8" Diameter, MAG DTL 426	EA	2	$ 4,000.00	$ 8,000.00	$ 900.00	$ 1,800.00	$ 2,348.34	$ 4,696.68
625 2	Sanitary Sewer Manhole 4' Diameter, COP DTL P1430	EA	10	$ 4,500.00	$ 45,000.00	$ 3,000.00	$ 30,000.00	$ 2,924.74	$ 29,247.40
625 3	Sanitary Sewer Manhole 5' Diameter, COP DTL P1430	EA	11	$ 6,000.00	$ 66,000.00	$ 4,000.00	$ 44,000.00	$ 2,200.84	$ 24,209.24
				TOTAL DOLLARS	$ 3,473,794.05		$ 4,042,000.31		$ 4,092,369.43
				DIFFERENCE IN DOLLARS FROM ENGINEER'S ESTIMATE			$ 568,206.26		$ 618,575.38
				DIFFERENCE IN DOLLARS FROM LOW BID					$ 50,369.12

BID TAB

Contract FCD 2004C021, Bethany Home Outfall Channel - Reach 2B - 73rd Avenue to 67th Avenue

Bid Opening: February 2, 2005

ITEM #	DESCRIPTION	UNIT	QTY	ENGNEER's ESTIMATE UNIT PRICE	ENGNEER's ESTIMATE BID TOTAL	
105 - 1	Partnering Allowance	LS	1	$15,000.00	$ 15,000.00	
107 - 1	AZPDES/SWPPP Permits	LS	1	$ 5,000.00	$ 5,000.00	
107 - 2	Public Information and Notification (Allowance)	LS	1	$ 20,000.00	$ 20,000.00	
107 - 3	Project Signs Allowance	LS	1	$5,000.00	$ 5,000.00	
202 - 1	Mobilization	LS	1	$ 101,178.00	$ 101,178.00	
215 - 1	Drainage Excavation	CY	184,805	$ 4.25	$ 785,421.25	
221 - 1	Spillway Erosion Protection	SY	3,375	$ 75.00	$ 253,125.00	
336 - 1	Pavement Replacement	SY	1,498	$ 22.00	$ 32,956.00	
336 - 2	Pavement Replacement (Allowance)	SY	3,300	$ 22.00	$ 72,600.00	
340 - 1	Concrete Sidewalk	SF	3,944	$ 2.50	$ 9,860.00	
340 - 2	Concrete Sidewalk (Allowance)	SF	9,900	$ 2.50	$ 24,750.00	
340 - 3	Concrete Curb ad Gutter (MAG Detail 220, Type A)	LF	303	$ 10.00	$ 3,030.00	
340 - 4	Concrete Curb ad Gutter (MAG Detail 220, Type B)	LF	40	$ 9.00	$ 360.00	
340 - 5	Concrete Curb ad Gutter (MAG Detail 220, Type C)	LF	215	$ 9.00	$ 1,935.00	
340 - 6	Concrete Valley Gutter (MAG Detail 240)	LF	397	$ 8.00	$ 3,176.00	
340 - 7	Concrete Curb and Gutter Transition 8' Length	EA	5	$ 160.00	$ 800.00	
340 - 8	Concrete Curb and Gutter Transition 6' Length	EA	13	$ 120.00	$ 1,560.00	
340 - 9	Concrete Curb and Gutter Transition 5' Length	EA	1	$ 100.00	$ 100.00	
340 - 10	Concrete Sidewalk Ramp (C.O.P. Detail P1236)	EA	1	$ 800.00	$ 800.00	
340 - 11	Concrete Sidewalk Ramp (C.O.P. Detail P1244, W=10')	EA	4	$ 800.00	$ 3,200.00	
340 - 12	Concrete Curb and Gutter (ALLOWANCE)	LF	2,475	$ 9.00	$ 22,275.00	
340 - 13	Concrete Pedestrian Trail (Primary)	SF	49,894	$ 5.00	$ 249,470.00	
340 - 14	Concrete Pedestrian Trail (Secondary)	SF	6,147	$ 7.00	$ 43,029.00	
345 - 1	Adjust Manhole Frame and Cover	EA	2	$ 320.00	$ 640.00	
350 - 1	Remove Asphalt Concrete Pavement	SY	3,018	$ 2.50	$ 7,545.00	
350 - 2	Remove Concrete Curb and Gutter	LF	1,745	$ 4.00	$ 6,980.00	
350 - 3	Remove Concrete Sidewalk	SF	5,591	$ 1.20	$ 6,709.20	
350 - 4	Remove Concrete Channel Lining	SY	4,675	$ 5.00	$ 23,375.00	
350 - 5	Remove Existing Water Pipe	LF	830	$ 10.00	$ 8,300.00	
350 - 6	Remove Existing Sewer Pipe	LF	6,307	$ 14.00	$ 88,298.00	
350 - 7	Miscellaneous Removal of Existing Improvements	LS	1	$ 35,000.00	$ 35,000.00	
401 - 1	Traffic Control	LS	1	$ 30,000.00	$ 30,000.00	
405 - 1	Survey Monument (MAG Detail 120-1 Type "B")	EA	3	$ 300.00	$ 900.00	
430 - 1	Trees (24" Box)	EA	290	$ 225.00	$ 65,250.00	
430 - 2	Trees (15 Gallon)	EA	300	$ 73.00	$ 21,900.00	
430 - 3	Boulders	EA	155	$ 150.00	$ 23,250.00	
430 - 4	Turf (Hydroseed)	SF	336,885	$ 0.12	$ 40,426.20	
430 - 5	Decomposed Granite	SF	334,648	$ 0.30	$ 100,394.40	

BID TAB

Contract FCD 2004C021, Bethany Home Outfall Channel - Reach 2B - 73rd Avenue to 67th Avenue

Bid Opening: February 2, 2005

ITEM #	DESCRIPTION	UNIT	QTY	ENGNEER's ESTIMATE UNIT PRICE	ENGNEER's ESTIMATE BID TOTAL	
430 6	Concrete Header	LF	2,218	$ 8.00	$ 17,744.00	
430 7	Hardscape Elements	LS	1	$ 5,600.00	$ 5,600.00	
430 8	Site Amenities	LS	1	$ 11,400.00	$ 11,400.00	
430 9	4" Stabilized Decomposed Granite	SF	970	$ 1.50	$ 1,455.00	
440 1	Irrigation Distribution System	LS	1	$ 369,600.00	$ 369,600.00	
440 2	Irrigation Control System	LS	1	$ 80,000.00	$ 80,000.00	
505 1	RCBC 1, 71st Avenue (3-10'x8')	LS	1	$ 160,200.00	$ 160,200.00	
505 2	Concrete Low-Flow Channel (Detail D4)	LF	4,861	$ 37.00	$ 179,857.00	
505 3	Low-Flow Channel Crossing (Detail D2)	EA	2	$ 5,800.00	$ 11,600.00	
505 4	Headwall (18"), (Detail D6 and D10)	EA	7	$ 2,500.00	$ 17,500.00	
505 5	Concrete Painting	LS	1	$ 1,800.00	$ 1,800.00	
505 6	Catch Basins (Detail D3)	EA	7	$ 2,300.00	$ 16,100.00	
505 7	Headwall (24"), MAG Detail 501-1, Type U	EA	1	$ 2,800.00	$ 2,800.00	
505 8	Headwall (48") , MAG Detail 501-3	EA	1	$ 4,300.00	$ 4,300.00	
505 9	Retaining Wall (Detail 11)	CY	25	$ 700.00	$ 17,500.00	
610 1	4" CIP Water Line Relocation	LF	10	$ 75.00	$ 750.00	
610 2	6" ACP Water Line Relocation	LF	370	$ 100.00	$ 37,000.00	
610 3	8" ACP Water Line Relocation	LF	530	$ 120.00	$ 63,600.00	
615 1	Vitrified Clay Pipe (8")	LF	3,376	$ 55.00	$ 185,680.00	
615 2	Vitrified Clay Pipe (10")	LF	118	$ 65.00	$ 7,670.00	
615 3	Lined Ductile Iron Pipe (10")	LF	108	$ 80.00	$ 8,640.00	
618 1	24-Inch RGRCP, Class III	LF	23	$ 75.00	$ 1,725.00	
618 2	48-Inch RGRCP, Class III	LF	136	$ 120.00	$ 16,320.00	
619 1	Drywell	EA	1	$ 12,000.00	$ 12,000.00	
621 1	Pipe, Corrugated Metal (18")	LF	259	$ 40.00	$ 10,360.00	
625 1	Drop Sewer Connection 8" Diameter, MAG DTL 426	EA	2	$ 4,000.00	$ 8,000.00	
625 2	Sanitary Sewer Manhole 4' Diameter, COP DTL P1430	EA	10	$ 4,500.00	$ 45,000.00	
625 3	Sanitary Sewer Manhole 5' Diameter, COP DTL P1430	EA	11	$ 6,000.00	$ 66,000.00	
				TOTAL DOLLARS	$ 3,473,794.05	
				DIFFERENCE IN DOLLARS FROM ENGINEER'S ESTIMATE		
				DIFFERENCE IN DOLLARS FROM LOW BID		

BID TABULATION

Project No. WS85500268-1

Description: 27th Ave/Roosevelt/31st Ave/Van Buren-1

Item No.	Description	Unit	Quantity	Engineer's Unit Price	WGC, Inc.	PIERSON CONSTRUCTI CORPORATIO	J Wise Corp	TALIS CONSTRUCTIO	B & F Contracting, Inc.
22 M6104006	6" Ductile Iron Water Pipe & Fittings, Restrained, Furnish & Install	L. F.	1,254.00	60.00	46.00	61.00	69.90	62.34	65.00
23 M6104008	8" Ductile Iron Water Pipe & Fittings, Restrained, Furnish & Install	L. F.	44.00	65.00	56.00	75.00	80.70	83.78	75.00
24 M6104012	12" Ductile Iron Water Pipe & Fittings, Restrained, Furnish & Install	L. F.	479.00	85.00	76.00	95.00	83.50	113.19	110.00
25 M6104301	Cutting and Plugging Existing Water Line, Up To & Incl. 12"	Each	64.00	800.00	1,300.00	1,600.00	900.00	1,381.96	1,500.00
26 M6104400	Waterline Cut-Out, Std. Detail P-1344	Each	35.00	1,100.00	1,300.00	1,750.00	1,500.00	2,730.32	1,600.00
27 M6106002	Remove Existing Valve Box & Cover, Restore Surface	Each	86.00	200.00	100.00	135.00	125.00	131.91	140.00
28 M6108006	Fire Hydrant Furnished by the City of Phoenix, Install	Each	26.00	800.00	908.00	950.00	950.00	1,086.81	725.00
29 M6108007	Fire Hydrant, Salvage & Deliver to the City of Phoenix	Each	8.00	400.00	200.00	450.00	300.00	150.24	330.00
30 M6153000	Construct Water or Sanitary Sewer Encasement, MAG. St'd. Detail-404	Lin. Ft.	160.00	85.00	50.00	65.00	70.00	66.03	50.00
31 M6303006	6" Valve, Box and Cover, Furnish & Install	Each	9.00	700.00	960.00	1,000.00	900.00	801.06	950.00
32 M6303008	8" Valve, Box and Cover, Furnish & Install	Each	2.00	800.00	1,300.00	1,300.00	1,100.00	1,123.27	1,100.00

Contract FCD 99-04
43rd Avenue Storm Drain

BID TAB

Bid Opening June 16, 1999

				Engineer's Estimate		Ames Construction		PCL Civil		Archon	
Item No.	QTY.	Unit	Qty	Unit Price	Bid Total	Unit Price	Bid Total	Unit Price	Bid Total	Unit Price	Bid Total
105 - 1	Partnering	LS	1	15,000.00	15,000.00	15,000.00	15,000.00	15,000.00	15,000.00	15,000.00	15,000.00
107 - 1	NPDES / SWPPP Permits	LS	1	20,000.00	20,000.00	4,000.00	4,000.00	12,500.00	12,500.00	20,000.00	20,000.00
107 - 2	Public Information and Notification Allowance	LS	1	25,000.00	25,000.00	25,000.00	25,000.00	25,000.00	25,000.00	25,000.00	25,000.00
107 - 3	Project Signs Allowance	LS	1	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00
202 - 1	Mobilization	LS	1	205,000.00	205,000.00	166,000.00	166,000.00	163,285.00	163,285.00	172,000.00	172,000.00
336 - 1	Pavement Replacement (4"AC/8"ABC)	SY	13,145	21.50	282,617.50	10.50	138,022.50	12.00	157,740.00	9.50	124,877.50
336 - 2	Pavement Replacement (4"AC/10"ABC)	SY	19,251	22.00	423,522.00	10.75	206,948.25	12.50	240,637.50	10.00	192,510.00
340 - 1	Curb and Gutter, MAG DET 220, Type A	LF	242	5.75	1,391.50	10.00	2,420.00	11.00	2,662.00	20.00	4,840.00
340 - 2	Sidewalk, MAG DET 230	SF	902	3.00	2,706.00	3.00	2,706.00	6.00	5,412.00	4.00	3,608.00
345 - 1	Adjust Manhole Frame and Cover	EA	13	1,150.00	14,950.00	350.00	4,550.00	360.00	4,680.00	350.00	4,550.00
345 - 2	Adjust Water Valve Box and Cover, Type A	EA	5	1,150.00	5,750.00	250.00	1,250.00	200.00	1,000.00	400.00	2,000.00
350 - 1	Removal of Existing Improvements	LS	1	11,500.00	11,500.00	50,000.00	50,000.00	30,000.00	30,000.00	330,000.00	330,000.00
401 - 1	Traffic Control	LS	1	150,000.00	150,000.00	68,000.00	68,000.00	30,000.00	30,000.00	75,000.00	75,000.00
405 - 1	Survey Monument MAG DET 120-1, Type A	EA	3	400.00	1,200.00	200.00	600.00	300.00	900.00	400.00	1,200.00
405 - 2	Survey Monument MAG DET 120-1, Type B	EA	7	230.00	1,610.00	200.00	1,400.00	200.00	1,400.00	300.00	2,100.00
420 - 1	24' Chain Link Fence Gate	EA	1	575.00	575.00	1,000.00	1,000.00	2,000.00	2,000.00	1,200.00	1,200.00
505 - 1	Special Junction Structure	EA	1	28,750.00	28,750.00	14,000.00	14,000.00	42,000.00	42,000.00	16,000.00	16,000.00
505 - 2	Concrete Headwall	EA	1	4,600.00	4,600.00	4,000.00	4,000.00	7,500.00	7,500.00	6,500.00	6,500.00
505 - 3	Concrete Box Culvert, ADOT Det B 02.10	LF	90	690.00	62,100.00	520.00	46,800.00	1,000.00	90,000.00	400.00	36,000.00
505 - 4	Concrete Catch Basin COP Det P 1569-1, M-1, L=10	EA	2	2,875.00	5,750.00	1,800.00	3,600.00	3,000.00	6,000.00	3,500.00	7,000.00
505 - 5	Concrete Catch Basin COP Det P 1569-1, M-1, L=17	EA	2	3,220.00	6,440.00	2,000.00	4,000.00	4,400.00	8,800.00	4,000.00	8,000.00
505 - 6	Concrete Catch Basin COP Det P 1569-1, M-2, L=6	EA	5	3,450.00	17,250.00	1,500.00	7,500.00	4,000.00	20,000.00	4,700.00	23,500.00
505 - 7	Concrete Catch Basin COP Det P 1569-1, M-2, L=10	EA	6	4,025.00	24,150.00	1,700.00	10,200.00	4,300.00	25,800.00	6,000.00	36,000.00
505 - 8	Concrete Catch Basin COP Det P 1569-1, M-2, L=17	EA	9	5,175.00	46,575.00	2,300.00	20,700.00	4,800.00	43,200.00	7,900.00	71,100.00
505 - 9	Concrete Catch Basin COP Det P 1570, N-Double	EA	1	3,450.00	3,450.00	1,000.00	1,000.00	3,100.00	3,100.00	3,900.00	3,900.00
515 - 1	10' x 5' Flap Gate	EA	1	17,250.00	17,250.00	25,000.00	25,000.00	23,000.00	23,000.00	36,000.00	36,000.00
601 - 1	Permanent Pipe Supports, MAG Det 403-3	EA	3	1,150.00	3,450.00	1,200.00	3,600.00	1,900.00	5,700.00	1,900.00	5,700.00
610 - 1	12" Ductile Iron Water Pipe and Fittings	LF	151	52.00	7,852.00	87.00	13,137.00	72.00	10,872.00	55.00	8,305.00
610 - 2	Replace Water Service Pipe (Contingent Bid Item)	LF	60	5.75	345.00	5.50	330.00	82.00	4,920.00	80.00	4,800.00

Contract FCD 99-04
43rd Avenue Storm Drain

BID TAB

Bid Opening June 16, 1999

				Engineer's Estimate		Ames Construction		PCL Civil		Archon	
Item No.	QTY.	Unit	Qty	Unit Price	Bid Total	Unit Price	Bid Total	Unit Price	Bid Total	Unit Price	Bid Total
610 - 3	Relocate Water Meter (Contingent Bid Item)	EA	1	230.00	230.00	270.00	270.00	4,900.00	4,900.00	5,300.00	5,300.00
618 - 1	114 Inch Pipe, Class III RGRCP OR 621-1, 114 Inch CLCMP 1	LF	4,420	525.00	2,320,500.00	408.00	1,803,360.00	401.00	1,772,420.00	450.00	1,989,000.00
618 - 2	114 Inch Pipe, Class IV RGRCP OR 621-1, 114 Inch CLCMP 1	LF	2,682	525.00	1,408,050.00	410.00	1,099,620.00	383.00	1,027,206.00	450.00	1,206,900.00
618 - 3	96 Inch Pipe, Class III RGRCP OR 621-2, 96 Inch CLCMP 10	LF	60	340.00	20,400.00	280.00	16,800.00	469.00	28,140.00	380.00	22,800.00
618 - 4	84 Inch Pipe, Class III RGRCP OR 621-3, 84 Inch CLCMP 10	LF	60	250.00	15,000.00	240.00	14,400.00	419.00	25,140.00	350.00	21,000.00
618 - 5	72 Inch Pipe, Class III RGRCP OR 621-4, 72 Inch CLCMP 10	LF	720	200.00	144,000.00	200.00	144,000.00	199.00	143,280.00	260.00	187,200.00
618 - 6	72 Inch Pipe, Class IV RGRCP OR 621-4, 72 Inch CLCMP 10	LF	200	200.00	40,000.00	150.00	30,000.00	209.00	41,800.00	260.00	52,000.00
618 - 7	66 Inch Pipe, Class III RGRCP OR 621-5, 66 Inch CLCMP 12	LF	2,193	190.00	416,670.00	165.00	361,845.00	169.00	370,617.00	250.00	548,250.00
618 - 8	54 Inch Pipe, Class III RGRCP OR 621-6, 54 Inch CLCMP 14	LF	73	112.00	8,176.00	135.00	9,855.00	247.00	18,031.00	210.00	15,330.00
618 - 9	Bore & Jack 114 Inch Pipe	LF	170	4,000.00	680,000.00	3,000.00	510,000.00	3,483.00	592,110.00	3,000.00	510,000.00
618 - 10	Pipe Plug, MAG Det 427, 72 INCH	EA	2	2,750.00	5,500.00	1,300.00	2,600.00	900.00	1,800.00	1,800.00	3,600.00
618 - 11	Pipe Plug, MAG Det 427, 66 INCH	EA	2	2,750.00	5,500.00	1,000.00	2,000.00	900.00	1,800.00	1,600.00	3,200.00
618 - 12	Pipe Plug, MAG Det 427, 54 INCH	EA	1	1,725.00	1,725.00	810.00	810.00	800.00	800.00	1,300.00	1,300.00
618 - 13	Pipe Plug, MAG Det 427, 24 INCH	EA	2	1,725.00	3,450.00	325.00	650.00	700.00	1,400.00	350.00	700.00
618 - 14	15 Inch Catch Basin Connector Pipe, Class III	LF	78	80.00	6,240.00	60.00	4,680.00	275.00	21,450.00	100.00	7,800.00
618 - 15	15 Inch Catch Basin Connector Pipe, Class IV	LF	188	80.00	15,040.00	60.00	11,280.00	100.00	18,800.00	100.00	18,800.00
618 - 16	18 Inch Catch Basin Connector Pipe, Class III	LF	10	92.00	920.00	58.00	580.00	800.00	8,000.00	120.00	1,200.00
618 - 17	18 Inch Catch Basin Connector Pipe, Class IV	LF	126	92.00	11,592.00	58.00	7,308.00	110.00	13,860.00	120.00	15,120.00
618 - 18	24 Inch Catch Basin Connector Pipe, Class III	LF	103	125.00	12,875.00	87.00	8,961.00	270.00	27,810.00	140.00	14,420.00
618 - 19	24 Inch Catch Basin Connector Pipe, Class IV	LF	264	125.00	33,000.00	87.00	22,968.00	132.00	34,848.00	140.00	36,960.00
618 - 20	24 Inch Catch Basin Connector Pipe, Class V	LF	64	125.00	8,000.00	87.00	5,568.00	245.00	15,680.00	150.00	9,600.00
618 - 21	30 Inch Catch Basin Connector Pipe, Class III	LF	20	138.00	2,760.00	91.00	1,820.00	325.00	6,500.00	155.00	3,100.00
618 - 22	30 Inch Catch Basin Connector Pipe, Class IV	LF	62	138.00	8,556.00	91.00	5,642.00	123.00	7,626.00	155.00	9,610.00
618 - 23	30 Inch Catch Basin Connector Pipe, Class V	LF	59	138.00	8,142.00	91.00	5,369.00	180.00	10,620.00	155.00	9,145.00
618 - 24	72 Inch Catch Basin Connector Pipe, Class IV	LF	64	138.00	8,832.00	262.00	16,768.00	210.00	13,440.00	550.00	35,200.00
618 - 25	72 Inch To 84 Inch Pipe Transition	EA	1	11,500.00	11,500.00	1,620.00	1,620.00	2,000.00	2,000.00	1,200.00	1,200.00
618 - 26	84 Inch To 96 Inch Pipe Transition	EA	1	11,500.00	11,500.00	1,800.00	1,800.00	2,000.00	2,000.00	1,500.00	1,500.00
618 - 27	96 Inch To 114 Inch Pipe Transition	EA	1	11,500.00	11,500.00	2,160.00	2,160.00	2,000.00	2,000.00	1,800.00	1,800.00
618 - 28	114 Inch x 15 Inch Prefab Tee	EA	1	1,150.00	1,150.00	875.00	875.00	420.00	420.00	400.00	400.00

Contract FCD 99-04
43rd Avenue Storm Drain

BID TAB

Bid Opening June 16, 1999

				Engineer's Estimate		Ames Construction		PCL Civil		Archon	
Item No.	QTY.	Unit	Qty	Unit Price	Bid Total	Unit Price	Bid Total	Unit Price	Bid Total	Unit Price	Bid Total
618 - 29	114 Inch x 18 Inch Prefab Tee	EA	1	1,150.00	1,150.00	875.00	875.00	420.00	420.00	400.00	400.00
618 - 30	114 Inch x 24 Inch Prefab Tee	EA	4	1,150.00	4,600.00	875.00	3,500.00	420.00	1,680.00	400.00	1,600.00
618 - 31	114 Inch x 24 Inch Prefab Tangent Tee	EA	1	1,150.00	1,150.00	875.00	875.00	420.00	420.00	400.00	400.00
618 - 32	114 Inch x 30 Inch Prefab Tee	EA	1	1,150.00	1,150.00	875.00	875.00	420.00	420.00	400.00	400.00
618 - 33	114 Inch x 30 Inch Prefab Tangent Tee with trash rack	EA	1	2,300.00	2,300.00	1,500.00	1,500.00	420.00	420.00	800.00	800.00
618 - 34	114 Inch x 66 Inch Prefab Tee	EA	1	1,150.00	1,150.00	1,400.00	1,400.00	800.00	800.00	950.00	950.00
618 - 35	114 Inch x 72 Inch Prefab Tangent Tee	EA	1	1,150.00	1,150.00	1,600.00	1,600.00	960.00	960.00	1,200.00	1,200.00
618 - 36	66 Inch x 15 Inch Tee	EA	6	1,150.00	6,900.00	540.00	3,240.00	70.00	420.00	400.00	2,400.00
618 - 37	66 Inch x 18 Inch Tee	EA	2	1,150.00	2,300.00	540.00	1,080.00	200.00	400.00	500.00	1,000.00
618 - 38	66 Inch x 24 Inch Tee	EA	4	1,150.00	4,600.00	540.00	2,160.00	420.00	1,680.00	400.00	1,600.00
618 - 39	66 Inch x 30 Inch Tee	EA	1	1,150.00	1,150.00	540.00	540.00	420.00	420.00	400.00	400.00
618 - 40	Concrete Pipe Collar, MAG DET 505 (24" & Larger)	EA	1	1,150.00	1,150.00	2,200.00	2,200.00	750.00	750.00	1,400.00	1,400.00
618 - 41	Prefab 30 Degree Bend, 114 Inch Pipe	EA	2	1,380.00	2,760.00	2,200.00	4,400.00	1,500.00	3,000.00	1,800.00	3,600.00
618 - 42	Prefab 45 Degree Bend, 114 Inch Pipe	EA	1	1,380.00	1,380.00	2,200.00	2,200.00	1,500.00	1,500.00	3,500.00	3,500.00
618 - 43	Pump Station and Controls	EA	1	500,000.00	500,000.00	325,000.00	325,000.00	154,651.00	154,651.00	380,224.50	380,224.50
619 - 1	Remove and Relocate Pump Station and Controls	EA	1	62,000.00	62,000.00	150,000.00	150,000.00	76,000.00	76,000.00	100,000.00	100,000.00
619 - 2	Pump Reconditioning Allowance	EA	1	2,500.00	2,500.00	2,500.00	2,500.00	2,500.00	2,500.00	2,500.00	2,500.00
621 - 7	Storm Drain Hydrostatic Test (Contingent Bid Item)	EA	5	10,000.00	50,000.00	1,620.00	8,100.00	4,000.00	20,000.00	700.00	3,500.00
625 - 1	Storm Drain Manhole MAG DET 521, 522 & 523	EA	5	5,750.00	28,750.00	6,200.00	31,000.00	6,500.00	32,500.00	7,000.00	35,000.00
625 - 2	Storm Drain Manhole MAG DET 522, 523 & Detail A	EA	8	6,900.00	55,200.00	8,600.00	68,800.00	7,900.00	63,200.00	10,000.00	80,000.00
625 - 3	Storm Drain Manhole MAG DET 522, 523, & Detail B	EA	3	9,200.00	27,600.00	14,000.00	42,000.00	11,000.00	33,000.00	10,000.00	30,000.00
	TOTAL DOLLARS				**7,378,532.00**		**5,598,217.75**		**5,602,747.50**		**6,630,000.00**
	DIFFERENCE IN DOLLARS FROM ENGINEER'S ESTIMATE						**(1,780,314.25)**		**(1,775,784.50)**		**(748,532.00)**
	DIFFERENCE IN DOLLARS FROM LOW BID								**4,529.75**		**1,031,782.25**

Contract FCD 99-04
43rd Avenue Storm Drain

BID TAB

Bid Opening June 16, 1999

				Engineer's Estimate		Klewit Western		Barnard Construction		Hunter Contracting	
Item No.	QTY.	Unit	Qty	Unit Price	Bid Total	Unit Price	Bid Total	Unit Price	Bid Total	Unit Price	Bid Total
105 - 1	Partnering	LS	1	15,000.00	15,000.00	15,000.00	15,000.00	15,000.00	15,000.00	15,000.00	15,000.00
107 - 1	NPDES / SWPPP Permits	LS	1	20,000.00	20,000.00	7,031.00	7,031.00	25,000.00	25,000.00	5,000.00	5,000.00
107 - 2	Public Information and Notification Allowance	LS	1	25,000.00	25,000.00	25,000.00	25,000.00	25,000.00	25,000.00	25,000.00	25,000.00
107 - 3	Project Signs Allowance	LS	1	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00
202 - 1	Mobilization	LS	1	205,000.00	205,000.00	100,000.00	100,000.00	190,000.00	190,000.00	215,000.00	215,000.00
336 - 1	Pavement Replacement (4"AC/8"ABC)	SY	13,145	21.50	282,617.50	21.00	276,045.00	12.00	157,740.00	13.00	170,885.00
336 - 2	Pavement Replacement (4"AC/10"ABC)	SY	19,251	22.00	423,522.00	24.00	462,024.00	16.00	308,016.00	13.30	256,038.30
340 - 1	Curb and Gutter, MAG DET 220, Type A	LF	242	5.75	1,391.50	12.00	2,904.00	15.00	3,630.00	12.00	2,904.00
340 - 2	Sidewalk, MAG DET 230	SF	902	3.00	2,706.00	3.00	2,706.00	3.00	2,706.00	3.00	2,706.00
345 - 1	Adjust Manhole Frame and Cover	EA	13	1,150.00	14,950.00	300.00	3,900.00	750.00	9,750.00	340.00	4,420.00
345 - 2	Adjust Water Valve Box and Cover, Type A	EA	5	1,150.00	5,750.00	250.00	1,250.00	750.00	3,750.00	170.00	850.00
350 - 1	Removal of Existing Improvements	LS	1	11,500.00	11,500.00	10,000.00	10,000.00	100,000.00	100,000.00	90,000.00	90,000.00
401 - 1	Traffic Control	LS	1	150,000.00	150,000.00	75,000.00	75,000.00	15,000.00	15,000.00	60,000.00	60,000.00
405 - 1	Survey Monument MAG DET 120-1, Type A	EA	3	400.00	1,200.00	250.00	750.00	600.00	1,800.00	380.00	1,140.00
405 - 2	Survey Monument MAG DET 120-1, Type B	EA	7	230.00	1,610.00	125.00	875.00	600.00	4,200.00	150.00	1,050.00
420 - 1	24' Chain Link Fence Gate	EA	1	575.00	575.00	2,000.00	2,000.00	3,500.00	3,500.00	1,200.00	1,200.00
505 - 1	Special Junction Structure	EA	1	28,750.00	28,750.00	20,000.00	20,000.00	21,000.00	21,000.00	23,000.00	23,000.00
505 - 2	Concrete Headwall	EA	1	4,600.00	4,600.00	4,500.00	4,500.00	10,000.00	10,000.00	15,000.00	15,000.00
505 - 3	Concrete Box Culvert, ADOT Det B 02.10	LF	90	690.00	62,100.00	660.00	59,400.00	400.00	36,000.00	540.00	48,600.00
505 - 4	Concrete Catch Basin COP Det P 1569-1, M-1, L=10	EA	2	2,875.00	5,750.00	5,000.00	10,000.00	4,300.00	8,600.00	3,700.00	7,400.00
505 - 5	Concrete Catch Basin COP Det P 1569-1, M-1, L=17	EA	2	3,220.00	6,440.00	5,000.00	10,000.00	4,900.00	9,800.00	4,400.00	8,800.00
505 - 6	Concrete Catch Basin COP Det P 1569-1, M-2, L=6	EA	5	3,450.00	17,250.00	4,800.00	24,000.00	6,300.00	31,500.00	4,800.00	24,000.00
505 - 7	Concrete Catch Basin COP Det P 1569-1, M-2, L=10	EA	6	4,025.00	24,150.00	4,800.00	28,800.00	7,000.00	42,000.00	5,500.00	33,000.00
505 - 8	Concrete Catch Basin COP Det P 1569-1, M-2, L=17	EA	9	5,175.00	46,575.00	7,600.00	68,400.00	11,000.00	99,000.00	6,500.00	58,500.00
505 - 9	Concrete Catch Basin COP Det P 1570, N-Double	EA	1	3,450.00	3,450.00	3,700.00	3,700.00	4,000.00	4,000.00	3,700.00	3,700.00
515 - 1	10' x 5' Flap Gate	EA	1	17,250.00	17,250.00	25,000.00	25,000.00	30,000.00	30,000.00	25,000.00	25,000.00
601 - 1	Permanent Pipe Supports, MAG Det 403-3	EA	3	1,150.00	3,450.00	2,000.00	6,000.00	1,000.00	3,000.00	3,000.00	9,000.00
610 - 1	12" Ductile Iron Water Pipe and Fittings	LF	151	52.00	7,852.00	90.00	13,590.00	150.00	22,650.00	70.00	10,570.00
610 - 2	Replace Water Service Pipe (Contingent Bid Item)	LF	60	5.75	345.00	30.00	1,800.00	150.00	9,000.00	35.00	2,100.00

Contract FCD 99-04
43rd Avenue Storm Drain

BID TAB

Bid Opening June 16, 1999

				Engineer's Estimate		Kiewit Western		Barnard Construction		Hunter Contracting	
Item No.	QTY.	Unit	Qty	Unit Price	Bid Total	Unit Price	Bid Total	Unit Price	Bid Total	Unit Price	Bid Total
610 - 3	Relocate Water Meter (Contingent Bid Item)	EA	1	230.00	230.00	300.00	300.00	1,100.00	1,100.00	1,000.00	1,000.00
618 - 1	114 Inch Pipe, Class III RGRCP OR 621-1, 114 Inch CLCMP 1	LF	4,420	525.00	2,320,500.00	450.00	1,989,000.00	480.00	2,121,600.00	525.00	2,320,500.00
618 - 2	114 Inch Pipe, Class IV RGRCP OR 621-1, 114 Inch CLCMP 1	LF	2,682	525.00	1,408,050.00	527.00	1,413,414.00	525.00	1,408,050.00	475.00	1,273,950.00
618 - 3	96 Inch Pipe, Class III RGRCP OR 621-2, 96 Inch CLCMP 10 (	LF	60	340.00	20,400.00	400.00	24,000.00	400.00	24,000.00	570.00	34,200.00
618 - 4	84 Inch Pipe, Class III RGRCP OR 621-3, 84 Inch CLCMP 10 (	LF	60	250.00	15,000.00	380.00	22,800.00	350.00	21,000.00	600.00	36,000.00
618 - 5	72 Inch Pipe, Class III RGRCP OR 621-4, 72 Inch CLCMP 10 (	LF	720	200.00	144,000.00	270.00	194,400.00	240.00	172,800.00	310.00	223,200.00
618 - 6	72 Inch Pipe, Class IV RGRCP OR 621-4, 72 Inch CLCMP 10 (	LF	200	200.00	40,000.00	280.00	56,000.00	250.00	50,000.00	375.00	75,000.00
618 - 7	66 Inch Pipe, Class III RGRCP OR 621-5, 66 Inch CLCMP 12 (	LF	2,193	190.00	416,670.00	250.00	548,250.00	240.00	526,320.00	310.00	679,830.00
618 - 8	54 Inch Pipe, Class III RGRCP OR 621-6, 54 Inch CLCMP 14 (	LF	73	112.00	8,176.00	260.00	18,980.00	300.00	21,900.00	720.00	52,560.00
618 - 9	Bore & Jack 114 Inch Pipe	LF	170	4,000.00	680,000.00	3,000.00	510,000.00	3,200.00	544,000.00	3,800.00	646,000.00
618 - 10	Pipe Plug, MAG Det 427, 72 INCH	EA	2	2,750.00	5,500.00	500.00	1,000.00	1,200.00	2,400.00	1,000.00	2,000.00
618 - 11	Pipe Plug, MAG Det 427, 66 INCH	EA	2	2,750.00	5,500.00	450.00	900.00	900.00	1,800.00	600.00	1,200.00
618 - 12	Pipe Plug, MAG Det 427, 54 INCH	EA	1	1,725.00	1,725.00	425.00	425.00	850.00	850.00	500.00	500.00
618 - 13	Pipe Plug, MAG Det 427, 24 INCH	EA	2	1,725.00	3,450.00	100.00	200.00	500.00	1,000.00	300.00	600.00
618 - 14	15 Inch Catch Basin Connector Pipe, Class III	LF	78	80.00	6,240.00	120.00	9,360.00	300.00	23,400.00	170.00	13,260.00
618 - 15	15 Inch Catch Basin Connector Pipe, Class IV	LF	188	80.00	15,040.00	122.00	22,936.00	250.00	47,000.00	200.00	37,600.00
618 - 16	18 Inch Catch Basin Connector Pipe, Class III	LF	10	92.00	920.00	175.00	1,750.00	600.00	6,000.00	450.00	4,500.00
618 - 17	18 Inch Catch Basin Connector Pipe, Class IV	LF	126	92.00	11,592.00	180.00	22,680.00	275.00	34,650.00	230.00	28,980.00
618 - 18	24 Inch Catch Basin Connector Pipe, Class III	LF	103	125.00	12,875.00	125.00	12,875.00	250.00	25,750.00	170.00	17,510.00
618 - 19	24 Inch Catch Basin Connector Pipe, Class IV	LF	264	125.00	33,000.00	150.00	39,600.00	300.00	79,200.00	270.00	71,280.00
618 - 20	24 Inch Catch Basin Connector Pipe, Class V	LF	64	125.00	8,000.00	300.00	19,200.00	1,000.00	64,000.00	145.00	9,280.00
618 - 21	30 Inch Catch Basin Connector Pipe, Class III	LF	20	138.00	2,760.00	140.00	2,800.00	275.00	5,500.00	180.00	3,600.00
618 - 22	30 Inch Catch Basin Connector Pipe, Class IV	LF	62	138.00	8,556.00	240.00	14,880.00	325.00	20,150.00	190.00	11,780.00
618 - 23	30 Inch Catch Basin Connector Pipe, Class V	LF	59	138.00	8,142.00	350.00	20,650.00	1,000.00	59,000.00	170.00	10,030.00
618 - 24	72 Inch Catch Basin Connector Pipe, Class IV	LF	64	138.00	8,832.00	520.00	33,280.00	400.00	25,600.00	320.00	20,480.00
618 - 25	72 Inch To 84 Inch Pipe Transition	EA	1	11,500.00	11,500.00	2,200.00	2,200.00	1,200.00	1,200.00	2,900.00	2,900.00
618 - 26	84 Inch To 96 Inch Pipe Transition	EA	1	11,500.00	11,500.00	2,400.00	2,400.00	1,400.00	1,400.00	3,000.00	3,000.00
618 - 27	96 Inch To 114 Inch Pipe Transition	EA	1	11,500.00	11,500.00	2,600.00	2,600.00	1,800.00	1,800.00	3,400.00	3,400.00
618 - 28	114 Inch x 15 Inch Prefab Tee	EA	1	1,150.00	1,150.00	760.00	760.00	600.00	600.00	1,700.00	1,700.00

Contract FCD 99-04
43rd Avenue Storm Drain

BID TAB

Bid Opening June 16, 1999

				Engineer's Estimate		Kiewit Western		Barnard Construction		Hunter Contracting	
Item No.	QTY.	Unit	Qty	Unit Price	Bid Total	Unit Price	Bid Total	Unit Price	Bid Total	Unit Price	Bid Total
618 - 29	114 Inch x 18 Inch Prefab Tee	EA	1	1,150.00	1,150.00	765.00	765.00	600.00	600.00	1,700.00	1,700.00
618 - 30	114 Inch x 24 Inch Prefab Tee	EA	4	1,150.00	4,600.00	770.00	3,080.00	600.00	2,400.00	1,700.00	6,800.00
618 - 31	114 Inch x 24 Inch Prefab Tangent Tee	EA	1	1,150.00	1,150.00	775.00	775.00	600.00	600.00	1,700.00	1,700.00
618 - 32	114 Inch x 30 Inch Prefab Tee	EA	1	1,150.00	1,150.00	780.00	780.00	600.00	600.00	1,700.00	1,700.00
618 - 33	114 Inch x 30 Inch Prefab Tangent Tee with trash rack	EA	1	2,300.00	2,300.00	785.00	785.00	800.00	800.00	2,000.00	2,000.00
618 - 34	114 Inch x 66 Inch Prefab Tee	EA	1	1,150.00	1,150.00	900.00	900.00	1,200.00	1,200.00	2,200.00	2,200.00
618 - 35	114 Inch x 72 Inch Prefab Tangent Tee	EA	1	1,150.00	1,150.00	1,100.00	1,100.00	1,300.00	1,300.00	2,500.00	2,500.00
618 - 36	66 Inch x 15 Inch Tee	EA	6	1,150.00	6,900.00	760.00	4,560.00	500.00	3,000.00	1,700.00	10,200.00
618 - 37	66 Inch x 18 Inch Tee	EA	2	1,150.00	2,300.00	770.00	1,540.00	500.00	1,000.00	1,700.00	3,400.00
618 - 38	66 Inch x 24 Inch Tee	EA	4	1,150.00	4,600.00	775.00	3,100.00	500.00	2,000.00	1,700.00	6,800.00
618 - 39	66 Inch x 30 Inch Tee	EA	1	1,150.00	1,150.00	780.00	780.00	500.00	500.00	1,700.00	1,700.00
618 - 40	Concrete Pipe Collar, MAG DET 505 (24" & Larger)	EA	1	1,150.00	1,150.00	320.00	320.00	800.00	800.00	650.00	650.00
618 - 41	Prefab 30 Degree Bend, 114 Inch Pipe	EA	2	1,380.00	2,760.00	2,700.00	5,400.00	1,800.00	3,600.00	2,500.00	5,000.00
618 - 42	Prefab 45 Degree Bend, 114 Inch Pipe	EA	1	1,380.00	1,380.00	2,800.00	2,800.00	1,800.00	1,800.00	2,500.00	2,500.00
618 - 43	Pump Station and Controls	EA	1	500,000.00	500,000.00	250,000.00	250,000.00	250,000.00	250,000.00	320,000.00	320,000.00
619 - 1	Remove and Relocate Pump Station and Controls	EA	1	62,000.00	62,000.00	150,000.00	150,000.00	85,000.00	85,000.00	140,000.00	140,000.00
619 - 2	Pump Reconditioning Allowance	EA	1	2,500.00	2,500.00	2,500.00	2,500.00	2,500.00	2,500.00	2,500.00	2,500.00
621 - 7	Storm Drain Hydrostatic Test (Contingent Bid Item)	EA	5	10,000.00	50,000.00	7,200.00	36,000.00	11,000.00	55,000.00	4,000.00	20,000.00
625 - 1	Storm Drain Manhole MAG DET 521, 522 & 523	EA	5	5,750.00	28,750.00	8,000.00	40,000.00	5,000.00	25,000.00	6,400.00	32,000.00
625 - 2	Storm Drain Manhole MAG DET 522, 523 & Detail A	EA	8	6,900.00	55,200.00	11,000.00	88,000.00	5,500.00	44,000.00	9,800.00	78,400.00
625 - 3	Storm Drain Manhole MAG DET 522, 523, & Detail B	EA	3	9,200.00	27,600.00	12,000.00	36,000.00	5,500.00	16,500.00	7,500.00	22,500.00
	TOTAL DOLLARS				**7,378,532.00**		**6,886,500.00**		**6,991,912.00**		**7,379,953.30**
	DIFFERENCE IN DOLLARS FROM ENGINEER'S ESTIMATE						**(492,032.00)**		**(386,620.00)**		**1,421.30**
	DIFFERENCE IN DOLLARS FROM LOW BID						**1,288,282.25**		**1,393,694.25**		**1,781,735.55**

Contract FCD 99-04
43rd Avenue Storm Drain

BID TAB

Bid Opening June 16, 1999

				Engineer's Estimate		Mercury Constructors		Kleven Construction	
Item No.	QTY.	Unit	Qty	Unit Price	Bid Total	Unit Price	Bid Total	Unit Price	Bid Total
105 - 1	Partnering	LS	1	15,000.00	15,000.00	15,000.00	15,000.00	15,000.00	15,000.00
107 - 1	NPDES / SWPPP Permits	LS	1	20,000.00	20,000.00	100,000.00	100,000.00	7,000.00	7,000.00
107 - 2	Public Information and Notification Allowance	LS	1	25,000.00	25,000.00	25,000.00	25,000.00	25,000.00	25,000.00
107 - 3	Project Signs Allowance	LS	1	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00
202 - 1	Mobilization	LS	1	205,000.00	205,000.00	220,000.00	220,000.00	175,000.00	175,000.00
336 - 1	Pavement Replacement (4"AC/8"ABC)	SY	13,145	21.50	282,617.50	12.00	157,740.00	16.00	210,320.00
336 - 2	Pavement Replacement (4"AC/10"ABC)	SY	19,251	22.00	423,522.00	14.00	269,514.00	17.00	327,267.00
340 - 1	Curb and Gutter, MAG DET 220, Type A	LF	242	5.75	1,391.50	15.00	3,630.00	18.00	4,356.00
340 - 2	Sidewalk, MAG DET 230	SF	902	3.00	2,706.00	2.00	1,804.00	7.00	6,314.00
345 - 1	Adjust Manhole Frame and Cover	EA	13	1,150.00	14,950.00	300.00	3,900.00	400.00	5,200.00
345 - 2	Adjust Water Valve Box and Cover, Type A	EA	5	1,150.00	5,750.00	250.00	1,250.00	365.00	1,825.00
350 - 1	Removal of Existing Improvements	LS	1	11,500.00	11,500.00	400,000.00	400,000.00	27,000.00	27,000.00
401 - 1	Traffic Control	LS	1	150,000.00	150,000.00	75,000.00	75,000.00	85,000.00	85,000.00
405 - 1	Survey Monument MAG DET 120-1, Type A	EA	3	400.00	1,200.00	250.00	750.00	200.00	600.00
405 - 2	Survey Monument MAG DET 120-1, Type B	EA	7	230.00	1,610.00	225.00	1,575.00	300.00	2,100.00
420 - 1	24' Chain Link Fence Gate	EA	1	575.00	575.00	1,500.00	1,500.00	1,500.00	1,500.00
505 - 1	Special Junction Structure	EA	1	28,750.00	28,750.00	12,000.00	12,000.00	28,000.00	28,000.00
505 - 2	Concrete Headwall	EA	1	4,600.00	4,600.00	4,000.00	4,000.00	5,000.00	5,000.00
505 - 3	Concrete Box Culvert, ADOT Det B 02.10	LF	90	690.00	62,100.00	575.00	51,750.00	475.00	42,750.00
505 - 4	Concrete Catch Basin COP Det P 1569-1, M-1, L=10	EA	2	2,875.00	5,750.00	2,500.00	5,000.00	2,800.00	5,600.00
505 - 5	Concrete Catch Basin COP Det P 1569-1, M-1, L=17	EA	2	3,220.00	6,440.00	3,000.00	6,000.00	1,650.00	3,300.00
505 - 6	Concrete Catch Basin COP Det P 1569-1, M-2, L=6	EA	5	3,450.00	17,250.00	3,000.00	15,000.00	2,900.00	14,500.00
505 - 7	Concrete Catch Basin COP Det P 1569-1, M-2, L=10	EA	6	4,025.00	24,150.00	4,000.00	24,000.00	3,900.00	23,400.00
505 - 8	Concrete Catch Basin COP Det P 1569-1, M-2, L=17	EA	9	5,175.00	46,575.00	5,000.00	45,000.00	4,900.00	44,100.00
505 - 9	Concrete Catch Basin COP Det P 1570, N-Double	EA	1	3,450.00	3,450.00	2,000.00	2,000.00	2,400.00	2,400.00
515 - 1	10' x 5' Flap Gate	EA	1	17,250.00	17,250.00	25,000.00	25,000.00	29,000.00	29,000.00
601 - 1	Permanent Pipe Supports, MAG Det 403-3	EA	3	1,150.00	3,450.00	1,500.00	4,500.00	800.00	2,400.00
610 - 1	12" Ductile Iron Water Pipe and Fittings	LF	151	52.00	7,852.00	100.00	15,100.00	86.00	12,986.00
610 - 2	Replace Water Service Pipe (Contingent Bid Item)	LF	60	5.75	345.00	15.00	900.00	23.00	1,380.00

Contract FCD 99-04
43rd Avenue Storm Drain

BID TAB

Bid Opening June 16, 1999

				Engineer's Estimate		Mercury Constructors		Kleven Construction	
Item No.	QTY.	Unit	Qty	Unit Price	Bid Total	Unit Price	Bid Total	Unit Price	Bid Total
610 - 3	Relocate Water Meter (Contingent Bid Item)	EA	1	230.00	230.00	350.00	350.00	145.00	145.00
618 - 1	114 Inch Pipe, Class III RGRCP OR 621-1, 114 Inch CLCMP 1	LF	4,420	525.00	2,320,500.00	400.00	1,768,000.00	675.00	2,983,500.00
618 - 2	114 Inch Pipe, Class IV RGRCP OR 621-1, 114 Inch CLCMP 1	LF	2,682	525.00	1,408,050.00	430.00	1,153,260.00	735.00	1,971,270.00
618 - 3	96 Inch Pipe, Class III RGRCP OR 621-2, 96 Inch CLCMP 10	LF	60	340.00	20,400.00	400.00	24,000.00	545.00	32,700.00
618 - 4	84 Inch Pipe, Class III RGRCP OR 621-3, 84 Inch CLCMP 10	LF	60	250.00	15,000.00	350.00	21,000.00	450.00	27,000.00
618 - 5	72 Inch Pipe, Class III RGRCP OR 621-4, 72 Inch CLCMP 10	LF	720	200.00	144,000.00	250.00	180,000.00	320.00	230,400.00
618 - 6	72 Inch Pipe, Class IV RGRCP OR 621-4, 72 Inch CLCMP 10	LF	200	200.00	40,000.00	300.00	60,000.00	343.00	68,600.00
618 - 7	66 Inch Pipe, Class III RGRCP OR 621-5, 66 Inch CLCMP 12	LF	2,193	190.00	416,670.00	250.00	548,250.00	260.00	570,180.00
618 - 8	54 Inch Pipe, Class III RGRCP OR 621-6, 54 Inch CLCMP 14	LF	73	112.00	8,176.00	200.00	14,600.00	230.00	16,790.00
618 - 9	Bore & Jack 114 Inch Pipe	LF	170	4,000.00	680,000.00	7,300.00	1,241,000.00	3,900.00	663,000.00
618 - 10	Pipe Plug, MAG Det 427, 72 INCH	EA	2	2,750.00	5,500.00	850.00	1,700.00	1,800.00	3,600.00
618 - 11	Pipe Plug, MAG Det 427, 66 INCH	EA	2	2,750.00	5,500.00	750.00	1,500.00	1,750.00	3,500.00
618 - 12	Pipe Plug, MAG Det 427, 54 INCH	EA	1	1,725.00	1,725.00	600.00	600.00	1,350.00	1,350.00
618 - 13	Pipe Plug, MAG Det 427, 24 INCH	EA	2	1,725.00	3,450.00	300.00	600.00	335.00	670.00
618 - 14	15 Inch Catch Basin Connector Pipe, Class III	LF	78	80.00	6,240.00	80.00	6,240.00	122.00	9,516.00
618 - 15	15 Inch Catch Basin Connector Pipe, Class IV	LF	188	80.00	15,040.00	80.00	15,040.00	135.00	25,380.00
618 - 16	18 Inch Catch Basin Connector Pipe, Class III	LF	10	92.00	920.00	80.00	800.00	135.00	1,350.00
618 - 17	18 Inch Catch Basin Connector Pipe, Class IV	LF	126	92.00	11,592.00	80.00	10,080.00	145.00	18,270.00
618 - 18	24 Inch Catch Basin Connector Pipe, Class III	LF	103	125.00	12,875.00	90.00	9,270.00	154.00	15,862.00
618 - 19	24 Inch Catch Basin Connector Pipe, Class IV	LF	264	125.00	33,000.00	95.00	25,080.00	165.00	43,560.00
618 - 20	24 Inch Catch Basin Connector Pipe, Class V	LF	64	125.00	8,000.00	200.00	12,800.00	177.00	11,328.00
618 - 21	30 Inch Catch Basin Connector Pipe, Class III	LF	20	138.00	2,760.00	100.00	2,000.00	177.00	3,540.00
618 - 22	30 Inch Catch Basin Connector Pipe, Class IV	LF	62	138.00	8,556.00	110.00	6,820.00	192.00	11,904.00
618 - 23	30 Inch Catch Basin Connector Pipe, Class V	LF	59	138.00	8,142.00	250.00	14,750.00	205.00	12,095.00
618 - 24	72 Inch Catch Basin Connector Pipe, Class IV	LF	64	138.00	8,832.00	300.00	19,200.00	375.00	24,000.00
618 - 25	72 Inch To 84 Inch Pipe Transition	EA	1	11,500.00	11,500.00	2,000.00	2,000.00	14,000.00	14,000.00
618 - 26	84 Inch To 96 Inch Pipe Transition	EA	1	11,500.00	11,500.00	2,000.00	2,000.00	20,000.00	20,000.00
618 - 27	96 Inch To 114 Inch Pipe Transition	EA	1	11,500.00	11,500.00	2,500.00	2,500.00	34,000.00	34,000.00
618 - 28	114 Inch x 15 Inch Prefab Tee	EA	1	1,150.00	1,150.00	650.00	650.00	2,000.00	2,000.00

				Engineer's Estimate		Mercury Constructors		Kleven Construction	
Item No.	QTY.	Unit	Qty	Unit Price	Bid Total	Unit Price	Bid Total	Unit Price	Bid Total
618 - 29	114 Inch x 18 Inch Prefab Tee	EA	1	1,150.00	1,150.00	650.00	650.00	2,000.00	2,000.00
618 - 30	114 Inch x 24 Inch Prefab Tee	EA	4	1,150.00	4,600.00	650.00	2,600.00	2,200.00	8,800.00
618 - 31	114 Inch x 24 Inch Prefab Tangent Tee	EA	1	1,150.00	1,150.00	650.00	650.00	2,500.00	2,500.00
618 - 32	114 Inch x 30 Inch Prefab Tee	EA	1	1,150.00	1,150.00	650.00	650.00	2,200.00	2,200.00
618 - 33	114 Inch x 30 Inch Prefab Tangent Tee with trash rack	EA	1	2,300.00	2,300.00	950.00	950.00	5,800.00	5,800.00
618 - 34	114 Inch x 66 Inch Prefab Tee	EA	1	1,150.00	1,150.00	2,000.00	2,000.00	3,800.00	3,800.00
618 - 35	114 Inch x 72 Inch Prefab Tangent Tee	EA	1	1,150.00	1,150.00	2,000.00	2,000.00	8,000.00	8,000.00
618 - 36	66 Inch x 15 Inch Tee	EA	6	1,150.00	6,900.00	650.00	3,900.00	1,700.00	10,200.00
618 - 37	66 Inch x 18 Inch Tee	EA	2	1,150.00	2,300.00	650.00	1,300.00	1,700.00	3,400.00
618 - 38	66 Inch x 24 Inch Tee	EA	4	1,150.00	4,600.00	650.00	2,600.00	1,850.00	7,400.00
618 - 39	66 Inch x 30 Inch Tee	EA	1	1,150.00	1,150.00	650.00	650.00	1,975.00	1,975.00
618 - 40	Concrete Pipe Collar, MAG DET 505 (24" & Larger)	EA	1	1,150.00	1,150.00	5,000.00	5,000.00	3,400.00	3,400.00
618 - 41	Prefab 30 Degree Bend, 114 Inch Pipe	EA	2	1,380.00	2,760.00	2,000.00	4,000.00	17,000.00	34,000.00
618 - 42	Prefab 45 Degree Bend, 114 Inch Pipe	EA	1	1,380.00	1,380.00	2,000.00	2,000.00	17,000.00	17,000.00
618 - 43	Pump Station and Controls	EA	1	500,000.00	500,000.00	350,000.00	350,000.00	140,000.00	140,000.00
619 - 1	Remove and Relocate Pump Station and Controls	EA	1	62,000.00	62,000.00	200,000.00	200,000.00	120,000.00	120,000.00
619 - 2	Pump Reconditioning Allowance	EA	1	2,500.00	2,500.00	2,500.00	2,500.00	2,500.00	2,500.00
621 - 7	Storm Drain Hydrostatic Test (Contingent Bid Item)	EA	5	10,000.00	50,000.00	5,000.00	25,000.00	19,000.00	95,000.00
625 - 1	Storm Drain Manhole MAG DET 521, 522 & 523	EA	5	5,750.00	28,750.00	6,500.00	32,500.00	12,500.00	62,500.00
625 - 2	Storm Drain Manhole MAG DET 522, 523 & Detail A	EA	8	6,900.00	55,200.00	10,000.00	80,000.00	13,000.00	104,000.00
625 - 3	Storm Drain Manhole MAG DET 522, 523, & Detail B	EA	3	9,200.00	27,600.00	15,000.00	45,000.00	14,000.00	42,000.00
	TOTAL DOLLARS				**7,378,532.00**		**7,404,953.00**		**8,614,283.00**
	DIFFERENCE IN DOLLARS FROM ENGINEER'S ESTIMATE						**26,421.00**		**1,235,751.00**
	DIFFERENCE IN DOLLARS FROM LOW BID						**1,806,735.25**		**3,016,065.25**

City of Phoenix

BID TABULATION

Program Id BE01RE16
Run Date 2/10/2005
Run Time 11:14 AM
Bid Date 2/8/2005

Project No. ST83130220-1

Description: 7th Ave:Dunlap-Hatcher-1

Item No.	Description	Unit	Quantity	Engineer's Unit Price	Combs Construction Company, Inc.	CS&W CONTRACTOR INC	B & F Contracting, Inc.	TALIS CONSTRUCTIO	PIERSON CONSTRUCTION CORPORATION
1 C3456000	Adjusting Frames, Covers, Valve Boxes On Existing Non-City Utilities, Contingent Item	Each	10.00	300.00	250.00	395.00	350.00	235.51	100.00
2 E6992000	"Allowance For Stormwater Pollution Prevention Best Management Practices (BMP'S)"	Lump Sum	1.00	5,000.00	5,000.00	5,000.00	5,000.00	5,000.00	5,000.00
3 M1042005	Allowance for Extra Work	Job	1.00	80,000.00	80,000.00	80,000.00	80,000.00	80,000.00	80,000.00
4 M3210240	Asphalt Concrete Surface Course, Type C 3/4, 4" Thick	Ton	30.00	50.00	90.00	131.70	30.00	170.59	200.00
5 M3290100	Emulsified Asphalt For Tack Coat, Type SS-1h	Ton	3.00	700.00	500.00	923.50	350.00	158.97	900.00
6 M3360250	Asphalt Concrete For Permanent Pavement Replacement, Type C 3/4, 5" Thick	Sq. Yd.	2,298.00	40.00	14.00	30.10	31.00	27.18	45.00
7 M3362100	Microseal Coat	Sq. Yd.	14,750.00	1.50	2.50	2.60	2.50	2.39	2.55
8 M3400400	Concrete Sidewalk, Std. Detail P-1230	Sq. Ft.	255.00	4.00	5.00	5.10	3.00	4.50	5.00
9 M3402201	Combined Concrete Curb and Gutter, Std. Detail 220, Type "A", H=6"	Lin. Ft.	47.00	9.00	16.00	19.70	9.00	21.70	20.00
10 M3500005	Remove Existing Manhole	Each	3.00	1,500.00	2,000.00	1,180.40	2,100.00	931.50	1,100.00
11 M3500010	Remove Portland Cement Concrete Single Curb; Curb and Gutter; Header Curb and Embankment Curb	Lin. Ft.	47.00	1.00	3.00	3.20	31.00	9.98	5.00

BID TABULATION

Project No. ST83130220-1

Description: 7th Ave:Dunlap-Hatcher-1

Item No.	Description	Unit	Quantity	Engineer's Unit Price	Combs Construction Company, Inc.	CS&W CONTRACTOR INC	B & F Contracting, Inc.	TALIS CONSTRUCTIO	PIERSON CONSTRUCTION CORPORATION
12 M3500020	Remove Portland Cement Concrete Sidewalk, Driveway, Valley Gutter & Slab	Sq. Ft.	255.00	1.00	2.50	2.10	12.50	2.59	1.00
13 M3500040	Remove Pipe, Backfill & Compact	Lin. Ft.	275.00	25.00	9.00	16.00	30.00	7.44	9.00
14 M3500300	Miscellaneous Removal and Other Work	Job	1.00	5,000.00	215,000.00	26,222.20	15,000.00	9,526.00	31,000.00
15 M4012000	Traffic Control Devices	Job	1.00	20,000.00	78,500.00	106,514.90	30,000.00	63,800.00	85,000.00
16 M4013000	Allowance for Uniformed, Off-duty Law Enforcement Officer	Job	1.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00
17 M4051202	Survey Marker, MAG Standard Det. 120-1, Type "B"	Each	8.00	300.00	110.00	125.10	300.00	235.51	160.00
18 M5051520	Concrete Catch Basin, Type "L", Phx. Supp. Detail P-1568	Each	1.00	2,500.00	4,000.00	3,556.90	3,100.00	5,635.33	3,200.00
19 M5051530	Concrete Catch Basin, Type "M-1, L=3-Ft" Phx. Supp. Detail P-1569-1	Each	1.00	2,500.00	2,200.00	2,816.10	3,100.00	3,170.56	2,935.00
20 M5051535	Concrete Catch Basin, Type "M-1, L=6-Ft" Phx. Supp. Detail P-1569-1	Each	2.00	2,500.00	3,200.00	3,017.10	3,200.00	3,523.83	3,100.00
21 M5051540	Concrete Catch Basin, Type "M-1, L=10-Ft", Phx. Supp. Detail P-1569-1	Each	5.00	2,500.00	3,400.00	2,956.40	3,600.00	3,877.10	3,200.00
22 M5051545	Concrete Catch Basin, Type "M-1, L=17-Ft", Phx. Supp. Detail P-1569-1	Each	10.00	3,500.00	3,800.00	4,256.80	3,700.00	5,039.27	4,400.00

BID TABULATION

Project No. ST83130220-1

Description: 7th Ave:Dunlap-Hatcher-1

Item No.	Description	Unit	Quantity	Engineer's Unit Price	Combs Construction Company, Inc.	CS&W CONTRACTOR INC	B & F Contracting, Inc.	TALIS CONSTRUCTIO	PIERSON CONSTRUCTION CORPORATION
23 M5051560	Concrete Catch Basin, Type "M-2, L=17-Ft", Phx. Supp. Detail P-1569-1	Each	1.00	5,000.00	4,400.00	4,262.10	3,700.00	6,753.26	4,700.00
24 M5051565	Concrete Catch Basin, Type "N, Single", Phx. Supp. Detail P-1570	Each	1.00	5,000.00	3,600.00	2,100.70	7,800.00	4,566.79	1,925.00
25 M6012100	Waterline Replacement	Each	10.00	2,000.00	2,400.00	1,003.40	1,500.00	786.61	500.00
26 M6014030	Permanent Pipe Support, MAG Standard Details 403-1, 403-2, or 403-3	Each	6.00	1,000.00	450.00	1,053.00	1,450.00	741.87	900.00
27 M6101803	Relocate Existing Water Meter	Each	2.00	700.00	850.00	876.10	300.00	476.03	500.00
28 M6103706	Waterline Realignment, 6" and 8", Contingent Item	Each	19.00	2,500.00	2,050.00	2,981.90	3,000.00	2,392.36	500.00
29 M6180036	36" Storm Sewer Pipe	Lin. Ft.	290.00	100.00	90.00	139.90	178.00	150.80	170.00
30 M6180048	48" Storm Sewer Pipe	Lin. Ft.	309.00	150.00	155.00	199.10	165.00	252.67	234.00
31 M6180054	54" Storm Sewer Pipe	Lin. Ft.	1,886.00	170.00	145.00	243.90	295.00	297.84	290.00
32 M6181015	15" Catch Basin Connector Pipe	Lin. Ft.	341.00	20.00	80.00	85.10	120.00	68.14	106.00
33 M6181018	18" Catch Basin Connector Pipe	Lin. Ft.	273.00	90.00	76.00	83.20	125.00	82.56	110.00
34 M6186042	48" X 48" X 15" Prefabricated Tee	Each	1.00	500.00	800.00	1,936.20	900.00	2,673.14	1,150.00

$200
$210 (2006)
AVE
$275
$285 to
286

BID TABULATION

Project No. ST83130220-1

Description: 7th Ave:Dunlap-Hatcher-1

Item No.	Description	Unit	Quantity	Engineer's Unit Price	Combs Construction Company, Inc.	CS&W CONTRACTOR INC	B & F Contracting, Inc.	TALIS CONSTRUCTIO	PIERSON CONSTRUCTION CORPORATION
35 M6186043	54" X 54" X 15" Prefabricated Tee	Each	9.00	500.00	800.00	1,504.90	1,500.00	1,847.70	1,500.00
36 M6186154	54" X 54" X 18" Prefabricated Tee	Each	6.00	500.00	800.00	1,504.90	1,500.00	3,182.27	1,500.00
37 M6187000	Prefabricated Pipe Bends, 15" and 18"	Each	1.00	500.00	1,100.00	166.30	350.00	453.42	250.00
38 M6250005	Storm Sewer Manhole, MAG Standard Detail 522, COP Supp. Std. Detail P-1520	Each	10.00	2,500.00	5,000.00	3,953.30	3,900.00	4,344.47	4,100.00
TOTALS FOR: ST83130220-1 7th Ave:Dunlap-Hatcher-1				859,425.00	1,078,750.50	1,186,693.00	1,233,515.50	1,251,256.53	1,270,964.50

City of Phoenix

BID TABULATION

Program Id BE01RE16
Run Date 5/25/2005
Run Time 11:35 AM
Bid Date 5/24/2005

Project No. ST83110051-2

Description: 75th Ave: Salt River to Papago Freeway-2

Item No.	Description	Unit	Quantity	Engineer's Unit Price	T & T CONSTRUCTI INC	PIERSON CONSTRUCTI CORPORATIO	Kell and Company		
1 E6992000	"Allowance For Stormwater Pollution Prevention Best Management Practices (BMP'S)"	Lump Sum	1.00	30,000.00	30,000.00	30,000.00	30,000.00		
2 M1042005	Allowance for Extra Work	Job	1.00	530,000.00	530,000.00	530,000.00	530,000.00		
3 M2152000	Channel Excavation	Job	1.00	20,000.00	25,000.00	15,000.00	15,000.00		
4 M2153000	Install Irrigation Ditch, Unlined	Lin. Ft.	3,400.00	7.00	8.50	2.00	7.00		
5 M3290100	Emulsified Asphalt For Tack Coat, Type SS-1h	Ton	3.00	1,200.00	600.00	500.00	750.00		
6 M3304100	Power Broom	Hour	100.00	75.00	112.00	80.00	75.00		
7 M3360250	Asphalt Concrete For Permanent Pavement Replacement, Type C 3/4, 5" Thick	Sq. Yd.	12,000.00	31.00	31.00	43.00	22.00		
8 M3362100	Microseal Coat	Sq. Yd.	54,331.00	1.25	2.00	2.00	2.00		
9 M3402201	Combined Concrete Curb and Gutter, Std. Detail 220, Type "A", H=6"	Lin. Ft.	24.00	15.00	25.00	25.00	22.00		
10 M3404600	Vehicular Maintenance Access Ramp, Per Plans	Job	1.00	25,000.00	33,000.00	13,500.00	35,000.00		
11 M3500010	Remove Portland Cement Concrete Single Curb; Curb and Gutter; Header Curb and Embankment Curb	Lin. Ft.	204.00	5.00	8.00	4.00	8.00		

BID TABULATION

Project No. ST83110051-2

Description: 75th Ave: Salt River to Papago Freeway-2

Item No.	Description	Unit	Quantity	Engineer's Unit Price	T & T CONSTRUCTI INC	PIERSON CONSTRUCTI CORPORATIO	Kell and Company		
12 M3500020	Remove Portland Cement Concrete Sidewalk, Driveway, Valley Gutter & Slab	Sq. Ft.	200.00	2.50	7.00	1.00	5.00		
13 M3500030	Remove Structures, Backfill & Compact (Includes Handrail)	Job	1.00	10,000.00	3,000.00	4,500.00	10,000.00		
14 M3500040	Remove Pipe, Backfill & Compact	Lin. Ft.	161.00	20.00	12.00	9.00	75.00		
15 M3500300	Miscellaneous Removal and Other Work	Job	1.00	85,000.00	80,000.00	256,400.00	30,000.00		
16 M4012000	Traffic Control Devices	Job	1.00	93,000.00	134,000.00	160,000.00	200,000.00		
17 M4013000	Allowance for Uniformed, Off-duty Law Enforcement Officer	Job	1.00	40,000.00	40,000.00	40,000.00	40,000.00		
18 M4051201	Survey Marker, MAG Standard Det. 120-1, Type "A"	Each	30.00	300.00	280.00	350.00	500.00		
19 M4051202	Survey Marker, MAG Standard Det. 120-1, Type "B"	Each	8.00	150.00	280.00	250.00	200.00		
20 M4200006	Temporary 6-Foot Chain Link Fence	Lin. Ft.	1,200.00	4.00	6.00	2.00	22.00		
21 M4201002	Relocate Chain Link Fence Per Plans	Lin. Ft.	90.00	16.00	25.00	20.00	30.00		
22 M5051535	Concrete Catch Basin, Type "M-1, L=6-Ft" Phx. Supp. Detail P-1569-1	Each	4.00	2,390.00	3,250.00	4,100.00	3,300.00		
23 M5051536	Concrete Catch Basin, Modified, Type "M-1,	Each	8.00	2,500.00	3,250.00	4,150.00	3,500.00		

BID TABULATION

Project No. ST83110051-2

Description: 75th Ave: Salt River to Papago Freeway-2

Item No.	Description	Unit	Quantity	Engineer's Unit Price	T & T CONSTRUCTI INC	PIERSON CONSTRUCTI CORPORATIO	Kell and Company		
	L=6-Ft", Phx. Supp. Detail P-1569-2								
24 M5051565	Concrete Catch Basin, Type "N, Single", Phx. Supp. Detail P-1570	Each	19.00	25.00	2,025.00	2,800.00	2,500.00		
25 M5056098	Headwall for 96" Pipe Per Special Detail (Includes Access Barrier Per Dtl P1563; Handrail P Dtl P-1173; Pilot Channel Per Detail; Rip Rap and Structural Excavation)	Lump Sum	1.00	30,000.00	42,000.00	35,000.00	30,000.00		
26 M6012100	Waterline Replacement	Each	11.00	2,082.00	2,000.00	1,000.00	3,500.00		
27 M6014030	Permanent Pipe Support, MAG Standard Details 403-1, 403-2, or 403-3	Each	2.00	1,133.00	1,000.00	750.00	1,500.00		
28 M6100344	Waterline Relocation Per Plans	Job	1.00	20,550.00	24,500.00	25,000.00	50,000.00		
29 M6103706	Waterline Realignment, 6" and 8", Contingent Item	Each	5.00	3,000.00	5,000.00	1,500.00	3,000.00		
30 M6103710	Waterline Realignment, 10" and 12", Contingent Item	Each	7.00	4,000.00	6,000.00	2,500.00	4,000.00		
31 M6180042	42" Storm Sewer Pipe	Lin. Ft.	329.00	174.00	371.40	310.00	200.00		
32 M6180066	66" Storm Sewer Pipe	Lin. Ft.	4,389.00	239.84	254.00	335.00	442.00		
33 M6180078	78" Storm Sewer Pipe	Lin. Ft.	4,951.00	244.28	361.00	400.00	600.00		

BID TABULATION

Project No. ST83110051-2

Description: 75th Ave: Salt River to Papago Freeway-2

Item No.	Description	Unit	Quantity	Engineer's Unit Price	T & T CONSTRUCTI INC	PIERSON CONSTRUCTI CORPORATIO	Kell and Company		
34 M6180096	96" Storm Sewer Pipe	Lin. Ft.	4,657.00	357.55	481.00	500.00	725.00		
35 M6180427	Pipe Plug, Standard Detail 427	Each	12.00	469.00	650.00	250.00	500.00		
36 M6181015	15" Catch Basin Connector Pipe	Lin. Ft.	964.00	103.00	61.25	160.00	225.00		
37 M6182048	48" CCFRPM Storm Sewer Pipe; Furnish, Jack & Bore	Lin. Ft.	460.00	1,022.00	1,745.00	1,305.00	1,100.00		
38 M6186046	66" X 66" X 15" Prefabricated Tee	Each	15.00	425.00	1,400.00	900.00	2,500.00		
39 M6186060	78" X 78" X 15" Prefabricated Tee	Each	14.00	450.00	1,400.00	900.00	3,000.00		
40 M6186076	96" X 96" X 15" Prefabricated Tee	Each	14.00	500.00	1,400.00	900.00	3,500.00		
41 M6186237	78" X 78" X 42" Prefabricated Wye	Each	1.00	3,404.00	1,400.00	1,800.00	4,000.00		
42 M6186238	96" X 96" X 42" Prefabricated Wye	Each	1.00	3,500.00	1,400.00	1,800.00	5,000.00		
43 M6187026	96" - 11 1/4 degree Prefabricated Bend	Each	2.00	3,700.00	1,400.00	3,500.00	5,000.00		
44 M6187027	96" - 7 1/4 degree Prefabricated Bend	Each	1.00	3,700.00	1,400.00	3,500.00	5,000.00		
45 M6187188	Prefabricated 96" X 78" Transition Pipe	Each	1.00	3,500.00	1,400.00	3,500.00	5,000.00		
46 M6187189	Prefabricated 78" X 66" Transition Pipe	Each	1.00	2,644.00	1,400.00	3,500.00	4,500.00		

BID TABULATION

Project No. ST83110051-2

Description: 75th Ave: Salt River to Papago Freeway-2

Item No.	Description	Unit	Quantity	Engineer's Unit Price	T & T CONSTRUCTI INC	PIERSON CONSTRUCTI CORPORATIO	Kell and Company		
47 M6250005	Storm Sewer Manhole, MAG Standard Detail 522, COP Supp. Std. Detail P-1520	Each	3.00	2,586.00	5,400.00	2,800.00	4,000.00		
48 M6250010	Storm Sewer Manhole, MAG Standard Detail 521 and 522	Each	17.00	4,120.00	13,800.00	11,000.00	12,000.00		
49 M6250015	Storm Sewer Manhole Base Transition, Phoenix Supp. Detail P-1560 and MAG Std. Detail 522	Each	11.00	4,600.00	9,300.00	10,000.00	8,500.00		
50 M6255006	Storm Drain Junction Vault, Per Special Detail	Each	2.00	150,000.00	52,400.00	75,000.00	60,000.00		
TOTALS FOR: ST83110051-2 75th Ave: Salt River to Papago Freeway-2				6,509,812.14	8,319,960.60	9,064,372.00	11,283,410.00		

BID TABULATION

Alternate No. 01

Description: SRVWUA Irrigation Pipe - Salt River to Broadway Road

Item No.	Description	Unit	Quantity	Engineer's Unit Price	T & T CONSTRUCTI INC	PIERSON CONSTRUCTI CORPORATIO	Kell and Company		
51 S5051520	Manhole (SRVWUA Irrigation) Per Plans	Each	6.00	6,270.26	9,100.00	8,300.00	12,500.00		
52 S5052049	Headwall with Trashrack for 48" Pipe (SRVWUA Irrigation)	Each	1.00	7,000.00	8,250.00	4,200.00	15,000.00		
53 S6189024	24" R.G.R.C.P. (SRVWUA Irrigation)	Lin. Ft.	3,325.00	82.00	74.00	61.00	200.00		
54 S6189036	36" R.G.R.C.P. (SRVWUA Irrigation)	Lin. Ft.	1,100.00	96.44	98.00	75.00	250.00		
55 S6189048	48" R.G.R.C.P. (SRVWUA Irrigation)	Lin. Ft.	100.00	120.00	153.00	160.00	300.00		
TOTALS FOR: 01 SRVWUA Irrigation Pipe - Salt River to Broadway Road				435,355.56	432,000.00	355,325.00	1,060,000.00		
GRAND TOTALS				6,509,812.14	8,319,960.60	9,064,372.00	11,283,410.00		

City of Phoenix

BID TABULATION

Project No. ST87100147-1

Description: 31st Ave:Deer Valley Rd:-Foothill Dr.-1

Item No.	Description	Unit	Quantity	Engineer's Unit Price	J. BANICKI CONSTRUCTI				
1 C3456000	Adjusting Frames, Covers, Valve Boxes On Existing Non-City Utilities, Contingent Item	Each	2.00	150.00	350.00				
2 C6100122	1-1/2" and 2" Water Service Replacement Per Special Provisions, Contingency Item	Lin. Ft.	15.00	25.00	60.00				
3 C6100341	3/4" and 1" Water Service Replacement Per Special Provisions, Contingent Item	Lin. Ft.	15.00	20.00	45.00				
4 M1042005	Allowance for Extra Work	Job	1.00	30,000.00	30,000.00				
5 M3010001	Subgrade Preparation	Sq. Yd.	6,977.00	5.00	14.00				
6 M3100000	Aggregate Base Course	Ton	3,768.00	18.00	23.00				
7 M3210230	Asphalt Concrete Surface Course, Type C 3/4, 3" Thick	Ton	1,131.00	132.00	105.00				
8 M3304100	Power Broom	Hour	10.00	70.00	125.00				
9 M3400240	Concrete Valley Gutter, Std. Detail 240	Sq. Ft.	194.00	10.00	10.00				
10 M3400307	Concrete Valley Gutter,Std. Detail 240, Modified, 7' Wide	Sq. Ft.	189.00	10.00	10.00				
11 M3400400	Concrete Sidewalk, Std. Detail P-1230	Sq. Ft.	4,889.00	5.00	6.00				
12 M3400555	Concrete Driveway Entrance, Std. Detail P-1255-1	Sq. Ft.	1,316.00	7.00	7.50				

BID TABULATION

Project No. ST87100147-1

Description: 31st Ave:Deer Valley Rd:-Foothill Dr.-1

Item No.	Description	Unit	Quantity	Engineer's Unit Price	J. BANICKI CONSTRUCTI				
13 M3402201	Combined Concrete Curb and Gutter, Std. Detail 220, Type "A", H=6"	Lin. Ft.	875.00	18.00	15.00				
14 M3450020	Adjust Existing Manhole Frame and Cover, Standard Detail 422	Each	20.00	400.00	350.00				
15 M3453001	Adjust Existing Type "A" Water Valve, Standard Detail P-1391 and P-1391-1	Each	8.00	275.00	300.00				
16 M3500010	Remove Portland Cement Concrete Single Curb; Curb and Gutter; Header Curb and Embankment Curb	Lin. Ft.	115.00	5.00	7.00				
17 M3500020	Remove Portland Cement Concrete Sidewalk, Driveway, Valley Gutter & Slab	Sq. Ft.	100.00	2.00	4.00				
18 M3500300	Miscellaneous Removal and Other Work	Job	1.00	10,000.00	35,000.00				
19 M4012000	Traffic Control Devices	Job	1.00	7,000.00	75,000.00				
20 M4013000	Allowance for Uniformed, Off-duty Law Enforcement Officer	Job	1.00	5,000.00	5,000.00				
21 M4051201	Survey Marker, MAG Standard Det. 120-1, Type "A"	Each	3.00	300.00	400.00				
22 M4051202	Survey Marker, MAG Standard Det. 120-1, Type "B"	Each	5.00	200.00	130.00				
23 M6101801	Relocate Existing Water Meter, Box, and	Each	2.00	500.00	900.00				

City of Phoenix

BID TABULATION

Project No. ST87100147-1

Description: 31st Ave:Deer Valley Rd:-Foothill Dr.-1

Item No.	Description	Unit	Quantity	Engineer's Unit Price	J. BANICKI CONSTRUCTI				
	Cover								
TOTALS FOR: ST87100147-1 31st Ave:Deer Valley Rd:-Foothill Dr.-1				372,788.00	522,036.00				

BID TABULATION

Project No. ST83130263

Description: 31st Avenue Storm Drain, Deer Valley Rd.

Item No.	Description	Unit	Quantity	Engineer's Unit Price	J. BANICKI CONSTRUCTI				
24 C3456000	Adjusting Frames, Covers, Valve Boxes On Existing Non-City Utilities, Contingent Item	Each	2.00	100.00	350.00				
25 C6100122	1-1/2" and 2" Water Service Replacement Per Special Provisions, Contingency Item	Lin. Ft.	60.00	20.00	60.00				
26 C6100341	3/4" and 1" Water Service Replacement Per Special Provisions, Contingent Item	Lin. Ft.	60.00	20.00	45.00				
27 E6992000	"Allowance For Stormwater Pollution Prevention Best Management Practices (BMP'S)"	Lump Sum	1.00	2,500.00	2,500.00				
28 M1042005	Allowance for Extra Work	Job	1.00	45,000.00	45,000.00				
29 M3500010	Remove Portland Cement Concrete Single Curb; Curb and Gutter; Header Curb and Embankment Curb	Lin. Ft.	95.00	3.00	10.00				
30 M3500020	Remove Portland Cement Concrete Sidewalk, Driveway, Valley Gutter & Slab	Sq. Ft.	410.00	2.50	2.50				
31 M3500041	Remove Pipe	L. F.	350.00	2.00	28.00				
32 M3500045	Remove Pipe Plug	Each	1.00	1,000.00	1,000.00				
33 M3500300	Miscellaneous Removal and Other Work	Job	1.00	10,000.00	45,000.00				
34 M4012000	Traffic Control Devices	Job	1.00	9,000.00	25,000.00				

BID TABULATION

Project No. ST83130263

Description: 31st Avenue Storm Drain, Deer Valley Rd.

Item No.	Description	Unit	Quantity	Engineer's Unit Price	J. BANICKI CONSTRUCTI				
35 M4013000	Allowance for Uniformed, Off-duty Law Enforcement Officer	Job	1.00	5,000.00	5,000.00				
36 M5051525	Concrete Catch Basin, Type "M-1, L=0-Ft" Phx. Supp. Detail P-1569-1	Each	6.00	3,000.00	3,500.00				
37 M5051540	Concrete Catch Basin, Type "M-1, L=10-Ft", Phx. Supp. Detail P-1569-1	Each	2.00	4,000.00	5,900.00				
38 M5051545	Concrete Catch Basin, Type "M-1, L=17-Ft", Phx. Supp. Detail P-1569-1	Each	1.00	3,200.00	6,500.00				
39 M5155036	Storm Sewer Access Barrier, Standard Detail P-1563	Each	2.00	1,000.00	1,200.00				
40 M6000007	8" Cap, Tapped With 2" I.P. Corporation Stop, Furnish and Install	Each	1.00	500.00	325.00				
41 M6012100	Waterline Replacement	Each	2.00	2,000.00	15,000.00				
42 M6014030	Permanent Pipe Support, MAG Standard Details 403-1, 403-2, or 403-3	Each	8.00	1,000.00	1,500.00				
43 M6101801	Relocate Existing Water Meter, Box, and Cover	Each	1.00	500.00	900.00				
44 M6104008	8" Ductile Iron Water Pipe & Fittings, Restrained, Furnish & Install	L. F.	340.00	90.00	85.00				
45 M6180024	24" Storm Sewer Pipe	Lin. Ft.	1,175.00	100.00	125.00				

BID TABULATION

Project No. ST83130263

Description: 31st Avenue Storm Drain, Deer Valley Rd.

Item No.	Description	Unit	Quantity	Engineer's Unit Price	J. BANICKI CONSTRUCTI				
46 M6180030	30" Storm Sewer Pipe	Lin. Ft.	212.00	150.00	160.00				
47 M6180036	36" Storm Sewer Pipe	Lin. Ft.	1,528.00	180.00	180.00				
48 M6181015	15" Catch Basin Connector Pipe	Lin. Ft.	140.00	100.00	115.00				
49 M6184015	15" Rubber Gasket Reinforced Concrete Pipe, Class IV (Private Irrigation)	Lin. Ft.	41.00	55.00	115.00				
50 M6250005	Storm Sewer Manhole, MAG Standard Detail 522, COP Supp. Std. Detail P-1520	Each	15.00	3,000.00	5,500.00				
51 M6250020	Storm Sewer Manhole per Detail	Each	1.00	6,000.00	12,000.00				
52 M6303008	8" Valve, Box and Cover, Furnish & Install	Each	5.00	850.00	1,600.00				
TOTALS FOR: ST83130263 31st Avenue Storm Drain, Deer Valley Rd.				647,755.00	835,250.00				

BID TABULATION

Project No. ST87100146

Description: Foothills Drive Paving, 31st Ave. to 27t

Item No.	Description	Unit	Quantity	Engineer's Unit Price	J. BANICKI CONSTRUCTI				
53 C3456000	Adjusting Frames, Covers, Valve Boxes On Existing Non-City Utilities, Contingent Item	Each	2.00	200.00	350.00				
54 C6100122	1-1/2" and 2" Water Service Replacement Per Special Provisions, Contingency Item	Lin. Ft.	40.00	20.00	60.00				
55 C6100341	3/4" and 1" Water Service Replacement Per Special Provisions, Contingent Item	Lin. Ft.	75.00	20.00	45.00				
56 M1042005	Allowance for Extra Work	Job	1.00	45,000.00	45,000.00				
57 M3010001	Subgrade Preparation	Sq. Yd.	10,640.00	8.00	12.00				
58 M3100000	Aggregate Base Course	Ton	5,744.00	18.00	23.00				
59 M3210101	Asphalt Concrete Surface Course, Type C-3/4"For Driveway, Sidewalk and Parking Lot Connections	Ton	4.00	132.00	250.00				
60 M3210230	Asphalt Concrete Surface Course, Type C 3/4, 3" Thick	Ton	1,723.00	132.00	105.00				
61 M3304100	Power Broom	Hour	10.00	70.00	125.00				
62 M3400240	Concrete Valley Gutter, Std. Detail 240	Sq. Ft.	1,333.00	10.00	10.00				
63 M3400307	Concrete Valley Gutter,Std. Detail 240, Modified, 7' Wide	Sq. Ft.	1,049.00	10.00	10.00				

BID TABULATION

Project No. ST87100146

Description: Foothills Drive Paving, 31st Ave. to 27t

Item No.	Description	Unit	Quantity	Engineer's Unit Price	J. BANICKI CONSTRUCTI				
64 M3400400	Concrete Sidewalk, Std. Detail P-1230	Sq. Ft.	16,169.00	5.00	6.00				
65 M3400405	Decorative Concrete Sidewalk, Std. Detail P-1230 Modified (6" Thick)	Sq. Ft.	138.00	6.00	10.00				
66 M3400662	Concrete Driveway Entrance, Standard Detail P1255-1 (6" Thick)	Sq. Ft.	7,686.00	8.00	7.00				
67 M3400664	Concrete Driveway Entrance, Standard Detail P1255-1 (9" Thick)	Sq. Ft.	300.00	9.00	10.00				
68 M3402201	Combined Concrete Curb and Gutter, Std. Detail 220, Type "A", H=6"	Lin. Ft.	4,684.00	18.00	15.00				
69 M3450020	Adjust Existing Manhole Frame and Cover, Standard Detail 422	Each	6.00	300.00	350.00				
70 M3453001	Adjust Existing Type "A" Water Valve, Standard Detail P-1391 and P-1391-1	Each	16.00	250.00	300.00				
71 M3500010	Remove Portland Cement Concrete Single Curb; Curb and Gutter; Header Curb and Embankment Curb	Lin. Ft.	130.00	7.00	7.00				
72 M3500020	Remove Portland Cement Concrete Sidewalk, Driveway, Valley Gutter & Slab	Sq. Ft.	1,000.00	3.00	2.00				
73 M3500109	Remove Block Wall	Lin. Ft.	5.00	20.00	300.00				
74 M3500110	Remove Existing Fence	Lin. Ft.	47.00	10.00	25.00				

BID TABULATION

Project No. ST87100146

Description: Foothills Drive Paving, 31st Ave. to 27t

Item No.	Description	Unit	Quantity	Engineer's Unit Price	J. BANICKI CONSTRUCTI				
75 M3500300	Miscellaneous Removal and Other Work	Job	1.00	15,000.00	35,000.00				
76 M4012000	Traffic Control Devices	Job	1.00	8,000.00	20,000.00				
77 M4013000	Allowance for Uniformed, Off-duty Law Enforcement Officer	Job	1.00	5,000.00	5,000.00				
78 M4051202	Survey Marker, MAG Standard Det. 120-1, Type "B"	Each	6.00	200.00	150.00				
79 M4200032	Remove and Relocate Fence to R/W per Plans	Lin. Ft.	443.00	20.00	35.00				
80 M5000202	Relocate Irrigation Control Box, Complete in Place	Each	1.00	500.00	800.00				
81 M5050017	Concrete Retaining Wall, Per Plans	Sq. Ft.	882.00	15.00	42.00				
82 M6101801	Relocate Existing Water Meter, Box, and Cover	Each	15.00	500.00	900.00				
83 M6104300	Cutting and Plugging Existing Water Line	Each	4.00	650.00	500.00				
84 M6108010	Relocate Fire Hydrant	Each	4.00	1,700.00	7,000.00				
TOTALS FOR: ST87100146 Foothills Drive Paving, 31st Ave. to 27t				797,839.00	913,942.00				

BID TABULATION

Project No. ST83130262

Description: Foothills Drive Storm Drain, 31st Ave. t

Item No.	Description	Unit	Quantity	Engineer's Unit Price	J. BANICKI CONSTRUCTI				
85 C3456000	Adjusting Frames, Covers, Valve Boxes On Existing Non-City Utilities, Contingent Item	Each	1.00	200.00	350.00				
86 C6100122	1-1/2" and 2" Water Service Replacement Per Special Provisions, Contingency Item	Lin. Ft.	150.00	20.00	60.00				
87 C6100341	3/4" and 1" Water Service Replacement Per Special Provisions, Contingent Item	Lin. Ft.	150.00	20.00	45.00				
88 E6992000	"Allowance For Stormwater Pollution Prevention Best Management Practices (BMP'S)"	Lump Sum	1.00	2,000.00	2,000.00				
89 M1042005	Allowance for Extra Work	Job	1.00	45,000.00	45,000.00				
90 M3500300	Miscellaneous Removal and Other Work	Job	1.00	10,000.00	10,000.00				
91 M4012000	Traffic Control Devices	Job	1.00	8,000.00	30,000.00				
92 M4013000	Allowance for Uniformed, Off-duty Law Enforcement Officer	Job	1.00	5,000.00	5,000.00				
93 M5051535	Concrete Catch Basin, Type "M-1, L=6-Ft" Phx. Supp. Detail P-1569-1	Each	1.00	3,600.00	5,000.00				
94 M5051545	Concrete Catch Basin, Type "M-1, L=17-Ft", Phx. Supp. Detail P-1569-1	Each	1.00	3,200.00	6,500.00				
95 M6180024	24" Storm Sewer Pipe	Lin. Ft.	654.00	100.00	125.00				

BID TABULATION

Project No. ST83130262

Description: Foothills Drive Storm Drain, 31st Ave. t

Item No.	Description	Unit	Quantity	Engineer's Unit Price	J. BANICKI CONSTRUCTI				
96 M6181015	15" Catch Basin Connector Pipe	Lin. Ft.	38.00	100.00	120.00				
97 M6250005	Storm Sewer Manhole, MAG Standard Detail 522, COP Supp. Std. Detail P-1520	Each	4.00	3,000.00	5,500.00				
TOTALS FOR: ST83130262 Foothills Drive Storm Drain, 31st Ave. t				164,200.00	227,910.00				
GRAND TOTALS				1,982,582.00	2,499,138.00				

City of Phoenix

BID TABULATION

Program Id BE01RE16
Run Date 06/16/2006
Run Time 10:12
Bid Date 06/13/2006

Project No. WS85500268-1

Description: 27th Ave/Roosevelt/31st Ave/Van Buren-1

Item No.	Description	Unit	Quantity	Engineer's Unit Price	WGC, Inc.	PIERSON CONSTRUCTI CORPORATIO	J Wise Corp	TALIS CONSTRUCTIO	B & F Contracting, Inc.
1 C3453001	Adjust Existing Type "A" Water Valve Box & Cover, Contingent Item	Each	2.00	255.00	250.00	300.00	270.00	353.50	300.00
2 C3456000	Adjusting Frames, Covers, Valve Boxes On Existing Non-City Utilities, Contingent Item	Each	2.00	255.00	250.00	300.00	300.00	353.50	270.00
3 C6152999	D.I.P. Sanitary Sewer Replacement (Various Sizes), Contingent Item	Each	10.00	800.00	950.00	1,200.00	1,000.00	2,290.49	1,100.00
4 C6309065	Debris Cap, Including Locator Coil, Furnish and Install, Contingent Item	Each	30.00	130.00	150.00	150.00	90.00	104.31	160.00
5 E6992000	"Allowance For Stormwater Pollution Prevention Best Management Practices (BMP'S)"	Lump Sum	1.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00
6 M1042005	*Allowance for Extra Work*	Job	1.00	150,000.00	150,000.00	150,000.00	150,000.00	150,000.00	150,000.00
7 M3360230	Asphalt Concrete For Permanent Pavement Replacement, Type C 3/4, 3" Thick	Sq. Yd.	3,022.00	26.00	27.00	35.00	42.00	36.89	50.00
8 M3360250	Asphalt Concrete For Permanent Pavement Replacement, Type C 3/4, 5" Thick	Sq. Yd.	576.00	33.00	43.00	60.00	52.00	53.21	61.00
9 M3362000	Slurry Seal Coat	Sq. Yd.	93,555.00	1.30	1.55	1.40	1.30	1.44	2.00
10 M3500300	Miscellaneous Removal and Other Work	Job	1.00	30,000.00	1,000.00	40,000.00	40,000.00	64,698.53	40,000.00
11 M4012000	Traffic Control Devices	Job	1.00	40,000.00	67,500.00	50,000.00	50,000.00	71,486.80	95,000.00

BID TABULATION

Project No. WS85500268-1

Description: 27th Ave/Roosevelt/31st Ave/Van Buren-1

Item No.	Description	Unit	Quantity	Engineer's Unit Price	WGC, Inc.	PIERSON CONSTRUCTI CORPORATIO	J Wise Corp	TALIS CONSTRUCTIO	B & F Contracting, Inc.
12 M4013000	Allowance for Uniformed, Off-duty Law Enforcement Officer	Job	1.00	15,000.00	15,000.00	15,000.00	15,000.00	15,000.00	15,000.00
13 M6101800	Cast Iron Fittings in Excess of Quantity Shown on Plans, Furnish & Install, Contingent Item	Lb.	2,000.00	3.00	5.00	5.00	5.50	5.32	4.50
14 M6101805	Water Service Connection (Main to Meter)	Each	453.00	350.00	385.00	550.00	500.00	494.62	470.00
15 M6101810	3/4" or 1" Water Meter Service Connect. Pipe and Fittings, Main to Meter, Furnish & Install	Lin. Ft.	9,788.00	10.00	17.00	17.00	16.00	21.00	19.00
16 M6101820	1-1/2" or 2" Water Meter Service Connect Pipe and Fittings, Main to Meter, Furnish & Install	Lin. Ft.	91.00	35.00	32.00	70.00	90.00	56.29	70.00
17 M6102006	6" Ductile Iron Water Pipe and Fittings, Furnish & Install	L. F.	8,417.00	42.00	40.00	46.00	60.30	52.00	59.00
18 M6102008	8" Ductile Iron Water Pipe and Fittings, Furnish & Install	L. F.	1,258.00	50.00	45.00	49.50	63.30	54.82	69.00
19 M6102012	12" Ductile Iron Water Pipe & Fittings, Furnish & Install	L. F.	898.00	65.00	59.00	70.00	70.90	107.86	100.00
20 M6103706	Waterline Realignment, 6" and 8", Contingent Item	Each	2.00	2,500.00	500.00	800.00	1,000.00	4,832.89	3,900.00
21 M6103710	Waterline Realignment, 10" and 12", Contingent Item	Each	2.00	3,900.00	750.00	1,000.00	1,200.00	6,280.72	5,000.00

BID TABULATION

Project No. WS85500268-1

Description: 27th Ave/Roosevelt/31st Ave/Van Buren-1

Item No.	Description	Unit	Quantity	Engineer's Unit Price	WGC, Inc.	PIERSON CONSTRUCTI CORPORATIO	J Wise Corp	TALIS CONSTRUCTIO	B & F Contracting, Inc.
33 M6303012	12" Valve, Box and Cover, Furnish & Install	Each	4.00	1,300.00	1,800.00	2,000.00	1,800.00	1,924.12	1,780.00
34 M6303106	6" Valve, Flg. X MJ, Box and Cover, Furnish & Install	Each	19.00	600.00	960.00	1,000.00	900.00	766.32	990.00
35 M6304015	6" X 6" Tapping Sleeve and Valve, Box & Cover, Furnish & Install	Each	31.00	1,800.00	1,789.00	2,650.00	2,500.00	2,942.10	2,900.00
36 M6304030	8" X 8" Tapping Sleeve and Valve, Box & Cover, Furnish & Install	Each	1.00	3,000.00	1,800.00	3,000.00	3,000.00	4,358.80	3,000.00
37 M6304055	12" X 6" Tapping Sleeve and Valve, Box & Cover, Furnish & Install	Each	2.00	2,400.00	1,900.00	4,500.00	3,300.00	4,828.80	3,200.00
38 M6304060	12" X 8" Tapping Sleeve and Valve, Box & Cover, Furnish & Install	Each	1.00	3,200.00	2,600.00	4,800.00	3,600.00	5,430.01	3,500.00
39 M6304070	12" X 12" Tapping Sleeve and Valve, Box & Cover, Furnish & Install	Each	2.00	3,500.00	3,300.00	6,000.00	4,800.00	6,952.13	4,700.00
40 M6309065	Debris Cap, Including Locator Coil, Install	Each	72.00	100.00	50.00	125.00	90.00	103.45	110.00
TOTALS FOR: WS85500268-1 27th Ave/Roosevelt/31st Ave/Van Buren-1				1,599,135.50	1,689,956.25	1,999,645.00	2,046,612.10	2,221,759.76	2,293,373.00
GRAND TOTALS				1,599,135.50	1,689,956.25	1,999,645.00	2,046,612.10	2,221,759.76	2,293,373.00